

SOCIODEMOGRAPHIC AND SOCIOECONOMIC  
FACTORS RELATIONSHIP WITH DROWNING  
PREVENTION STRATEGIES

By

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Abstract: Lower income and disadvantaged communities habitually have a higher drowning fatality rate. These communities often do not have access to safe swimming educational tools such as swim lesson programs, CPR certification courses, and properly fitting lifejackets. This study explores the prefacing concepts that contribute to why these communities have a higher drowning rate. Utilizing a one-way ANOVA, this study surveyed the student population at Oklahoma State University and compared individual's access to various drowning prevention strategies in relation to their socioeconomic status.

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## CHAPTER I

### INTRODUCTION

#### **Introduction**

Swimming as a recreational activity that has been around for many centuries dating all the way back to 2500 BCE in Egypt (Tikkanen, n.d.). Up until World War I, swimming was used by the military to practice discipline. Swimming has even been used by engineers to better their understanding of floating and propelling devices. Many doctors began encouraging swimming to improve overall health (Pelayo et al., 2011). In the last 100 years, swimming has evolved from just a leisure sport into a competitive sport. The emergence of collegiate and professional swimmers stemmed from the sport's inclusion in the first ever Olympics Games in 1896 (Tikkanen, n.d.).

With the rise of swimming as both a recreational activity and a sport, came a rise in drowning fatalities. The Red Cross was developed in 1881 to aid in disaster relief efforts, however in 1914, Wilbert E. Longfellow spearheaded the first ever water safety program and Red Cross Life Saving Corps (American Red Cross, 2021). The program grew over the years and became recognized for its curriculum and attention to increased drowning rates. Since its establishment, the American Red Cross has certified over 14 million lifeguards and 1.5 million Water Safety Instructors (American Red Cross, 2021).

Over the years, Red Cross' science-based research has led to suggested practices and standards for Aquatics Professionals. This led to the establishment of the Circle Of Drowning Prevention, a set of five suggestions to reduce drowning fatalities: (1) provide close and constant attention to children you are supervising in or near water; (2) fence pools and spas with adequate barriers including four-sided fencing; (3) learn swimming and water-safety survival skills; (4) children, inexperienced swimmers, and all boaters should wear U.S. Coast Guard-approved life jackets; (5) always swim in a lifeguarded area (American Red Cross, 2020). These practices laid the foundation for suggested drowning prevention strategies from other organizations across the globe.

### **Statement of the Problem**

Many studies indicate that lower income areas traditionally house minority groups, and that these communities habitually have a higher drowning fatality rate. However, these studies fail to explore what access these lower income communities have to various drowning prevention tactics. Drowning death codes do not include extensive information that differentiates between preventative factors such as the victims swimming knowledge and skills, presence of adequate supervision (adult swimmer and/or lifeguard), and/or bystander cardiopulmonary resuscitation implementation. Understanding drowning victim's access to these preventative strategies as a whole could provide targeted prevention programs in communities with high drowning rates.

## **Purpose of the Study**

The purpose of this study is to understand what drowning prevention tactics are available to lower income and/or less educated communities in a comprehensive manner, rather than just a select few drowning prevention tactics. A notable collection of other research studies explains why these populations cannot or do not participate in swim lesson programs, however a significant gap in the research is the exploration of these population's access to other drowning prevention tactics such as access to a swimming pool with trained lifeguards on duty, access to a pool with physical barrier versus natural and open swimming pool, and access to CPR training and certification courses. This study aims to fill these aforementioned gaps in drowning prevention research.

## **Hypotheses**

This research tested five hypotheses;

*Null Hypothesis 1: There is no statistically significant difference between one of more sociodemographic groups (A, B, C, D) in access to the drowning prevention strategy of access to CPR certification training.*

*Hypothesis 1: There is a statistically significant difference between one or more sociodemographic groups (A, B, C, D) in access to the drowning prevention strategy of access to CPR certification training.*

*Null Hypothesis 2: There is no statistically significant difference between one or more sociodemographic groups (A, B, C, D) in access to the drowning prevention strategy of "use of" properly fitted life jackets or PFD's.*

*Hypothesis 2:* There is a statistically significant difference between one or more sociodemographic groups (A, B, C, D) in access to the drowning prevention strategy of “use of” properly fitted life jackets or PFD’s.

*Null Hypothesis 3:* There is no statistically significant difference between one or more sociodemographic groups (A, B, C, D) in access to the drowning prevention strategy of active supervision of an adult swimmer.

*Hypothesis 3:* There is a statistically significant difference between one or more sociodemographic groups (A, B, C, D) in access to the drowning prevention strategy of active supervision of an adult swimmer.

*Null Hypothesis 4:* There is no statistically significant difference between one or more sociodemographic groups (A, B, C, D) in access to the drowning prevention strategy of lessons in basic swimming skills.

*Hypothesis 4:* There is a statistically significant difference between one or more sociodemographic groups (A, B, C, D) in access to the drowning prevention strategy of lessons in basic swimming skills.

*Null Hypothesis 5:* There is no statistically significant difference between one or more sociodemographic groups (A, B, C, D) in access to the drowning prevention strategy of having barriers (fencing, gates, etc.) surrounding the pool area.

*Hypothesis 5:* There is a statistically significant difference between one or more sociodemographic groups (A, B, C, D) in access to the drowning prevention strategy of having barriers (fencing, gates, etc.) surrounding the pool area.

### **Significance of Study**

The data in this research study was collected from undergraduate and graduate students (ages 18 and older) at Oklahoma State University, however the findings and subsequent implications from this study can be applied to many diverse populations and public health issues. The information in this study should be fairly consistent and generalizable throughout any community, even those that differ in socioeconomic characteristics from the Oklahoma State University campus and surrounding community. The data presented in this report may be beneficial to many groups of people.

*Aquatic Practitioners* - The results of this study will allow Aquatic Practitioners to better understand the needs of the swimming population in their respective communities. It is crucial for those who are leaders in the Aquatic industry to not only be knowledgeable on the barriers within some communities around pools, but to be able to provide solutions to those affected by these barriers. Through this research study, Aquatics Practitioners may be able to better understand the needs of these groups and be able to better target these minority groups through

specialized programs such as free lifejacket rentals or discounted swim lesson packages to those who identify as being a member of a sociodemographic group.

*Non-Swimmers and/or Parents/Guardians of non-swimmers* - Another population that may benefit from this research study are non-swimmer and/or parents/guardians of non-swimmers. Many individuals in this category may not be aware of their sociodemographic barriers that are affecting their participation in swimming related activities. By educating this population on these drowning prevention strategies, they might choose to seek out opportunities that they had not done prior to the findings, such as participating in a CPR course.

*Policy Makers and Government Leaders* - The last population to find this study significant may be policy makers and government leaders who have potential to implement state-wide or nation-wide swimming safety standards that could minimize drowning deaths. Given that these challenges surrounding minority group swimming participation are not currently made a priority by policy makers, this research study could help these leaders further their understanding of how these issues are affecting several diverse communities daily. This research study can help bring attention to the identified sociodemographic disparities within access to drowning prevention strategies and encourage policymakers to enforce stricter safety standards around all bodies of water.

## **Definition of Terms**

*Cardiopulmonary Resuscitation (CPR)*: “is an emergency lifesaving procedure performed when the heart stops beating. Immediate CPR can double or triple chances of survival after cardiac arrest.” (American Heart Association, n.d.).

*Social Learning Theory (SLT)*: “the general view that learning is largely or wholly due to modeling, imitation, and other social interactions” (American Psychological Association, n.d.).

*Drowning*: “process of experiencing respiratory impairment from submersion/immersion in a liquid medium” (McCall & Sternard, 2021).

