

ABSTRACT

Title of thesis: FACTORS INFLUENCING CHILDHOOD SWIMMING
INSTRUCTION: EVALUATION OF THE SAFE
WATER INITIATIVE: MARYLAND PROGRAM FOR
DROWNING PREVENTION

Erinn Hurley Monteiro, Master of Public Health, 2010

Thesis directed by: Assistant Professor Kerry M. Green
Department of Behavioral and Community Health

Increasing swimming ability is a key preventive step in decreasing childhood drowning, but it remains unclear what factors influence parents to ensure that their children learn how to swim. The Safe Water Initiative: Maryland community-based program provided a series of free swimming lessons to children who had previously never received formal swimming instruction. Parents/guardians completed surveys on the first and last days of the program, and six weeks after the program ended. Results revealed significant increases in parents' attitudes and beliefs about swimming importance, perceptions of drowning risk, and intentions to enroll children in lessons; both attitudes/beliefs and perceived susceptibility were significant predictors of intentions. Intentions did not significantly predict behavior, as only 14% of participants' children had received additional instruction at second follow-up. This study provides preliminary findings for future research investigating factors influencing childhood swimming instruction and ways to decrease morbidity and mortality due to drowning.

FACTORS INFLUENCING CHILDHOOD SWIMMING INSTRUCTION:
EVALUATION OF THE SAFE WATER INITIATIVE: MARYLAND PROGRAM
FOR DROWNING PREVENTION

by

Erinn Hurley Monteiro

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Advisory Committee:

Assistant Professor Kerry M. Green, Chair
Professor Kenneth H. Beck
Research Associate Professor Carolyn C. Voorhees

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TABLE OF CONTENTS

| | |
|----------------------------------------------------------|----|
| List of Tables | v |
| List of Figures | vi |
| Chapter 1: Introduction | 1 |
| Problem Statement | 1 |
| Research Questions | 2 |
| Definitions of Study Terms | 5 |
| Significance of the Study | 8 |
| Chapter 2: Background | 13 |
| Chapter Summary | 13 |
| Theoretical Model | 13 |
| Literature Review | 15 |
| <i>The Safe Water Initiative: Maryland Program</i> | 27 |
| Chapter 3: Methods | 33 |
| Study Design | 33 |
| Participants | 33 |
| Materials | 34 |
| Procedures | 36 |
| Variables | 42 |
| Analyses | 44 |
| Chapter 4: Results | 47 |
| Participant Characteristics | 47 |
| Scale Development | 53 |
| Findings Regarding Barriers | 54 |
| Findings Regarding Attitudes/Beliefs | 57 |
| Findings Regarding Perceived Susceptibility | 60 |
| Findings Regarding Behavioral Intentions | 63 |
| Findings Regarding Behavior Change | 66 |
| Qualitative Program Feedback | 70 |

| | |
|----------------------------------------------------------------------------|-----|
| Chapter 5: Discussion | 72 |
| Central Findings and Implications | 72 |
| Limitations | 74 |
| Directions for Future Research and Intervention | 76 |
| Conclusions | 80 |
| Appendices | 81 |
| Appendix A: Conceptual Framework | 81 |
| Appendix B: <i>Make a Splash</i> Exit Skills Assessment | 82 |
| Appendix C: SWI:M Program Advertisements and Registration | 83 |
| Appendix D: Parent Water Safety Handout | 89 |
| Appendix E: Program Registration Confirmation E-mail | 90 |
| Appendix F: Study Recruitment E-mails | 91 |
| Appendix G: Study Information Sheet | 92 |
| Appendix H: Pretest (Survey 1) | 94 |
| Appendix I: First Posttest (Survey 2) | 96 |
| Appendix J: Second Posttest (Survey 3) | 97 |
| Appendix K: IRB Approvals | 101 |
| Appendix L: Key Variables, Research Questions, and Analytic Approach | 104 |
| References | 106 |

List of Tables

Table 1: MPH Program Competencies

Table 2: Participant Demographics

Table 3: Ages of Children Participating in SWI:M Program

Table 4: Parent Swimming-Related Information

Table 5: Parent Swimming Ability by Sex, Race, Education, and Income

Table 6: Characteristics of Participants with High Intention Change

List of Figures

Figure 1: *Swimming Importance Attitudes and Beliefs Scale*

Figure 2: *Drowning Susceptibility Scale*

Figure 3: Frequency of Barriers Reported

Chapter 1: Introduction

Problem Statement

In the United States, drowning is a preventable primary cause of unintentional morbidity and mortality in children and adolescents. In 2006, drowning was the second-leading cause of unintentional injury death among children 1-14 years of age (Centers for Disease Control and Prevention [CDC], 2010a). It was also the third- and fourth-leading cause of death overall in children ages 1-4 and 5-9, respectively (CDC, 2010a).

Drowning fatalities in children are more common among males (CDC, 2010b), minority racial groups (CDC, 2010b), and those from low-income households (Ellis & Trent, 1995; Saluja et al., 2006).

Increased swimming ability and water safety skills are considered important drowning prevention methods (American Academy of Pediatrics [AAP], 2000; Brenner et al., 2001; Brenner & AAP, 2003; CDC, 2008; International Life Saving Federation Education Committee, 2007; World Health Organization [WHO], 2010), yet evidence suggests that approximately 65% of children ages 4-11 and 45% of children/adolescents 12-17 cannot swim at all or in deep water (Irwin, Irwin, Ryan, & Drayer, 2009). The research has also identified disproportionate swimming ability among African-American and Hispanic children, and those of low socioeconomic status (Irwin et al., 2009). Combined with the similar drowning fatality rates in the same demographic groups, evidence suggests that minority children of low socioeconomic status should be a primary target for child drowning prevention programs, with a potential solution of offering reduced-cost swimming lessons for those populations (Irwin et al., 2009; USA Swimming Foundation, 2008).

As a result of these recommendations, the USA Swimming Foundation's *Make a Splash* campaign created a network of swimming programs across the country, called "Local Partner Programs," that offer reduced- or no-cost swimming programs and water safety classes for economically disadvantaged children and families. However, while it is hoped that these programs help raise awareness about the importance of learning to swim, there is currently no mechanism to systematically evaluate program effectiveness. Importantly, insight into the factors that influence parents' decisions to enroll their children in swimming lessons is lacking from the existing research.