*Fatal Drowning*: “death caused by submersion in or the inhalation of water causing the victim to suffocate” (American College of Osteopathic Emergency Physicians, 2018).

*Adequate Supervision*: “Having constant visual contact, being within arm’s reach of any non swimmer and/or child under 5, not being distracted by conversation or a mobile phone, avoiding alcohol, being constantly ready to respond” (Carlile Swimming, n.d.).

*Sociodemographic Groups*: Four groups based on sociodemographic factors - race/ethnicity, household income, and parent/caregiver education level.

*Epidemiology*: “the study of the distribution and determinants of health-related states or events in specified populations, and the application of this study to the control of health problems” (Centers for Disease Control and Prevention, 2012).

## **Assumptions and Limitations**

This study assumed that all respondents understood the questions being asked, and that respondents read each item carefully before fully responding. It was also assumed that respondents answered survey questions openly and honestly. There are several limitations of this study that are necessary to note. Possible limitations of this study include the following:

1. **Sample Population Generalizations:** Due to the use of convenience and snowball sampling, the generalizations of the results of this survey might not be reflective of all populations.
2. **Self-reporting of swimming ability:** Participants are asked to self-report their swimming ability. The responses to this are subjective to the respondent and are not verifiable.
3. **Intentional drowning versus unintentional drowning:** There are several instances (i.e., suicide or homicide) in which there are several other factors that contribute to the fatality in addition to the five drowning prevention strategies outlined in this study. These discrepancies may also affect the generalizability of this study's findings.



## CHAPTER II

### REVIEW OF THE LITERATURE

#### **Social Learning Theory**

Social Learning Theory, introduced by psychologist Albert Bandura in 1977, suggests that people learn by observing other people that they believe to be credible sources. Social Learning Theory also postulates that reinforced behavior tends to be repeated, and learning is influenced by a person's self-efficacy. Self-efficacy is known as that individual's belief that they are capable of successfully learning knowledge and skills (Gregg, U., 2019).

Social Learning Theory has four processes that help explain why/how a new skill or behavior is adopted: *attention*, *retention*, *reproduction*, and *motivation*. Bandura also suggests that rewards and punishments are studied by the learner, and if the learner perceives that the reward is greater than the punishment, the behavior or skill from the model will be imitated (2U Inc., 2020). In relation to this study, a model will more often than not be a child's parent or caregiver.

The first process, *attention*, explains that individuals cannot learn a behavior or skill unless the individual is aware of its importance (2U Inc., 2020). An example of this is when a parent/caregiver does or does not educate their child of the importance of water safety. When a child jumps into a deep pool and is unable to extricate themselves,

resulting in them needing to be rescued by a lifeguard, could cause their parent/caregiver to want to explain to that child why it is necessary for weak swimmers to wear lifejackets around pools. The parent has then discussed the importance of water safety, henceforth that child now understands going forward why they need to wear their lifejacket when swimming in a deep area of a pool. The child did not previously wear a lifejacket because their parent/caregiver did not bring attention to the subject formerly.

The second process in Social Learning Theory is *retention*. While a behavior or skill might have already been brought to the learner's attention, they have not yet formed a memory of the behavior or skills. Retention is a vital component to the learning process (2U Inc., 2020). Using the same lifejacket example, this process could be reflective in a parent/caregiver simply reminding the child to put on their lifejacket each time they are going to be swimming or around a body of water. While the parent has already paid great attention to water safety, they must continuously reemphasize the importance of the lifejacket until it becomes a memory for the child.

*Reproduction* is the third process in Social Learning Theory. This can be explained as a learner's physical ability to imitate a skill or behavior from their model (2U Inc., 2020). For example, if a child observes their parent or caregiver swimming, the child might have an interest in swimming as well, however they believe that they are not physically capable of imitating the skill. It is at this step that a parent could then enroll their child in formal swim lessons and/or teach the child swimming skills themselves to then learn how to imitate the model's skill. Neglecting this step in the learning process could lead to build up fears and reservations towards swimming. Likewise, if a parent has a fear of swimming, this can be mirrored on the child. If a person has built up a fear, their self-

efficacy is likely low, and they may believe that participation in swim lessons will not help them learn to swim. Henceforth, this could result in the individual never learning how to swim.

The final process in Social Learning Theory is *motivation*. This process explains how individuals learn through observing the consequences of actions for other people, rather than through direct experience (2U Inc., 2020). For example, if a child witnesses a weak swimmer being rescued from the water because they were not wearing a lifejacket, the child now recognizes that drowning/needing to be rescued is a consequence of not wearing their lifejacket. Assuming the parent/caregiver has engaged in the other three components of Social Learning Theory, *attention, retention, and reproduction*, this experience may then motivate the child to always wear their lifejacket if they are a weak swimmer.

Social Learning Theory in conjunction with previous research shows that parents/caregivers can have a strong influence on whether or not a child participates in physical activities. Research shows that there is a positive association between parent-child physical activities. Children model the parent's physical behavior, meaning that if a parent swims regularly, it is highly likely that their child will also swim regularly. On the contrary, if a parent never engages in physical activity and/or the child never witnesses the parent doing so, it is probable that the child will not engage in physical activity; "Parents who model physical activity behaviors and encourage physical activity behaviors are more likely to have physically active children" (Pharr et al., 2014, p. 10).

This same idea of parents modeling behaviors for their children to repeat can be applied for almost all elements of water safety. For example, an adult modeling

appropriate use of lifejackets and wearing a lifejacket around water, the child is more likely to appropriately wear a lifejacket. This concept can also be mirrored in the overall level of swimming comfort. 65% of parents of at-risk swimmers are at-risk swimmers themselves. However, only 19% of parents of non-at-risk swimmers are considered at-risk swimmers themselves (Irwin et al., 2008). At the core, children's learned skills and behaviors around swimming is reflected directly by the parent's perception and behavior towards the matter.

### **The Haddon Matrix Paradigm**

In combination with Social Learning Theory, the Haddon Matrix Paradigm can provide context to the theory within drowning, drowning fatalities, and drowning prevention strategies. The Haddon Matrix was developed by William Haddon in 1970 to help identify injury intervention and prevention strategies from an epidemiological lens. The purpose of the Haddon Matrix is to help users think about environmental solutions to injuries and accidents, rather than relying exclusively on the behaviors and characteristics of the injured individual(s). This matrix helps users alter the environment to make the negative outcome of any incident less likely by enacting these different layers of protection. The Haddon Matrix recognizes that more layers of protection are necessary, as one single strategy might not successfully prevent injuries or fatalities (The Northwest Portland Area Indian Health Board, n.d.).

The Haddon Matrix, in its simplest form, is divided into four columns: *Host*, *Agent*, *Physical Environment*, and *Social Environment*; and three rows: *Pre-Event*, *Event*, and *Post-Event*. In its most complex form, there are additional secondary layers that are

at play during an event. These include *effectiveness, cost, free, equity, stigmatization, preferences, feasibility, and other identified criteria* (Runyan, 1999).