In summer 2010, a Local Partner Program in the Baltimore area offered the *Safe Water Initiative: Maryland* (SWI:M) program, a series of free swimming lessons for individuals who had never had them before. Since most of the participants were children, the SWI:M program provided a unique research opportunity to learn more about how the parents of those children felt about the importance of learning how to swim, knowledge of water safety issues, and the risk of drowning. The study also allowed us to explore the barriers that prevented these parents from seeking swimming instruction for their children in the past. Finally, we were looking to evaluate whether providing this type of free introductory lesson program is a useful model that may be followed by other Local Partner Programs in addressing drowning prevention within their communities.

Research Questions

The research questions for this study are presented below. For a visual representation of how these research questions were formulated, a conceptual framework is provided (Appendix A). Details on the theoretical basis for this study is provided in Chapter 2, and the analyses of these research questions are described in Chapter 3.

1. Barriers:

- What were the most common barriers that prevented parents from seeking swimming instruction for their children prior to the SWI:M program?
- Are any barriers associated with lower perceived susceptibility of drowning?
- Are any barriers associated with less favorable attitudes and beliefs about swimming importance?
- What demographic characteristics are associated with barriers?

2. Attitudes and Beliefs:

- How did participants' attitudes and beliefs about swimming importance change from pretest to posttest?
- How are parents' attitudes and beliefs about swimming related to their intentions to enroll their children in lessons?
- What demographic characteristics predict more favorable attitudes and beliefs?
- What demographic characteristics are associated with parents whose attitudes and beliefs increased the most from pretest to posttest?

3. Perceived Susceptibility:

- How did parents' perceived susceptibility of drowning change from pretest to posttest?
- How is parents' perceived susceptibility of drowning related to their attitudes and beliefs about swimming importance?
- How is parents' perceived susceptibility about drowning related to their intentions to enroll their children in lessons?

- What demographic characteristics predict higher perceived susceptibility?
- What demographic characteristics are associated with parents whose perceived susceptibility increased the most from pretest to posttest?

4. Behavioral Intentions:

- How did participants' intentions to seek additional swimming instruction for their children change across the three time points (pretest, posttest, second posttest)?
- How do participants' attitudes/beliefs about swimming importance and perceived susceptibility of drowning predict intentions to enroll children in swimming lessons?
- What demographic characteristics predict stronger intentions?
- What demographic characteristics are associated with parents whose intentions increased the most from pretest to posttest?

5. Behavior Change:

- What proportion of participants had *enrolled children in additional lessons* at second posttest?
 - Did intentions to enroll children in lessons as reported at first posttest predict this behavior?
 - Is enrollment in lessons associated with the degree of change in attitudes and beliefs or perceived susceptibility?
 - What demographic characteristics are associated with parents who did enroll their children in lessons?

- What proportion of participants had *changed their supervision practices* at second posttest?
 - Are changed supervision practices associated with the degree of change in attitudes and beliefs or perceived susceptibility?
 - What demographic characteristics are associated with parents who reported changing their supervision practices?

Definitions of Study Terms

To fully inform the reader, key terms are defined below.

- *Attitudes*: The sum of a person's *beliefs* about the consequences of performing a particular behavior, weighted by his/her evaluations of these beliefs (National Cancer Institute, 2005); in this study, parents' evaluation of whether swimming lessons are important as a drowning prevention mechanism.
- *Barrier*: Any perceived belief about the material or psychological cost of taking action (National Cancer Institute, 2005) or actual obstacle imposing a boundary or limit; in this study, any reason that has prevented parents from enrolling their children in swimming lessons prior to the program.
- *Behavioral intention*: A person's perceived likelihood of performing a behavior (National Cancer Institute, 2005); in this study, parents' intention of enrolling their children in swimming lessons.
- *Beliefs*: Degree to which an individual holds a premise about a behavior and the outcomes of that behavior to be true, sum of which shapes a person's *attitudes* (National Cancer Institute, 2005); in this study, parents' beliefs about the

importance of learning how to swim that may shape their attitudes regarding swimming lessons.

- *Cue to action:* Factors that activate readiness to change (National Cancer Institute, 2005); in this study, participating in the free introductory lessons of the SWI:M program may activate a parent's readiness to continue swimming instruction for their child.
- *Drowning:* The process of experiencing respiratory impairment from submersion/immersion in liquid; drowning outcomes are classified as death, morbidity, and no morbidity (van Beeck, Branche, Szpilman, Modell, & Bierens, 2005).
- *Impact evaluation:* Looks at changes in factors (i.e., predisposing, enabling, and reinforcing factors) that influence the likelihood that behavioral and environmental change will occur (Green & Kreuter, 2005). In this study, because we are looking at factors influencing parents' intentions of enrolling children in swimming lessons, it is a form of impact evaluation.
- *Jewish Community Center (JCC) of Greater Baltimore:* Community-based organization that "promotes and strengthens Jewish life and values through communal programs and activities for individuals and families" (JCC, 2010); has facilities in Owings Mills, Maryland and Park Heights (Baltimore city), Maryland.
- *Local Partner Program:* A nationwide network of swimming clubs, YMCA's, recreational departments, school districts, and other organizations participating in the *Make a Splash* campaign that have pledged to donate a percentage of its

swimming lessons at no or low cost to children in need; programs must meet certain requirements to apply (USA Swimming Foundation, 2010b).

- *“Make a Splash” campaign:* The primary programming initiative of the USA Swimming Foundation. Launched in 2007, it is a national child-focused water safety initiative aimed at providing the opportunity for all children to learn to swim, particularly minority and disadvantaged populations who are most at risk of drowning (USA Swimming Foundation, 2010a).
- *Perceived susceptibility:* A person’s beliefs about the chances of some health problem/condition affecting them (National Cancer Institute, 2005); in this study, parents’ perceptions that their child is at risk of drowning if he/she does not know how to swim.
- *Process evaluation:* Gauges the extent to which a program is being carried out according to plan (Green & Kreuter, 2005). In this study, this is the term used to describe the *Make a Splash* evaluation of Local Partner Programs.
- *Program evaluation:* A systematic method for collecting, analyzing, and using information to determine the effectiveness of a program at the process, impact, and/or outcome levels (Green & Kreuter, 2005).
- *Safe Water Initiative: Maryland (SWI:M):* A four-day free swimming lessons program sponsored by the JCC of Greater Baltimore (Owings Mill location) in both May and June 2010 for children and adults who have never taken formal swimming lessons. The program was open to JCC members and non-members. More details on this program are provided in Chapter 2 and Appendix C.