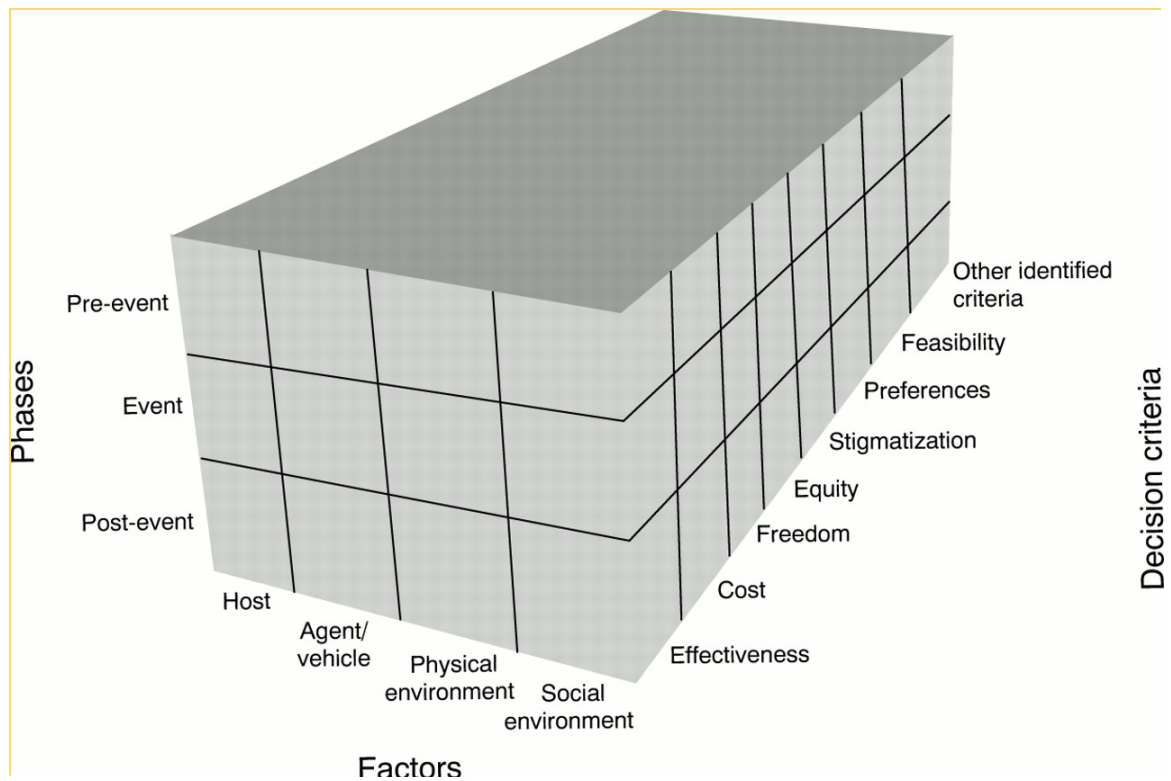


Figure 1

Illustration of three-dimensional Haddon Matrix Model (Runyan, 1999)

When understanding that drowning fatalities can be better prevented when multiple prevention strategies are implemented, it is important to note that proper public health policies and attention on the subject may also be needed. To understand how the Haddon Matrix is applicable to this study, the following chart has been adapted from a research study conducted through Seattle Children’s Hospital and Washington State Department of Health (Peden et al., 2008

Table 1 Using the Haddon Matrix to Define Risk Factors and Policy Strategies for Open Water Drowning in Washington State

Status	Host	Agent	Physical Environment	Social Environment
Pre-Event	Lack of adequate supervision	No life jacket available	No access to lifeguarded or regulated swim areas	Low adult use of lifejacket
	Lack of knowledge about drowning risks	Life jacket for swimming not allowed in pool	No lifeguard on duty when swimming in the area	Lack of supervision or childcare
	Lack of swimming lessons	Lack of lifeguards	Lack of barriers in the facility	Lack of fencing/barrier legislation
	Cultural norms/beliefs		Inadequate barriers blocking the area	Lack of water safety instruction and community awareness programs
	Socioeconomic status		Lack of warning signs in the area	Lack of agencies and programs to implement water safety programming
	Race/ethnicity barrier			
Event	Poor swimming ability	No life jacket being used by swimmer	No lifeguard in the swimming areas	Low adult use of lifejacket
	Not wearing a lifejacket	Life jacket being used by swimmer is not properly fitted		Poor access to information and resources for minimizing risk
	Rescuer unable to swim and/or lack of water survival skills Swimming alone			
Post-Event	Lack of survival skills		No lifeguards on available to respond to emergency	Low adult use of lifejacket
	Lack of CPR training		Distance between accident and emergency medical services (EMS)	
	Delay in rescue			
	Lack of knowledge by rescuer about what to do immediately			

Table 1 modified from Peden et al., 2008

## **Racial, Cultural, and Ethnic Disparities of Swimming Pool Access and Swimming Participation**

To further understand drowning rates specifically within sociodemographic groups, it may be important to note the inequalities in facility access for these populations. Minority populations are substantially underrepresented compared to their Caucasian counterparts in the swimming community. Lack of accessibility to aquatic facilities dates back to the 1920s when there was an increase in the building of large, resort-style pools in the United States. These pools were built primarily located in or near major urban and metropolitan cities. During this time of racial segregation and heightened violence, police notoriously would not stop Caucasian patrons from intimidating and violently removing of African American patrons from pools. Caucasian swimmers refused to swim in the same water as African American swimmers out of fear that they would be exposed to dirt or diseases spread through the shared water with these minority groups. Additionally, pools were/are considered to be incredibly intimate spaces, both based on physical proximity and visually. Because of this, Caucasian patrons did not want African American men to have viewing access to young, white, female swimmers in their revealing and tight-fitting swimsuits (Martin, 2008).

The latter part of segregation led to “white flight”, the fleeing of white families from these urban areas to wealthy, primarily Caucasian neighborhoods (Martin, 2008). This transition led to the building of private, at-home residential pools which subsequently limited the pool users to the white homeowners within that respective community. This limited access to municipal swimming pools is still reflective in the present day, which leaves poorer, inner-city communities with even less access to pools

than in the 1920s (Martin, 2008). In fact, according to the annual DDB Needham Lifestyles Survey almost three-fourths of African Americans indicated that they never participated in swimming while 60% of white respondents indicated participating in swimming at least once per year (Irwin et al., 2008).

Facility access is not the only limitation that prevents minority groups from engaging in aquatic related activities. For many minority groups, religious beliefs, gender roles and cultural norms can be constraints that make participation in swimming significantly more challenging than compared to majority groups. For example, African American females are a population that swimming participation is low. This low participation has been attributed to the constraints surrounding their hair care when it is wet, which inevitably impacts desire to swim (Norwood, 2010).

In the Islamic teachings, females are not restricted from participating in physical activities, however it can be the social barriers that largely impact this population from participation in sports. In most Muslim countries, women are expected to have their hair, neck, hands, and face covered when in public as a form of modesty. This is most commonly practiced by wearing a hijab, as well as long sleeves and skirts. Full body swimming attire has just recently made its emergence in the Western world, making swimming a very new option for physical activity for Muslim women. Muslim religious leaders have also noted that if men are watching the sport, they are to ensure that the female's movements do not sexually excite the male viewers (Malchrowicz-Mosko, E., 2021). These limitations can be important for aquatic practitioners and researchers to be aware of when studying minority group involvement in aquatic programs.



## **Racial Disparities in Drowning Rates**

In spite of some groups having less access physically or culturally to pools and swimming, drowning disproportionately affects those of racial and ethnic minority groups. A research study conducted by the Centers for Disease Control and Prevention (CDC) found that minority groups statistically reported a higher overall drowning rate than their majority group counterparts. The drowning rate for American Indians and Alaska Natives is twice the rate of Caucasians. African Americans ages 5-19 are 5.5 times more likely to drown than Caucasian individuals in the same age group. African Americans ages 11-12 are 10 times more likely to drown in swimming pools than Caucasians ages 11-12 (Gilchrist & Parker, 2014).

Additionally, swimming knowledge competence varies drastically by race and ethnicity. African American adults reportedly have the lowest level of swimming skills; 62% have limited or no swimming skills. On the contrary, Caucasian adults reported the highest level of swimming competency with only 32% of respondents reported having limited or no swimming skills (Pharr et al., 2014). This disparity is only one element that can impact water safety.

## **Elements at Play During a Drowning Fatality**

It is crucial for researchers to understand that race is not the only factor contributing to a drowning fatality. First and foremost, it is important to note that intentional drowning such as suicide or homicide does attribute to a significant portion of drowning rates. For the purpose of this study, only elements affecting unintentional drowning fatalities will be examined.

The first element that is at play during a drowning fatality is whether or not the incident occurred in a rural or urban setting. As discussed previously, the explosion of large, municipal pools in major metropolitan facilities in the 1920s still impacts swimming pool access today. Those who live in an urban area are more likely to live near a man-made swimming pool compared to those who live in a more rural area. 84% of drowning victims reportedly drowned in a rural setting, compared to only 16% of drowning victims who drowned in an urban setting (Tyler et al., 2017). Those who live in low-income, rural areas are more likely to swim in a natural body of water such as a lake, ocean, river or pond, which has its own set of safety concerns such as animals, currents, murky water, and natural obstacles (broken tree limbs, sharp rocks) (Tyler et al., 2017).

This leads to the second element, the size and type of body of water in which the drowning fatality occurred. Whether the body of water was a natural or man-made, whether it was a large or small body of water, and the depth of the water all impacts the likelihood of a drowning fatality occurring. Smaller bodies of water such as streams, ponds, and wells reportedly experience the most drowning events (Tyler et al., 2017).

Additionally, the time or day has a large impact on drowning rates. Not surprisingly, more drowning fatalities occurred during the day rather than at night because it is more popular to swim during the warmer, daytime hours, rather than at night. 95% of drowning events were reported to have occurred during the daytime (Tyler et al., 2017).

Gender also contributes to different drowning fatalities. Males traditionally “exhibit riskier behavior than their female counterparts and therefore expose themselves to more dangerous situations when around bodies of water” (Tyler et al., 2017, p. 4).

In addition to gender, the swimming ability of the swimmer plays a large part in their likelihood to become a drowning fatality victim. 86% of drowning victims reportedly had no swimming abilities, while 10% had some swimming abilities and 4% had an unknown level of swimming abilities. This percentage can be largely attributed to the lack of swim lesson programs available to all communities, especially in lower income communities where financial restrictions are a constraint in participation (Tyler et al., 2017).

Lastly, the presence or absence of adequate adult supervision while swimming can affect the outcome of a drowning accident. 76% of drowning accidents were reported to have children unsupervised at the time of the accident, while only 18% were supervised. With this percentage in mind, researchers know that the presence of adult supervision while swimming can reduce the likelihood of a drowning accident” (Tyler et al., 2017, p. 4). Additional factors can also play a role in a drowning fatality including the use of alcohol, the use of drugs or certain medications, and certain medical conditions such as individuals with autism or epilepsy (Centers for Disease Control and Prevention, 2021).

### **Recommended Drowning Prevention Strategies**

After considering what elements are actively at play during a drowning accident, it can be necessary to explore the implementation of prevention strategies to mitigate drowning rates. As previously discussed, each swimming location varies drastically based on location, body of water size and features, and accessibility to adequate supervision. Because of these differences and with the previously discussed Haddon Matrix Paradigm in mind, it is necessary to implement multiple “*layers of protection*”, or prevention

strategies, to best limit the number of drowning accidents. According to a research study conducted by the CDC in 2014, recommended drowning prevention strategies includes the use of barriers surrounding the pool (i.e fencing or gates), the use of properly fitted life jackets or personal floatation devices, active supervision from an adult swimmer or lifeguard, teaching basic swimming skills, and bystander's ability to perform CPR (Gilchrist & Parker, 2014).

58% of drownings among children less than four years old occurred in their own home (American Academy of Pediatrics, 2020). One major factor in this statistic is due to unsupervised children wandering outside and falling into a swimming pool that was not properly protected, thus the first suggested drowning prevention strategy, the use of barriers surrounding the pool. Fencing surrounding a pool should be at least four feet tall and surround all four sides of the facility. The barriers are suggested to be self-closing and self-latching (Denny et al., 2019). Similarly, the American Academy of Pediatrics Committee on Injury and Poison Prevention claimed that “increased adult supervision, the use of personal floatation devices, instruction in basic life support, and efforts to enclose swimming pools can significantly reduce incidences of child submersion injuries and death” (Hastings et al., 2006, p. 895).

### **Association of Income and Swimming Education Level (Epidemiology)**

It is nearly impossible to fully study drowning elements holistically without examining the correlation between income and health, known as epidemiology. Epidemiology is the study of the distribution and determinants of health-related states or events in specified populations, and the application of this study to the control of health problems (Centers for Disease Control and Prevention, 2012). Drowning and the issues

and events surrounding drowning fatalities do not have regulations to mandate many, if any, drowning prevention strategies. There are currently no state-wide or nation-wide regulations for basic safety requirements that mandate the presence of certified lifeguards and other commonly recognized drowning prevention strategies (Denny et al., 2019). Drowning is an underrecognized and neglected health hazard given its high mortality amongst several diverse populations. Drowning claims the lives of over 372,000 individuals annually across the world, with over 90% of those deaths occurring in low- and middle-income countries. The analysis of drowning prevention strategies can be commonly linked to other public health issues such as ensuring safe water supply to all, disaster risk management (i.e., natural disasters such as flooding, hurricanes, tsunamis, etc.), and child health (World Health Organization, 2014).

According to a research study conducted by the University of Memphis for USA Swimming in 2008, there is a strong correlation between respondents' level of education and their overall participation and comfort level towards swimming. The study utilized survey questions regarding if the child qualified for a free lunch program at their school in order to determine a families' household income. Using this information, the study found that swimmers who live in a household that qualifies for a school free lunch program were more likely to have a lower swimming ability and more likely to express a fear of drowning. On the contrary, as income increased, so did the respondent's swimming ability and comfort level (Irwin et al., 2008).

This direct correlation between income and swimming comfort is not a coincidence. Those who are economically disadvantaged are significantly more likely to be an at-risk swimmer. This can be attributed to lack of targeted initiatives towards these

marginalized groups. The lack of support for safe swimming instructional programs is reflected in the U.S drowning fatality rate. In fact, countries that have a mandated swimming curriculum for children have a drastically lower drowning rate. The UK for example, has a strong alliance between schools and aquatic facilities to provide swimming instruction for all. The Swim England program is a nation-wide swimming curriculum that ensures all primary school students learn the importance of water competency. The program centers around three goals: (1) perform safe self-rescue in different water-based situations, (2) swim competently, confidently, and proficiently over a distance of 25 meters, and (3) use a range of strokes effectively (Swim England, n.d.). Because of successful and specific targeted programs such as Swim England, the drowning fatality rate in the UK is 0.6 per 100,000 individuals. That is half of the USA drowning fatality rate, which sits at 1.3 per 100,000 (Irwin et al., 2009).

“Providing children with opportunities to engage in regular swimming can demand greater time from parents (e.g., supervision or attention, transportation to swimming facilities) as well as financial resources (e.g., tuition/coaching fee), both of which have been shown to be associated with socioeconomic status and education levels” (Chan et al., 2020). Nation-wide available and practiced curriculum may be providing those who might not have easy access to private swim lessons exposure to even the simplest form of water safety knowledge without taking a financial and logistical toll on the parents of the child.

## CHAPTER III

### METHODOLOGY

#### **Instrument**

Using a modified questionnaire from a study conducted at the University of Memphis in 2008 (29 Swimming Involvement Survey), this research study examined what access diverse sociodemographic groups have to different drowning prevention. The initial instrument was created to explore what factors influence swimming participation among underrepresented communities. The initial questionnaire used a panel of adolescent studies specialists and Aquatics industry experts to review the survey instrument to determine that the instrument had both content and face validity. The research team then used a pilot sample of 100 respondents to determine the reliability which was found to be .80. The questionnaire utilized a variety of question types including a 4-point Likert-scale where respondents were asked to rank their agreement or disagreement to various statements. Several “yes”, “no” or “don’t know” questions were utilized, as well as several multiple-choice questions and a few open-ended questions. The initial questionnaire was intended for underrepresented adolescents ages 6 to 16 who reside in metropolitan communities, so the language has been adapted to be suitable for the Oklahoma State University student population.