- *Swimming lessons / swimming instruction:* Lessons are conducted on a continuum and can range from water acclimation, to basic water survival skills, to full swimming stroke development. In this study, swimming lessons are defined as formal instruction by a certified Water Safety Instructor on water survival and safety principles that may be effective in self-rescue for drowning prevention.
- *Swimming ability:* Ability is measured on a continuum, but for the purposes of drowning prevention and this study, we define swimming ability as “able to swim for an extended period of time.”
- *USA Swimming:* The national governing body for the sport of swimming in the United States; a 300,000-member service organization that promotes the culture of swimming and serves the sport (USA Swimming, 2010).
- *USA Swimming Foundation:* A non-profit organization that serves as the fundraising arm of USA Swimming with the mission of expanding the sport (USA Swimming Foundation, 2010c).

Significance of the Study

Program/Community Impact

As evaluation is an important component of any program (Green & Kreuter, 2005), this study allowed for a more systematic review of the SWI:M program. This evaluation will be useful for the JCC in determining how to maintain current achievements or make changes as necessary for program improvement and enhancement. Demographic data of study participants will help the program determine whether to make changes to the program’s recruitment and advertising strategies in order to reach more families in need of swimming instruction. This information will also provide an

understanding of the barriers that are most relevant to those who enroll in the program. Additionally, an understanding of parents' intentions and decisions to seek additional swimming instruction after the free week will allow the program to assess whether it is meeting its primary goal of engaging more families in swimming and water safety training. Finally, responses to the open-ended questions on the second posttest will be especially useful in understanding what participants did and did not like about the program, and specific suggestions for improving it in the future.

National Impact

This study has potential to impact other learn-to-swim programs around the country. As a member of the *Make a Splash* Local Partner Program network, the JCC of Greater Baltimore is one of hundreds of organizations in the country offering free- or reduced-cost swimming lesson programs, but according to USA Swimming, it is the only program that had plans in place for conducting an impact evaluation of this nature (B. Kirkner, personal communication, March 26, 2010). Currently, all Local Partner Programs are required to provide *Make a Splash* with quarterly reports on process evaluation outcomes such as the number of children participating/taught, their demographics, and whether they were able to pass a basic safety skills test (USA Swimming Foundation, 2010a). While these are useful statistics in demonstrating the *reach* of the programs, it does not provide information about actual program *impact* – whether families retained the knowledge and skills they obtained and continued their swimming and water safety training after the program ended. According to the program's discussions with USA Swimming, no other Local Partner Programs have conducted program evaluations beyond the process level, particularly related to the

factors influencing parents' intentions to continue swimming/water safety instruction for their children after the program is over (B. Kirkner, personal communication, March 26, 2010). This evaluation will be useful in considering the best use of resources for the *Make a Splash* swimming programs and provide initial evidence about the potential sustainability of such programs. Further, the director of the SWI:M program, Bill Kirkner, serves on the American Red Cross National Advisory Board for Lifeguarding, and indicated that these findings could be critical in developing new national lifeguarding recommendations (personal communication, March 26, 2010).

Research Impact

From a research perspective, the predictive value of the conceptual model developed for this study (discussed in detail in Chapter 2) is tested through our research questions. Hypotheses confirmed or rejected through this study could be further examined to determine whether the model, or components of it, holds up to theory. Further, there is currently a lack of reliable and valid scales measuring constructs specific to the importance of knowing how to swim and drowning risk. The two scales developed for this study (discussed in detail in Chapters 3 and 4) on parents' attitudes/beliefs and perceived susceptibility warrant continued testing and development in order to fill this gap in the current research.

Public Health Impact

At the broadest level, this study is an important step in potentially decreasing preventable morbidity and mortality due to drowning. Ensuring that children learn to swim is widely recommended drowning prevention method (AAP, 2000; Brenner et al., 2001; Brenner & AAP, 2003; CDC, 2008; International Life Saving Federation

Education Committee, 2007; WHO, 2010), but there is a lack of research surrounding the factors that influence a child's likelihood of obtaining swimming lessons. This study will make advances in the limited research in this area by examining the barriers individual factors affecting parents' intentions and decisions to enroll their children in swimming lessons. Understanding how these factors interrelate is an important consideration in recommending swimming lessons as a drowning prevention method.

Program Competencies

As the final culminating activity of the University of Maryland's Master of Public Health program in Community Health Education, the Master's thesis must demonstrate the successful attainment of several program competencies. These competencies include both those which are considered "Public Health Core Competencies," as well as those which are considered to be "Community Health Education Cognate Competencies" (University of Maryland, 2009). The study provided opportunity for the demonstration of several of these competencies, particularly those relating to program evaluation and research methods. Table 1 lists the core and cognate competencies most relevant to the study, and the ways in which they were demonstrated.

Table 1: MPH Program Competencies

| Competency | Description | Method of Demonstration |
|------------------------|------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|
| Core 1.A | Identify social and behavioral causes of morbidity and mortality | Literature review and significance of problem |
| Core 1.B | Explain contributing behaviors and determinants of behaviors (e.g. predisposing, enabling, reinforcing) | Literature review and development of conceptual framework |
| Core 2.C | Recognize how theory can be used to address health problems | Application of Theory of Planned Behavior and Health Belief Model to survey design and program evaluation |
| Core 7 | Describe and apply appropriate descriptive statistical methods for summarizing public health data | Analysis of survey results |
| Core 8 (A-D) | Apply descriptive and inferential statistical methods that are appropriate to the different study designs used in public health research | Analysis of survey results |
| Core 10 (A-C) | Draw appropriate inferences based on statistical analyses used in public health research | Analysis of survey results and discussion of conclusions |
| Core 12.B | Describe risk factors for major public health problems and evidence in support of these factors | Literature review |
| Core 14.A | Identify public health problems from existing information | Literature review and significance of problem |
| Cognate 2.B | Conduct formative research with target audiences, experts, and gatekeepers that informs the intervention process | Background research and discussions with USA Swimming and JCC |
| Cognate 4 (A-C) | Apply evidence-based approaches in the development and evaluation of social and behavioral science interventions | Literature review and development of study instruments |
| Cognate 5.C | Create intervention materials that match the educational needs of various audiences | Development of Water Safety Recommendations sheet for parents |
| Cognate 6 (A, B, C, G) | Conduct evaluation and research related to health education | Implementation of study methods and analysis |
| Cognate 9.A | Advocate for public policy that improves public health | Dissemination of findings with JCC and USA Swimming |

Chapter 2: Background

Chapter Summary

This chapter includes: (1) a description of the theoretical basis for the study, (2) a review of the relevant literature, and (3) a detailed description of the *Safe Water Initiative: Maryland* (SWI:M) program. We first describe how the conceptual model for this study was comprised of specific components of two individual-level theories – the Health Belief Model (Rosenstock, 1974) and the Theory of Reasoned Action (Fishbein & Ajzen, 1975). The literature review provides an overview of the current research on drowning rates and methods of prevention, including the impact of swimming ability and instruction. Finally, the description of the SWI:M program, within the context of the USA Swimming Foundation *Make a Splash* initiative, provides important background information on how the study was carried out.

Theoretical Model

Put simply, the study was based on the assumption that a child who receives swimming lessons does so because his/her parent or guardian enrolled them in those lessons. The research questions this study is attempting to address are related to the *intrapersonal* factors that influence a parent's decision to obtain swimming instruction for their child. As opposed to interpersonal- or community-level theories, intrapersonal-level theories focus mainly on individual factors – those existing or occurring within the individual self or mind, such as knowledge, attitudes, beliefs, motivation, and personality traits (Glanz, Rimer, & Lewis, 2002; National Cancer Institute, 2005). As such, the research questions for this study draw upon two prominent intrapersonal-level health behavior theories: the Theory of Reasoned Action and the Health Belief Model. Multiple

constructs from each theory were combined to produce a unique conceptual model (Appendix A), which guided the research.

The Theory of Reasoned Action (TRA) (Fishbein & Ajzen, 1975) explores the relationship between behavior and beliefs, attitudes, and intentions. The TRA assumes that behavioral intention is the most important determinant of behavior. Further, the theory assumes that behavioral intention is influenced by a person's attitude toward performing the behavior, as well as the subjective norms concerning the behavior in question. In this study, the *behavioral intention* of a parent to enroll their child in swimming lessons is one of the main constructs that we were looking to measure. We also looked at how parents' *attitudes and beliefs* about swimming and water safety issues influenced that intention.

The Health Belief Model (HBM), one of the most widely recognized in the field (Rosenstock, 1974), examines the factors that encourage or discourage people from engaging in certain behaviors. According to the HBM, people are ready to act on a behavior if they: believe they are susceptible to the condition that results from a behavior or lack of behavior (perceived susceptibility); believe the condition has serious consequences (perceived severity); believe taking action would reduce their susceptibility to the condition or its severity (perceived benefits); believe costs of taking action (perceived barriers) are outweighed by the benefits; are exposed to factors that prompt action (cue to action); and are confident in their ability to successfully perform an action (self-efficacy). In this study, we proposed that several of these constructs are related to a parent's intention to seek swimming instruction for their children. Parents will be more likely to enroll their children in swimming lessons if they believe their children are at

higher risk for drowning if they do not know how to swim (*perceived susceptibility*). They also must believe that swimming lessons are important enough to overcome any perceived or actual barriers (*perceived barriers*). We are also looking to determine whether the instruction and education received as part of the SWI:M program serves as a *cue to action* for parents to seek future swimming lessons for their child (i.e., whether there is actual behavior change).

In summary, parents' *behavior* of enrolling their children in swimming lessons is influenced by their *behavioral intention* to do so. Further, this intention can be influenced by several individual-level factors, including:

- 1- The *barriers* (perceived and actual) preventing parents from enrolling their children in lessons (HBM);
- 2- Their *attitudes and beliefs* about the importance of learning to swim and key elements of water safety instruction (TRA);
- 3- Their *perceived susceptibility* of their child drowning if he/she does not know how to swim (HBM); and
- 4- Receiving a *cue to action* in the form of a free swimming program to demonstrate the importance of drowning prevention methods (HBM).

Literature Review

Drowning as a Public Health Problem

Drowning is a leading cause of childhood unintentional injury death and disability in the United States. From 1999-2006, drowning was the second leading cause of unintentional injury death among U.S. children between 1 and 14 years of age (CDC, 2010b). Of all the unintentional drownings in the U.S. during 2006, 30% of the victims

were under the age of 20, and 20% were under the age of 15. Among children and adolescents, there were over 1,000 fatal unintentional drownings that year, averaging three deaths per day (CDC, 2010b).

A drowning can happen in a variety of circumstances and is usually quick and silent. A child will lose consciousness two minutes after submersion, with irreversible brain damage occurring within four to six minutes (Kyriacou, Arcinue, Peek, & Kraus, 1994). Importantly, it is estimated that for every child under age 15 that drowns in the U.S., there are three to five nonfatal submersions that are serious enough to require emergency department care (CDC, 2010b). The consequences of such non-fatal, “near drownings,” can be devastating. Near-drowning can cause brain damage that may result in severe, permanent disabilities including memory problems, learning disabilities, and loss of basic functioning (Kyriacou et al., 1994). Near-drownings also take a tremendous financial toll on affected families and society as a whole. Though there is limited information on near-drowning costs, an analysis of California hospital records from 1991 indicate that the total cost of a single near-drowning that results in brain injury can be more than \$4.5 million (Ellis & Trent, 1995).

Sociodemographic Factors

In addition to age, drowning rates have been shown to vary by gender, race, ethnicity, and income level, as detailed below:

Gender. Statistics show that drowning fatalities occur much more often in boys than in girls (CDC, 2008; Saluja et al., 2006). After one year of age, males are at greater risk than are females, with peaks in both the toddler and adolescent age groups (Brenner, 2003).

Race. Racial disparities in childhood drowning rates are most marked after five years of age. Fatal drowning statistics from 1999-2006 show that the drowning rate of African-American children ages 5-14 is more than three times that of White children in the same age range (CDC, 2010b). Rates are also higher in both American Indian/Alaska Native and Asian children than White children of the same age (CDC, 2010b). One study that examined the site of U.S. drowning deaths by age and race found that, after the age of ten years old, the risk of drowning in a swimming pool was ten times greater among African-American males compared with White males (Brenner, Trumble, Smith, Kessler, & Overpeck, 2001). Another national study that examined U.S. swimming pool drownings from 1995-1998 in residents ages 5-24 found that almost half of the victims were African-American and a third were White (Saluja et al., 2006).

Ethnicity. National statistics do not show elevated drowning rates among the Hispanic population. However, as reported by Brenner and the American Academy of Pediatrics Committee on Injury, Violence, and Poison Prevention (Brenner & AAP, 2003), because most individuals of Hispanic origin are coded as White on their death certificates, drowning fatality statistics may not accurately represent Hispanic ethnicity. In one study, drowning rates among Hispanic males ages 15-24 years were found to be two to five times greater than among White males of comparable age (Brenner & AAP, 2003), suggesting that there may be a possible relationship between ethnicity and drowning, although more research is clearly necessary.