Four questions regarding CPR education and facility access were added to ensure full data necessary to conduct the hypothesis testing. No questions were omitted on the modified questionnaire, however some questions were not used in the analysis of the data, as they were not pertinent to this research study. Given the initial instrument's high level of reliability, these minor revisions to the adapted instrument should still yield a high validity percentage.

### **Selection of Participants**

The population studied were currently enrolled students at Oklahoma State University. The OSU student body was the selected population, aside from overall convenience and accessibility, due to its representation of all 50 United States and over 100 countries (Oklahoma State University, 2018). The findings from this study could potentially be generalizable because of the diverse population.

The data from this research study was collected from undergraduate and graduate students (ages 18 and older) at Oklahoma State University (OSU) through convenience and snowball sampling. Convenience sampling is when individuals used as the survey participants are easily accessible to the researcher (Zhou & Sloan, 2015). In the case of this study, the convenience sample was students who are currently enrolled in courses through the College of Education and Human Sciences at OSU, Department of Wellness (DOW) student staff, as well as participants in Department of Wellness events and programs. Contact lists were obtained from the Assistant Director of Operations at the Department of Wellness to receive email addresses of those who attend DOW events and programs. The initial survey recipients were encouraged to then pass along the survey as



a means of snowball sampling. Snowball sampling is when survey respondents introduce the researcher to other potential participants (Zhou & Sloan, 2015). It was determined that respondents from all racial and ethnic backgrounds were needed to accurately showcase the disparities between minority and majority groups.

### **Distribution of Survey**

The modified questionnaire was administered using Qualtrics and distributed through the Sona System at Oklahoma State University and direct emails. Upon completion of the survey, respondents were asked to share the survey link with their peers and fellow students as an act of snowball sampling. A script was given to all participants to use when sharing the survey with their peers (see Appendix A). After an expedited review and approval by the Oklahoma State University Institutional Review Board, data collection began on April 5. Data collection was set to continue until April 18, unless fewer than 100 usable responses are received. If 100 usable responses are not received, data collection will continue until 100 usable responses are received or until April 30. The sample size of 100 respondents for the survey was selected to mirror similar studies conducted at OSU (Powell, 2019).

### **Description of Participants**

The researcher began by dividing all respondents into four different groups based on their sociodemographic characteristics: (1) race/ethnicity, (2) household income, and (3) parent/caregiver education level. The characteristics are defined below:

*Race/Ethnicity:* Respondent identifies as any race/ethnicity other than “White”.

*Household Income:* Respondent was on reduced/free lunch as a child and/or currently receives complete or partial financial aid

*Parent/Caregiver Education Level:* Respondent’s parent/caregiver had only “some high school” or “high school diploma or GED”.

Group A will be any respondent who fits into all three demographic categories.

Group B will be any respondent who fits into any two of the demographic categories.

Group C will be any respondent who fits into any one of the demographic categories, and

Group D will be respondents who do not fit into any of the demographic categories.

Participation in a reduced or free lunch program and/or are on partial or complete financial aid were variables used to differentiate whether or not a person is in a minority or majority group. Based on income, for the average US family of four in the 2021-2022 academic school year, the annual income eligibility is \$34,450 to qualify for free lunches and \$49,025 for reduced cost lunches. The poverty level for the same sized family is \$26,500 (U.S. Department of Agriculture, 2021). Similarly, financial aid status can be a variable for determining if an individual is in a minority group. According to the National Center for Education Statistics, “88 percent of Black students, 87 percent of American Indian/Alaska Native students, and 82 percent of Hispanic students received grants in 2015–16. These percentages were higher than the percentages for White (74 percent) and Asian (66 percent) students” (National Center for Educational Statistics, 2019).

## **Analysis of the Data**

The data collected from the questionnaire was entered into Statistical Package for the Social Sciences (SPSS). Given the sample size and convenience sample population rather than a random sample, nonparametric analysis tests were run. Several one-way ANOVA tests were run to compare the different elements of drowning prevention strategies with each of the sociodemographic groups. Statistics of central tendencies were also run to determine mean, median, mode, and standard deviation on respondent's age.

## CHAPTER IV

### FINDINGS

#### **Overview**

This study examined if various sociodemographic groups had varied access to drowning prevention strategies. Furthermore, the data was collected beginning April 5 and concluded on April 18. Responses that indicated survey abandonment or where not filled out entirely were omitted. Additionally, due to the nature of the survey, responses were omitted if the researcher was unable to identify the respondents sociodemographic group. In total, four responses were omitted which left a remaining 106 usable responses. Two responses were omitted for incomplete questionnaires, while two responses were omitted due to inability to identify the respondents sociodemographic group.

#### **Demographics**

The mean reported age for the respondents was 21.7727. The mode was 20.00 and the median was 21.00. Of the usable 106 responses, only 88 of respondents marked their age. Of those 88 responses, 26 identified as male, 79 identified as female, and 1 preferred to not share their gender identity. 9 individuals (8.5%) were in sociodemographic group A, 22 people were in sociodemographic group B (20.8%), 49 were in sociodemographic group C (46.2%), and 26 (24.5%) were in sociodemographic group D.

Sociodemographic Group	n = 106
A	9
B	22
C	49
D	26
Gender	
Male	26
Female	79
Prefer not to say	1

### Scoring

Survey responses were scored before being imputed into SPSS. Scoring was conducted using a traditional Likert-scale scoring system where “strongly disagree” was scored as a “1”, “disagree” was scored as a “2”, “agree” was scored as a “3”, and “strongly agree” was scored as a “4”. Yes/no style questions were similarly scored where “yes” was scored as a “1”, “no” was scored as a “2”, and “don’t know” was scored as a “0”. Due to the nature and verbiage of some survey questions, scoring was inverted if the question was asked in an negative way (i.e. “For the following questions, reflect on your swimming beliefs and skills as a child. - Our family budget does not include money for me to take swimming lessons”). After the initial scoring process, questions were then categorized based on which hypothesis was being answered. After questions were grouped together, scoring was totaled up to create one number per hypothesis, meaning all questions pertaining to each drowning prevention strategy were combined to give one overall number. This number is considered the amount of access each respondent had to that particular drowning prevention strategy.

Sociodemographic groups were also scored to make for easier SPSS conversion. Those who fit into sociodemographic group A, were scored as a “1”. Sociodemographic group B was scored as a “2”. Sociodemographic group C was scored as a “3”, and sociodemographic group D was scored as a “4”.

**Hypothesis 1**

The first null hypothesis tested was: there is no statistically significant difference between one of more sociodemographic groups (A, B, C, D) in access to the drowning prevention strategy of access to CPR certification training. To test this hypothesis, a one-way ANOVA was used to determine if there was a statistically significant difference between any of the groups. Sociodemographic group A reported a mean score of 3.4444. Sociodemographic group B reported a mean score of 4.9545. Sociodemographic group C reported a mean score of 4.6735, and sociodemographic group D reported a mean score of 4.6923.

Table 3 CPR Certification Training by Sociodemographic Group

	n = 106	Average level of access to CPR Certification Training	Standard Deviation
Sociodemographic Group A	9	3.4444	1.87824
Sociodemographic Group B	22	4.9545	0.99892
Sociodemographic Group C	49	4.6735	1.32897
Sociodemographic Group D	26	4.6923	1.15825

The Test of Homogeneity Variances indicated that there was a statistically significant overall difference between groups. The p-value between groups is 0.031. Because the p-

value is less than .05, the null hypothesis is rejected and can conclude that there is a statistically significant difference between one or more sociodemographic groups (A, B, C, or D) in access to the drowning prevention strategy of CPR certification training.