Income. Worldwide, low income has consistently been linked with higher drowning fatality rates (International Life Saving Federation, 2007; WHO, 2010). Even in the United States, evidence indicates that drowning death rates vary inversely with per

capita income (Brenner & AAP, 2003; Brenner et al., 2009; CDC, 2008). In one study, researchers found that among all drownings, almost 50% were classified as low income (Saluja et al., 2006). Few studies have explored whether racial differences are simply a mask for socioeconomic differences, thus the role of socioeconomic status on drowning rates, independent of race, is not well-documented. Saluja et al. (2006) concluded that income is only partially responsible for the discrepancy in drowning rates between Black and White victims; persistence in racial differences after adjusting for income suggests that cultural factors may also be important when examining drowning risks.

Swimming Ability

The inability to swim is commonly accepted as a risk factor for drowning (Brenner et al., 2001; Brenner & AAP, 2003; CDC, 2008; International Life Saving Federation Education Committee, 2007; WHO, 2010). Consequently, it is commonly accepted that swimming instruction, in combination with other prevention strategies, can be viewed as part of a multifaceted approach to drowning prevention (Brenner et al., 2009, WHO, 2010). In general, though, there is a lack of research on swimming ability rates and the connection between swimming instruction and drowning risk.

Regarding overall swimming ability, only three U.S. studies were found in the literature that relied on large enough samples to make population-based estimates; one study was on adults (Gilchrist, Sacks, & Branche, 2000), and the two recent studies commissioned by USA Swimming focused mainly on children (Irwin et al., 2009, USA Swimming Foundation, 2010d).

In 1994, Gilchrist et al. (2000) conducted a random digit-dialed telephone survey of over 5,000 adults. They found that 37% of respondents reported “limited swimming

ability” (defined in that study as being able to swim less than 25 yards, or one pool length). Interestingly, swimming ability differed significantly by race. The inability to swim was high among African-Americans (62%) and Hispanics (44%), particularly compared to Whites (32%).

In 2008, based on the racial inequalities represented in competitive swimmers, USA Swimming commissioned researchers at the University of Memphis to examine the swimming ability of children ages 4-17 ($N = 1,680$) in six U.S. cities. In Phase I of the study (Irwin et al., 2009), children ages 6-16 at YMCA facilities in each city completed written surveys about their swimming ability and barriers to swimming (data from children under age 12 was provided by their parent/guardian). Swimming inability in this study was defined as “unable to swim” or “can swim a little, but not comfortable in deep water.” Results showed that swimming inability by race was highest among African-American (58%) and Hispanic/Latino (56%) children, compared to 31% of Whites (Irwin et al., 2009). Further, low household income and parental educational attainment were strongly associated with lower self-reported swimming ability in this sample, reflecting other findings that significantly link socioeconomic status to youth participation in physical activity (Irwin et al., 2009).

In 2010, Phase II of the USA Swimming-commissioned study (USA Swimming Foundation, 2010d) took a closer look at some of the key variables that had emerged in Phase I related to swimming ability. This phase again consisted of surveys ($N = 1,909$) of children ages 4-17. In this study, swimming inability (defined as either “no skill” or “low skill”) showed similar rates race as in Phase I. African-American (64%) and

Hispanic/Latino (58%) children showed significantly less swimming ability than Whites (41%).

Thus, although data on swimming ability in the U.S. population is scarce, all three of these studies demonstrate similar findings regarding racial and ethnic disparities in swimming ability. Importantly, the common disparities in swimming ability and drowning rates by race, ethnicity, and income provides indirect support for swimming inability as a significant risk factor for drowning.

A true association between swimming inability and increased drowning risk would need to be made retrospectively after a drowning fatality has occurred. Two recent case-control studies have attempted to do this, and both studies revealed that swimming lessons may reduce drowning risk in children in the 1-4 year age group. A study in rural China that examined drowning deaths in children found that victims between the ages of 1-4 ($N = 64$) were significantly less likely to have had swimming lessons (6.8%) than the 128 controls of the same age (12.0%) (Yang, Nong, Li, Feng, & Lo, 2007). In the United States, a recent case-control study conducted by Brenner et al. (2009) is reported as the first study in the country to systematically examine this type of association. In that study, cases ($N = 88$) were children and adolescents that died of unintentional drowning during 2003-2005 in the states of Maryland and North Carolina, and certain counties in Florida, California, Texas, and New York. Interviews of cases' families and 213 matched controls revealed that of the 1-4 year olds who drowned, the drowning victims were significantly less likely (3% vs. 26%) to have participated in formal swimming lessons and were less likely (5% vs. 18%) to have been able to float on their back for 10 seconds. When adjusted for education, race, and risk-taking, formal

swimming lessons remained a significant predictor of drowning risk. In the 5- to 19-year-old group, 27% of cases and 53% of controls had taken swimming lessons, suggesting that although swimming lessons appeared to be protective, the differences between the two groups were not statistically significant. The results of both studies, though conducted with a small sample size, provide preliminary evidence that swimming lessons are likely to offer protection from drowning, particularly at a young age. Currently, information about swimming ability and past participation in formal swimming lessons is not systematically collected as part of the routine investigation of childhood drowning deaths (Brenner et al., 2009). Until such time that there is uniform reporting of this information by all medical examiners and coroners, it will be difficult to collect these types of data on a large enough scale to document a clear association.

Until very recently, there was some ambiguity about the age at which children are ready for and can benefit from swimming lessons. The original recommendations of the American Academy of Pediatrics (AAP, 2000) regarding swimming lessons for children included a claim that children are not developmentally ready for formal swimming lessons until after their fourth birthday. In contrast, recently water-survival skills programs designed for very young children have become increasingly popular and received media attention; some sources have suggested that infants as young as six months of age can learn essential water survival skills such as holding their breath underwater, rolling onto their backs, and floating (Infant Swimming Resource, 2010). It is important to recognize that to date, no scientific study has clearly demonstrated the safety and efficacy of training programs for such young infants.

Still, in light of the recent research described above revealing that swim instruction for young children may decrease drowning (Brenner et al., 2009; Yang et al., 2007), the AAP recently revised its initial recommendations. Its new policy statement adopted in May 2010 acknowledges that the evidence no longer supports an advisory against early aquatic experience and swimming lessons for children of a specific age (AAP, 2010). The AAP still agrees that all children ultimately need to learn to swim, but a parent's decision on whether to start a child in swimming lessons prior to age four should take into consideration a variety of factors and should be "individualized on the basis of the child's frequency of exposure to water, emotional maturity, physical limitations, and health concerns related to swimming pools" (AAP, 2010).

The AAP continues to stress that it is important for parents to recognize that even a child who has had swimming lessons is not "drown-proof," and that swim instructors and programs should stress that message. However, there is strong support that swimming instruction that includes self-rescue and water safety skills can be beneficial and should be encouraged for children at the earliest possible age that is appropriate. Moreover, there is wide agreement that swimming lessons are beneficial in the long run as a drowning prevention method.

Prevention

Primary prevention is imperative to decreasing morbidity and mortality from drowning. Experts agree that swimming skills are just one potential prevention strategy that must be considered in the context of a multifaceted approach that also includes effective physical barriers, appropriate adult supervision, and training in CPR (AAP, 2000, 2010; Cody, Quraishi, Dastur, & Mickalide, 2004; Harborview Injury Prevention

and Research Center, 2007; National Drowning Prevention Alliance, 2009). Knowing how to swim well in a swimming pool does not necessarily make a child safe in natural water environments. Children need to be taught never to swim alone and not to swim without adult supervision (AAP, 2010).

Interventions to prevent drowning often are dependent upon the age of the victim and the circumstances surrounding the event and include environmental, behavioral, and educational approaches. For example, among toddlers, the focus remains mostly on ensuring safe physical water environments (Quan & Cummings, 2003). Such strategies include using appropriate barriers (i.e., fencing, walls, and gates), pool alarms, pool covers, and drain covers (U.S. Consumer Product Safety Commission, 2010). For adolescents and young adults, efforts to decrease risky behavior such as swimming in remote locations or sites that are not designated swim areas, swimming at night, and swimming under the influence of alcohol, may be more beneficial in preventing accidental drowning (Smith & Brenner, 1995).

For all ages, as discussed above, a widely accepted preventive method is increasing swimming ability. However, it is important that youth aquatic programs should include not only physical swimming instruction, but water safety education for both children and their parents (AAP, 2000, 2010). Swimming lessons that conform to American Red Cross standards and are taught by certified Water Safety Instructors typically include essential water safety educational components for both children and parents (American Red Cross, 2010). The education provided as part of swimming instruction should include information on the inherent risks of water, the role of adults in supervising and monitoring the safety of children in and around water, and use of proper

gear (AAP, 2000, 2010; American Red Cross, 2010; Cody et al., 2004; National Drowning Prevention Alliance, 2009).

Adult supervision. As drowning in young children is often associated with a lapse in supervision (WHO, 2010), keeping a close watch on young children and any non-swimmer around any water is an essential preventive strategy (Brenner & AAP, 2003). Whenever infants, toddlers, and any child who cannot swim are in or around water, an adult supervisor with swimming skills should always be within an arm's length, providing "touch supervision" (AAP, 2010; Cody et al., 2004; National Drowning Prevention Alliance, 2009). Children that can swim should still be supervised at all times by a designated adult, using direct visual contact. The attention of the supervising adult should be constantly focused on the child, and the adult should not engage in other distracting activities (e.g., talking on the phone, socializing with other adults, reading, doing chores, eating/drinking) that could potentially compromise the quality of the supervision (National Drowning Prevention Alliance, 2009). Supervision "needs to be close, constant, and capable" (AAP, 2010). In addition, in case of an emergency, the supervising adult should ideally be able to swim, perform a basic rescue, initiate CPR, and call for help (AAP, 2010) and not solely rely in lifeguards to do so.

The National SAFE KIDS Campaign conducted a review of data on childhood drowning occurring in 17 states in the U.S. in 2000 and 2001. As reported by Cody et al. (2004), a key finding was that 88% of children were under some form of supervision when they drowned, including 46% in the care of a parent at the time of the incident. Given these statistics, it is likely that the supervision was not adequate or there was a brief lapse in supervision at the time of the drowning. In addition to the drowning death

reviews, in January 2004 SAFE KIDS conducted an online survey of U.S. parents ($N = 564$) of children 14 years old and younger to learn more about parents' knowledge, attitudes, and behaviors concerning water safety. Regarding supervision, nearly all parents report that they always actively supervise their children while swimming. However, parents also reported engaging in a variety of distracting behaviors while supervising, including talking to others (38%), reading (18%), eating (17%), and talking on the phone (11%) (Cody et al., 2004). Further, 55% of parents believed that there were some circumstances where it is acceptable for a child to swim without adult supervision, such as if the child swims with a buddy (31%), if the child is an excellent swimmer (29%), or if the child has had several years of swimming lessons (23%). Finally, 20% of all parents believed that when lifeguards are present, the lifeguard is the main person responsible for supervising children in the water.

Use of proper gear. While personal flotation devices (PFDs) (i.e., life jackets) are more commonly associated with boating than recreational swimming, they are approved by the U.S. Coast Guard to protect against drowning (Personal Flotation Device Manufacturing Association, 2007). In their review of drowning data, SAFE KIDS found that 97% of children in reviewed cases that drowned in pools or open bodies of water were not wearing a PFD at the time of drowning (Cody et al., 2004). The use of Coast Guard-approved flotation devices is recommended in any situation where a non-swimmer or weak swimmer might accidentally enter the water, such as while boating or playing near the water (AAP, 2010; American Red Cross, 2010). These devices can also provide an extra measure of safety for strong swimmers in open water situations, where the conditions can be much rougher and unpredictable.

It is important not to confuse these approved safety devices with air-filled toys and other swimming aids (e.g., arm bands, inner tubes), which are not approved as safety devices to protect against drowning, and should not be used as such (Brenner & AAP, 2003). Results from the SAFE KIDS survey of parents indicate that many parents mistakenly believe such toys and accessories can protect against drowning (Cody et al., 2004). Of the parents surveyed, nearly 20% believed that air-filled “water wings” can protect children, and nearly 15% believed that air-filled inner tubes can protect children. Beyond safety issues, relying on devices such as water wings as a water acclimation method can potentially delay a child’s ability to learn to swim properly (American Red Cross, 2010; Infant Swimming Resource, 2010). Many swimming programs strongly discourage the use of such devices, as they reinforce a posture in the water that is totally contrary to that needed for swimming: head-up, arms out to the sides with the back arched and the knees bent in a bicycling-style kicking pattern (B-T Aquatics, 2010; Infant Swimming Resource, 2010). Using water wings” in particular can cause children to lose their natural instinct to get back up to the surface of the water on their own, as they have learned from experience to just wait and they will automatically “pop back up” (B. Kirkner, personal communication, March 26, 2010).

With this in mind, it is critical that even “approved” flotation devices are not used as either a replacement for proper adult supervision or not knowing how to swim (National Drowning Prevention Alliance, 2009). Children who cannot swim should not wear flotation devices while playing in the water, and should not be allowed to enter the water unless they are within arms’ reach of a responsible adult who can swim (Cody et al., 2004, National Drowning Prevention Alliance, 2009). In addition to reinforcing bad

posture in the water, flotation devices may promote a false sense of security in the child and parent alike and result in less-vigilant supervision (AAP, 2000, 2010; Brenner & AAP, 2003; Infant Swimming Resource, 2010). Moreover, primary reliance on flotation devices may remove the urgency of the child learning how to swim (B-T Aquatics, 2010; Infant Swimming Resource, 2010); a child who is restricted from entering the water without an adult until they learn how to swim may have more of an incentive to learn to swim on their own.