**Hypothesis 2**

The second null hypothesis tested was: there is no statistically significant difference between one or more sociodemographic groups (A, B, C, D) in access to the drowning prevention strategy of “use of” properly fitted life jackets or PFD’s. To test this hypothesis, a one-way ANOVA was used to determine if there was a statistically significant difference between any of the groups. Sociodemographic group A reported a mean score of 2.3333. Sociodemographic group B reported a mean score of 2.7727. Sociodemographic group C reported a mean score of 2.7755, and sociodemographic group D reported a mean score of 3.0000.

Table 4 Equipment Access by Sociodemographic Group

	n = 106	Average level of equipment access	Standard Deviation
Sociodemographic Group A	9	2.3333	.86603
Sociodemographic Group B	22	2.7727	.92231
Sociodemographic Group C	49	2.7755	.87238
Sociodemographic Group D	26	3.0000	.69282

The p-value between groups is 0.239. Because the p-value is greater than .05, the null hypothesis is accepted and can conclude that there is not a statistically significant

difference between one or more sociodemographic groups (A, B, C, or D) in access to the drowning prevention strategy of properly fitted lifejackets.

### Hypothesis 3

The third null hypothesis tested was: there is no statistically significant difference between one or more sociodemographic groups (A, B, C, D) in access to the drowning prevention strategy of active supervision of an adult swimmer. To test this hypothesis, a one-way ANOVA was used to determine if there was a statistically significant difference between any of the groups. Sociodemographic group A reported a mean score of 12.6667. Sociodemographic group B reported a mean score of 13.0455. Sociodemographic group C reported a mean score of 13.4286, and sociodemographic group D reported a mean score of 13.6923.

Table 5 Adequate Adult Supervision by Sociodemographic Group

	n = 106	Average level of access to Adequate Adult Supervision	Standard Deviation
Sociodemographic Group A	9	12.6667	2.59808
Sociodemographic Group B	22	13.0455	2.33966
Sociodemographic Group C	49	13.4286	1.95789
Sociodemographic Group D	26	13.6923	2.03508

The p-value between groups is 0.546. Because the p-value is greater than .05, the null hypothesis is accepted and can conclude that there is no statistically significant



difference between one or more sociodemographic groups (A, B, C, or D) in access to the drowning prevention strategy of adequate adult supervision.

#### Hypothesis 4

The fourth null hypothesis test was: there is no statistically significant difference between one or more sociodemographic groups (A, B, C, D) in access to the drowning prevention strategy of lessons in basic swimming skills. To test this hypothesis, a one-way ANOVA was used to determine if there was a statistically significant difference between any of the groups. Sociodemographic group A reported a mean score of 37.2222. Sociodemographic group B reported a mean score of 41.9545. Sociodemographic group C reported a mean score of 42.4694, and sociodemographic group D reported a mean score of 42.8846.

Table 6 Lessons in Basic Swimming Skills by Sociodemographic Group

	n = 106	Average level of access to Basic Swimming Skills	Standard Deviation
Sociodemographic Group A	9	37.2222	5.84760
Sociodemographic Group B	22	41.9545	5.76093
Sociodemographic Group C	49	42.4694	5.51929
Sociodemographic Group D	26	42.8846	4.08242

The Test of Homogeneity Variances indicated that there was a statistically significant overall difference between groups. The p-value between groups is 0.043. Because the p-value is less than .05, the null hypothesis is rejected and can conclude that there is a statistically significant difference between one or more sociodemographic

groups (A, B, C, or D) in access to the drowning prevention strategy of lessons in basic swimming skills.

### **Hypothesis 5**

The fifth null hypothesis test was: there is no statistically significant difference between one or more sociodemographic groups (A, B, C, D) in access to the drowning prevention strategy of having barriers (fencing, gates, etc.) surrounding the pool area. To test this hypothesis, a one-way ANOVA was used to determine if there was a statistically significant difference between any of the groups. Sociodemographic group A reported a mean score of 17.444. Sociodemographic group B reported a mean score of 19.0909. Sociodemographic group C reported a mean score of 19.3469, and sociodemographic group D reported a mean score of 20.1154.

The p-value between groups is 0.059. Because the p-value is greater than .05, the null hypothesis is accepted and can conclude that there is no statistically significant difference between one or more sociodemographic groups (A, B, C, or D) in access to the drowning prevention strategy of in having barriers (fencing, gates, etc.) surrounding the pool area. Additionally, because the p-value is close to .05, it is important to note that in some instances and populations, there may be a statistically significant difference in access to having barriers (fencing, gates, etc.). The sample size and population of the data could have contributed to this close of a p-value.

Table 7 Facility Access by Sociodemographic Group

	n = 106	Average level of Facility Access	Standard Deviation
Sociodemographic Group A	9	17.4444	3.28295
Sociodemographic Group B	22	19.0909	2.63509
Sociodemographic Group C	49	19.3469	2.76549
Sociodemographic Group D	26	20.1154	1.50537

## Conclusion

To compare the means of the varied access to drowning prevention strategies between sociodemographic groups, one-way ANOVA tests were conducted for each hypothesis. The first null hypothesis states that there is no statistically significant difference between one of more sociodemographic groups (A, B, C, D) in access to the drowning prevention strategy of access to CPR certification training. After computing a one-way ANOVA, the results suggest that there is a statistically significant difference in the amount of access various sociodemographic groups have to CPR education courses and training. The second null hypothesis states that there is no statistically significant difference between one or more sociodemographic groups (A, B, C, D) in access to the drowning prevention strategy of “use of” properly fitted life jackets or PFD’s. After conducting a one-way ANOVA, the results suggest that there is no statistically significant difference in the amount of access various sociodemographic groups have to properly fitted life jackets. The third null hypothesis states there is no statistically significant difference between one or more sociodemographic groups (A, B, C, D) in access to the drowning prevention strategy of active supervision of an adult swimmer. Upon conducting a one-way ANOVA, the results conclude that there was no statistically

significant difference in the amount of access various sociodemographic groups have to active supervision of an adult swimmer. The fourth null hypothesis states there is no statistically significant difference between one or more sociodemographic groups (A, B, C, D) in access to the drowning prevention strategy of lessons in basic swimming skills. After conducting a one-way ANOVA, the results suggest that there is a statistically significant difference in the amount of access various sociodemographic groups have to lessons in basic swimming skills. The fifth null hypothesis states that there is no statistically significant difference between one or more sociodemographic groups (A, B, C, D) in access to the drowning prevention strategy of having barriers (fencing, gates, etc.) surrounding the pool area. The results from the one-way ANOVA conducted suggest that there is no statistically significant difference in the amount of access various sociodemographic groups have to having barriers surrounding the pool area.

## CHAPTER V

### CONCLUSION

#### **Introduction**

The understanding of minority group populations' involvement within aquatics facilities and their subsequent programs has been a highly explored subject in the aquatics industry. Additionally, there is a significant body of literature that examines best practices for minimizing drowning fatalities through a combination of drowning prevention strategies. Previous studies fail to examine the level of access these populations have to these drowning prevention strategies. The purpose of this study was to determine how much access each of these groups have to the suggested drowning prevention strategies and then note any disparities within these findings.