In considering this information, it is apparent that water safety materials or programs for parents should include education on both the type and quality of supervision they provide to their children when they are swimming as well as the reliance on flotation devices and use of proper gear. The information gleaned from this research was used to develop the water safety handout for parents in this study (Appendix C) as a complement to the free swimming lessons program for their children.

The Safe Water Initiative: Maryland (SWI:M) Program

The summer 2010 SWI:M program at the Jewish Community Center (JCC) of Greater Baltimore was born out of the USA Swimming Foundation's *Make a Splash* campaign. In 2008, the USA Swimming Foundation commissioned a national research study as part of its national *Make a Splash* anti-drowning campaign. The study, which has currently undergone two phases, was conducted by researchers at the University of Memphis, and surveyed children and parents in several U.S. metropolitan areas. The key findings of the first phase of the study, including responses to all survey questions, were presented to USA Swimming (USA Swimming Foundation, 2008) to guide the development of its *Make a Splash* campaign, and the study was published a year later

(Irwin et al., 2009). A key recommendation of this first phase was to create ways to offer free or reduced-cost swimming programs to minority and economically disadvantaged populations – populations who might otherwise not seek out swimming lessons on their own. The second phase of the study, presented to USA Swimming (USA Swimming Foundation, 2010d) but not yet published, focused on analyzing several key variables related to swimming ability that emerged from the first phase. In the second phase, qualitative measures (i.e., focus groups) were added to the quantitative component.

The study's initial findings inspired the development of the *Make a Splash's* Local Partner Program – a nationwide network of community organizations and providers that have joined the USA Swimming Foundation in delivering the *Make a Splash* initiative. The Local Partner Program has grown steadily in the last two years and is ongoing. As an example of the quick growth, as of January 2010 there were 155 Local Partner Programs in 36 states; as of November 2010, there were 225 Local Partner Programs in 42 states. As of January 2010, the JCC of Greater Baltimore was one of 3 such programs in the state of Maryland; in November 2010, there were 9 programs in the state (USA Swimming Foundation, 2010a).

To apply as a Local Partner Program, organizations must meet several requirements, including having specific swimming curriculum standards, qualified instructors, an appropriate instructor to student ratio, and a minimum class number and duration. Organizations must also be willing to incorporate the key feature of *Make a Splash* programming – community service in the form of reduced-cost lessons or water safety educational opportunities. Within their individual communities, Local Partner

Programs provide an opportunity to reach out to children and families most in need of swimming and water safety instruction.

To continue its efforts to ensure that community learn-to-swim programs are available to economically disadvantaged populations, in 2009 the USA Swimming Foundation made grant funding available to its Local Partner Programs. More than 50 programs applied for the financial assistance, and 12 were selected, including the JCC of Greater Baltimore (USA Swimming Foundation, 2009). Each recipient program received up to \$5,000 to help expand their programming for reduced- or no-cost lessons and water safety education in their local communities.

The JCC offered the *Safe Water Initiative: Maryland* (SWI:M) program for the first time in 2009, after being accepted as a *Make a Splash* Local Partner Program. With limited resources the first time around, the grant funds provided an opportunity to enhance and expand upon the program for 2010 and beyond. For 2010, the program expected to use some of the funds to better promote the existing programs. In subsequent years, the program would like to work on developing targeted programs for specific populations, such as high school students and children in inner-city Baltimore (B. Kirkner, personal communication, March 26, 2010).

For the 2010 SWI:M program, the primary eligibility requirement was that the individual had never received previous formal swimming instruction. This pre-requisite was consistent with the program's goal of attracting participants who might normally not seek out swimming lessons. The program was open to children entering first grade and older. The reason for imposing this age requirement is that children that age would have already had socialization experience in a classroom atmosphere, and for only four lessons

of 30 minutes each, the program wants to make the most use of that time (B. Kirkner, personal communication, March 26, 2010). The registration noted that “teens and adults are also welcome” (Appendix C). The same description was provided last year and although the program drew no children above the age of 13, there was fairly high participation among parents who did not know how to swim themselves (B. Kirkner, personal communication, March 26, 2010). Upon receiving registration forms, program staff screened applications to ensure that potential participants met these two criteria.

According to the program director, Bill Kirkner (personal communication, March 26, 2010), the primary intriguing finding from 2009 was that, although JCC scholarships for swimming lessons were promoted, many families who may have qualified for the scholarships ended up purchasing swimming lessons at the JCC after the program was over, and some even bought family memberships to the JCC. According to the director of the program (B. Kirkner, personal communication, March 26, 2010), in 2009 the program received registrations for approximately 80 children and parents; of these, approximately 60 ‘truly participated’ in the lessons (i.e., attended at least 3 of the 4 days). Of the 60, 32 (53%) participated in one or more sets of additional paid swimming lessons at the JCC after the program, with four of those (12.5%) requesting scholarships. The program was hoping that this study during the 2010 program will be able to examine what factors are related to parents’ intentions to sign their children up for additional swimming lessons – and the role that cost plays in this decision.

During the four days of the program, there were three different 30-minute evening time slots in which classes were held. The number of groups being simultaneously run depended on the number of registrants for that session and the number of instructors

available. Consistent with American Red Cross recommendations, the program aimed for an instructor-student ratio of no more than one to six, with a smaller ratio for the younger age groups (i.e., one to four). All classes were taught by certified American Red Cross Water Safety Instructors (WSI) on the staff of the JCC Aquatics Center.

The content of the classes utilized standard American Red Cross WSI curricula that were adapted for a shorter, four-day program. After getting into the water, the first three to five minutes of each class consisted of basic water safety concepts; the remaining portion of the class was focused on teaching specific skills. From an objectives perspective, an “exit skills assessment” (Appendix B) represents the specific skills that participants were expected to have demonstrated/achieved by the end of the week. This checklist is provided by *Make a Splash*. The data on exit assessments from 2009 indicate that the majority of participants were able to perform all criteria by the end of the four days. However, because no data were collected on participants’ skill levels at the beginning of the program, it is difficult to conclude that participants actually obtained new skills during the course of the four-day lessons. The program acknowledges that it is not reasonable to expect that a child will cement development of psychomotor skills in such a short amount of time. Further, even if new skills were developed, they are not enough to demonstrate true swimming ability, which makes the need for continued lessons after the program all the more important (B. Kirkner, personal communication, March 22, 2010). Thus, the program’s primary goals were to generate awareness of the importance of learning how to swim, and engage at-risk swimmers into seeking additional swimming and water safety instruction after the free week of lessons was over.