#### **Implications**

The results from this study can be beneficial for many different populations including Aquatic practitioners, policy makers and government leaders, and individuals who engage in Aquatics based activities such as parents and guardians of young swimmers. By understanding the results of this survey, Aquatics practitioners can better examine if their programs and services are in the hands of those who need it the most. For example, with the findings of this research in mind, Aquatics practitioners can explore if

their facilities traditionally target participants from socioeconomic groups A, B, C, or D. Once they understand what populations they serve, they may need to assess if they are adequately providing drowning prevention strategies for those individuals. Due to the significant correlation between CPR education access and sociodemographic groups, providers may want to consider offering free or reduced CPR certifications to their community. Similarly, facilities that habitually offer these courses may not be properly recruiting course participants and can use this study to examine if their services are appropriately targeted to those who need it the most.

Additionally, policy makers and government leaders can holistically and comprehensively examine their current aquatics-based policies and regulations. Information found throughout this study may help policy makers understand how disadvantaged populations have unequal access to drowning prevention mechanisms compared to their advantaged population counterparts. Henceforth, these policy makers and government leaders may be able to mitigate some of these inequalities through supplemental government programs. For example, individuals who are currently on a free lunch program may be automatically enrolled into a reduced swim lesson program run through the school's physical education classes. By beginning programs like swim-based curriculum through a public school system, government leaders and policy makers need to have a complete understanding of the challenges minority swimming populations face. This is an essential component to ensuring all socioeconomically challenged communities are being given the resources they need to engage safely in and around aquatics facilities.

Lastly, the implications from this research can be beneficial for those who frequently engage in aquatics programs, are a parent/guardian of a nonswimmer, and/or

are a nonswimmer themselves. Individuals in these populations may find the information in this study as a means to seek out additional drowning prevention strategies. For example, this study shows that access to proper CPR education is a necessary component to preventing a drowning fatality. Additionally, findings from this research shows that members of socioeconomic group “A” have the least amount of access to these types of certification courses. By reading this study, members of the lower socioeconomic status groups may be motivated to prioritize this drawing prevention strategy and thus seek out these certification courses from a local or online provider.

### **Limitations**

One limitation of this study is the sample size and population used. Given the time constraint, the population was limited to those who were undergraduate and graduate students and Oklahoma State University through convenience and snowball sampling. This may cause the generalizations of the survey might not be reflective of all populations. Additionally, the survey was distributed online through Sona System at Oklahoma State University and direct email. This inevitably limited the survey population to those who had access to the internet through a desktop or mobile device. Habitually, those who are more socioeconomically disadvantaged may not have the ability to access the internet and participate in a survey online. This may have caused a skew in the sample population, as those who have frequent access to the internet are more than likely going to belong in socioeconomic group C or D.

Additionally, due to the nature of the survey population being students within the Oklahoma State University system, the findings of the study may allow the university to

draw conclusions about the needs of their student population in relation to the drowning prevention strategies. However, these conclusions may not be generalizable across all universities, as the characteristics of each student population tend to be vastly different from one another.

Another limitation of this study was that it relied on the respondent's ability to self-report their own swimming ability. The responses to this are subjective to the respondent and are not verifiable. Similarly, the respondent might not be fully aware of their own swimming ability so they may have reported a lower skill level than their actual skill level.

### **Future Research**

There are many ways to expand on or modify this study. First, the study may be replicated to other universities where their student population reflects similar characteristics to that of the Oklahoma State University population. Additionally, the study design could be mirrored off university campuses and tested in communities with many diverse populations living within a proximity such as in a large city. This would inevitably create a larger and more diverse sample size. Research could also be conducted to examine not only if there are differences between these socioeconomic groups, but what exactly is the cause of these differences. Future research could also lead to the more in-depth exploration of each drowning prevention strategy. For example, expanding on this research may consider weighing if private swim lessons are more accessible compared to group swim lessons.

Another potential for future research would be to conduct a similar study targeted towards non-swimmers only. The purpose of a study targeted exclusively for this



population could be to determine how likely these individuals are to engage in various drowning prevention strategies. If Aquatics practitioners are ensuring they are equally providing these drowning prevention style programs, they must also question if people even have interest in participating in such programs.

## **Conclusion**

This research noted that more socioeconomically challenged individuals have less access to CPR certification training and lessons in basic swimming skills. While this research found that there was no statistically significant difference between socioeconomic groups access to facilities with fencing and barriers, access to properly fitted life jackets, and adequate adult supervision, these are all considered to be valuable layers of protection when minimizing the potential of a drowning fatality.

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## APPENDICES

### **Invitation to Participate**

You are invited to be in a research study about Sociodemographic and socioeconomic factor's relationship with drowning prevention strategies by Shelby Wood, under the direction of Dr. Donna K. Lindenmeier, Oklahoma State University. Your participation in this research is voluntary. There is no penalty for refusal to participate, and you are free to withdraw your consent and participation in this project at any time.

If you agree to be in this study, we would ask you to do the following: Complete an online survey that will take approximately 10 minutes.

**Compensation:** Participants who complete this study via the SONA system will receive 0.5 SONA credits. Participants who do not complete this study via the SONA system will receive no compensation for their participation.

**Confidentiality:** The information you give in this study will be anonymous. This means that your name will not be collected or linked to the data in any way. The data from this study will be stored in a password protected computer indefinitely. The research team will ensure anonymity to the degree permitted by technology. Your participation in this online survey involves risks similar to a person's everyday use of the internet. If you have concerns, you should consult the survey provider privacy policy at <http://www.qualtrics.com/privacy-statement/>.

**Contacts and questions:** If you have questions about the research study itself, please contact Shelby Wood, the Principal Investigator at (281)979-4902, [shelby.wood@okstate.edu](mailto:shelby.wood@okstate.edu). If you have questions about your rights as a research volunteer, please contact the OSU IRB office at 405-744-3377, [irb@okstate.edu](mailto:irb@okstate.edu)



By clicking "I Agree", you acknowledge:

- You are an undergraduate or graduate student at Oklahoma State University;
- Your participation in the study is voluntary;
- You are at least 18 years of age; and
- You are aware that you may choose to terminate your participation at any time for any reason.

If you agree to participate in this research, please click "I Agree" to continue.

- I Agree
- I Disagree

## Survey

For the following questions, reflect on your swimming beliefs and skills as a child.

	Strongly Disagree	Disagree	Agree	Strongly Agree
Swimming is an activity that I enjoy doing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I could be a successful swimming athlete if I were on a team	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I don't like how I look in a swimsuit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am concerned about getting injured when I swim	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Our family budget does not include money for me to take swimming lessons	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My parents/caregivers know how to swim	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There is a pool/swimming site close to where I live	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Swimming equipment is expensive (like a swimsuit or goggles)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I would like to swim more than I do now	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I don't swim much because I am so concerned about drowning	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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For the following questions, reflect on your swimming beliefs and skills as a child.

	Strongly Disagree	Disagree	Agree	Strongly Agree
My parents/caregivers encourage me to swim	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It costs a lot of money to swim	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I don't like how I look in a swimsuit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am not physically fit which affects my ability to swim	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My family does not have enough money for me to be on a swimming team	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I know about how to be safe around water	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Most members of my family know how to swim	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am able to get to a nearby pool/swimming site	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can swim in deep water using a regular stroke (not dog paddle) without stopping	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I swim with members of my family	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

For the following questions, reflect on your swimming beliefs and skills as a child.

	Strongly Disagree	Disagree	Agree	Strongly Agree
I do not like to get my hair wet when I swim	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My best friends like to swim	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I follow water safety rules when I swim	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I would rather participate in other sports than swimming	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am nervous when I swim	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My best friends are good swimmers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I would swim by myself if my friends decided to do something else	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel welcome at swimming pools	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I would like to improve my swimming skills	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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When responding to the following items, think about the pool or swimming site (lake, beach) nearest to where you lived as a child in which you could or would go swimming:

	Strongly Disagree	Disagree	Agree	Strongly Agree
The nearest pool/swimming site is open all year	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The nearest pool/swimming site is in good condition	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel safe at that pool/swimming site	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It is easy for me to get to that pool/swimming site	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I do NOT feel safe at that pool/swimming site when certain people are there	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I do NOT feel safe going to that pool/swimming site from home by myself	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The pool/swimming site closest to my home has barriers/fencing surrounding it	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Which of the following best describes the area the nearest pool/swimming site was in?

- Rural area
- Urban area
- Unknown

Which of the following were you likely to swim in while growing up?

- Private/residential pool
- Municipal/community pool
- Lakes
- Oceans
- Rivers/Streams
- Ponds
- Wells
- Other

When responding to the following items, think about the CPR educational opportunities nearest to where you lived as a child:

	Yes	No	Don't Know
I know how to preform CPR/give lifesaving care to someone	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel comfortable performing CPR/give lifesaving care to someone	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
While growing up, I knew of / heard of CPR courses in my neighborhood / community	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Which statement best describes your highest level of swimming ability as a child— (front crawl stroke is also called the freestyle stroke-face in water, breathing every other stroke)?

- Cannot swim at all
- Can splash around- shallow end
- Can put face in water- blow bubbles
- Can hold head under water-5-10 sec's
- Can glide a little- face in water- shallow end only
- Can swim a little in the deep end-face in water- can float a little
- Can swim with a true front crawl stroke- 1 pool length - no stopping
- Can swim- front crawl stroke- 2 or 3 pool lengths- can tread water for 5-10 minutes
- Can swim 4 or more pool lengths- no stopping- know 3 or 4 different strokes
- Can swim many lengths without stopping- on a swim team or could be on a swim team

What is your age? \_\_\_\_\_

What is your gender?

- Male
- Female
- Non-binary / third gender
- Prefer not to say

Please circle the highest level of education earned by either parent/caregiver (that you know).

- Some high school
- High School Diploma or GED
- College or technical school degree
- Advanced college degree (Masters/Doctorate, etc.)
- Unknown

What is your race/ethnicity? (Select the best one that matches your identity—you may select more than one response if that best describes who you are)

- American Indian or Alaska Native
- Asian
- Black or African American
- Hispanic/Latino
- Native Hawaiian or Other Pacific Islander
- White
- Other \_\_\_\_\_

Which of the following is the most likely way for you to get to a swimming pool?

- Walk/Bike/Skateboard
- Drive self
- Ride with friend
- Ride with parent/other family/caregiver
- Public transportation/bus

Which of the following best describes your school lunch program as a child?

- I was on a free lunch program
- I was on a reduced cost lunch program
- I did not receive free or reduced lunches
- I do not know if I was on any free/reduced lunch program

Which of the following best describes your CURRENT financial aid status? (Receiving FASFA loans, grants, non-academic scholarships, etc.)

- I am currently on complete financial aid
- I am currently on partial financial aid
- I do not receive any financial aid
- I do not know if I am currently on complete/partial financial aid

Please describe the type of financial aid you receive. \_\_\_\_\_

How many times do you swim--- during the summer months? \_\_\_\_\_

How many times do you swim--- during the non-summer months? \_\_\_\_\_

Who taught you how to swim?

- I do NOT know how to swim
- Swimming instructor/Lifeguard
- Family member
- Friend
- Taught myself
- Don't know who taught me

I know of a famous, world-class (Olympic-level) swimmer

- Yes
- No

Write down this famous swimmer's name below if you can remember it \_\_\_\_\_

I consider this person to be a role model.

- Yes
- No

I know of a local, expert swimmer.

- Yes
- No

Write down this local, expert swimmer's name if you can remember it \_

I consider this person a role model.

- Yes
- No



I do NOT swim because of an injury or health problem.

- Yes
- No
- Sometimes

If “Yes” or “Sometimes,” please write down your injury or health problem (like asthma)

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On a scale of 1-10 with “10” being the best, rate your swimming ability. (circle only one)

	1	2	3	4	5	6	7	8	9	10
Swimming Ability	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

From the reasons below, please check (✓) the top three (3) reasons that may be keeping you from improving your swimming ability. For the reasons below, “chemicals” can be chlorine, salt, or other substances found in swimming pools, lakes, or ocean water.

- I am afraid of drowning
- My parents/caregivers are afraid that I will drown
- My parents/caregivers do not encourage me to swim
- I do not have enough money
- I do not have enough time
- I do not have transportation to get to a swimming pool/site
- There is not a safe pool facility near where I live
- The nearest pool facility is not a good one
- I do not feel accepted or welcome when I swim because of my size
- I do not feel accepted/welcome when I swim because of the color of my skin
- My friends do not like to swim
- I can't wear my contacts when I swim so I can't see
- Water and/or chemicals get into my nose/sinuses
- Water and/or chemicals mess up my hair
- Water and/or chemicals hurt my eyes
- Water and/or chemicals clog up my ears
- Water, sun and/or chemicals change/mess up my skin
- Water and/or chemicals ruin my make-up
- Other \_\_\_\_\_

We thank you for your time spent taking this survey. Your response has been recorded.

# Institutional Review Board Approval Letter



## Oklahoma State University Institutional Review Board

Date: 03/31/2022  
Application Number: IRB-22-148  
Proposal Title: Sociodemographic factor's relationship with drowning prevention strategies

Principal Investigator: Shelby Wood  
Co-Investigator(s):  
Faculty Adviser: Donna Lindenmeier  
Project Coordinator:  
Research Assistant(s):

Processed as: Exempt  
Exempt Category:

### Status Recommended by Reviewer(s): Approved

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The IRB application referenced above has been approved. It is the judgment of the reviewers that the rights and welfare of individuals who may be asked to participate in this study will be respected, and that the research will be conducted in a manner consistent with the IRB requirements as outlined in 45CFR46.

**This study meets criteria in the Revised Common Rule, as well as, one or more of the circumstances for which continuing review is not required. As Principal Investigator of this research, you will be required to submit a status report to the IRB triennially.**

The final versions of any recruitment, consent and assent documents bearing the IRB approval stamp are available for download from IRBManager. These are the versions that must be used during the study.

As Principal Investigator, it is your responsibility to do the following:

1. Conduct this study exactly as it has been approved. Any modifications to the research protocol must be approved by the IRB. Protocol modifications requiring approval may include changes to the title, PI, adviser, other research personnel, funding status or sponsor, subject population composition or size, recruitment, inclusion/exclusion criteria, research site, research procedures and consent/assent process or forms.
2. Submit a request for continuation if the study extends beyond the approval period. This continuation must receive IRB review and approval before the research can continue.
3. Report any unanticipated and/or adverse events to the IRB Office promptly.
4. Notify the IRB office when your research project is complete or when you are no longer affiliated with Oklahoma State University.

Please note that approved protocols are subject to monitoring by the IRB and that the IRB office has the authority to inspect research records associated with this protocol at any time. If you have questions about the IRB procedures or need any assistance from the Board, please contact the IRB Office at 405-744-3377 or [irb@okstate.edu](mailto:irb@okstate.edu).

Sincerely,  
Oklahoma State University IRB

VITA

Shelby Wood

Candidate for the Degree of

Master of Science

Thesis: SOCIODEMOGRAPHIC AND SOCIOECONOMIC FACTORS  
RELATIONSHIP WITH DROWNING PREVENTION STRATEGIES

Major Field: Leisure Studies

Biographical:

Education:

Completed the requirements for the Master of Science in Leisure Studies at Oklahoma State University, Stillwater, Oklahoma in July, 2022.

Completed the requirements for the Bachelor of Science in Integrated Marketing Communications at University of Mississippi, Oxford, Mississippi in 2020.

Experience:

Oklahoma State University: August 2020 – May 2022

University of South Carolina: June 2022 – present

Professional Memberships:

NIRSA: 2020 – present