The research questions for this study were consistent with these overall goals of the program.

This chapter provided important background information for this research: theory, the current literature, and a description of the program. With this understanding in place, the next chapter will focus on the methodology used in carrying out the study.

Chapter 3: Methods

Study Design

The study was a pre-test/post-test single group design with two post-tests (O_1 X O_2 O_3). There were two separate sessions: May 24-27, 2010 and June 14-17, 2010. For each session, the pre-test occurred on the first day of the program and the post-test occurred on the last (fourth) day of the program. The second post-test was administered electronically six weeks after each session ended. There was no control or comparison group.

Participants

Study participants were parents/guardians of youths enrolled in the summer 2010 *Safe Water Initiative: Maryland* (SWI:M) program, run by the Jewish Community Center (JCC) of Greater Baltimore in Owings Mills, Maryland. The participants were not selected for any specific characteristics, as the parents/guardians of all program registrants were invited to participate. However, all participants were required to be at least 18 years of age.

The JCC conducted its own advertising and registration for the SWI:M program through its website and newsletter (Appendix C). Just before the May session began, a local news station featured a story on the program, which helped generate further awareness and registrations for the June session.

Sample Size

Because of the lack of previous research in this area, a goal sample size for this study was not clear, but based on the size of the program in 2009 and the plan for expanded promotion of the program for 2010, it was anticipated that the program would

attract 100-200 individuals for the two sessions. It was hoped that at least 50% of all eligible parents/guardians would participate in the study to obtain an adequate sample size. The final sample size was 86 parents/guardians completing at least one survey (82 individuals completed at least two surveys, and 64 individuals completed all three surveys).

Materials

Instrument Design

Given the lack of existing, validated survey instruments in swimming and drowning prevention research, original survey instruments were developed for the purpose of this study. For our baseline survey, questions related to frequency of swimming, swimming ability, and barriers to obtaining swimming instruction were derived from the report that the researchers at the University of Memphis (Irwin et al., 2009) presented to USA Swimming two years ago. That report (USA Swimming Foundation, 2008), which summarized the key findings of their study, included the responses to each survey question; thus, the survey questions could be deduced.

The central part of our instrumentation, and the source for examining the pre- and post-test relationships between our key variables, was the 21-item scale in Surveys 1 and 2. This scale asked respondents to indicate their level of agreement with a series of statements related to their intentions, attitudes, beliefs, and perceptions regarding swimming instruction and water safety. The formatting of this scale was derived from the 33-item scale used in the Irwin et al. (2009) study, as described in the USA Swimming Foundation (2008) report, which was drawn from physical activity constraint literature as well as input from physical activity/youth swimming experts and USA

Swimming representatives (Irwin et al., 2009). For our study, we used the same format whereby each item was posed as an affirmation statement requiring respondents to provide a response on a 4-level Likert scale (1=Strongly Disagree, 2=Disagree, 3=Agree, 4=Strongly Agree). However, consistent with the primary objectives of our study, the majority of the statements were designed to measure two key variables: attitudes and beliefs about swimming and water safety importance, and perceived susceptibility of drowning. To develop many of these statements, we turned to the results of the National SAFE Kids study (Cody et al., 2004), which examined parents' attitudes and related behaviors about water safety, as related to childhood drowning risk. We contacted the Safe Kids USA office to try to obtain a copy of the survey instrument that was used in their study; however, office staff was unable to locate the instrument (J. Grabowski, personal communication, April 12, 2010). Although the actual instrument was not available, the data on parents' self-reported attitudes and behaviors, as written in the report by Cody et al. (2004), provided sufficient context for developing statements to measure these constructs on our scale.

The timing of the study did not allow for pilot-testing of the survey instruments; however, the instruments' content validity were reviewed by three faculty members at the University of Maryland, one of whom has extensive knowledge and background in swimming, as well as several members of the JCC Aquatics Center and SWI:M program staff. Thus, the study served as a pilot test for these instruments and the specific scales that were created to measure attitudes/beliefs and perceived susceptibility.

Water Safety Handout

An original parent educational handout, titled “Summer Water Safety Recommendations for Parents,” (Appendix D) was developed by the researcher in consultation with the program. The handout utilized the logo for the SWI:M program, making it specially designed for the participants in the program. The recommendations provided on this handout were based upon existing research on drowning statistics and expert recommendations regarding the importance of swimming lessons, supervision, and use of personal flotation devices as a replacement for knowing how to swim. The information on the handout served as both a benefit of participation (as it was provided to participants after completing the first survey) and an additional means of providing education and reinforcing the concepts covered during the four-day program.

Procedures

Study Planning

In an effort to determine the feasibility of the study, a number of discussions were held with the Aquatics Director of the JCC, who also serves as the director of the SWI:M program. We discussed the goals and objectives of the program, including lessons learned from the 2009 program and future directions. We discussed the study methodology, including basic logistics, recruitment and communication with parents, participation incentives, and materials. The program staff reviewed and approved all survey instruments and the educational handout that were developed for the study.

Participant Recruitment

Registration confirmation e-mail. After the application deadline for each session, the SWI:M program sent a registration confirmation e-mail to each accepted program

participant or their parent/guardian (for all children/teens under age 18). In addition to logistical information, the e-mail included basic information about the study, with an invitation and encouragement to participate in the evaluation process to help assess the program's effectiveness and help with future program planning efforts. The e-mail included notification that parents would receive additional information about the evaluation process via e-mail from the researcher directly. Appendix E contains a copy of the registration confirmation e-mail sent by the program.

Recruitment e-mails. After the registration confirmation e-mail was sent, the SWI:M program provided the researcher with the list of e-mail addresses for all registered participants, de-identified. Five days before the first day of each session, the researcher sent a mass e-mail to all registered program participants informing them about the study. A reminder e-mail was sent one to two days before the first day of the program. To protect the identity of all individuals, e-mail addresses were included in the bcc: block, which allowed the recipients of the e-mail to remain anonymous. The e-mail body summarized the purpose of the study and survey procedures, and provided assurance that participation in the research was voluntary and would not impact their child's ability to participate in the SWI:M program. See Appendix F for copies of the recruitment and reminder e-mails sent to registered program participants.

A dedicated e-mail address for this study was created and used by the researcher to send the recruitment and reminder e-mails. The same e-mail address was also used to send out the online survey six weeks after the lessons as the second post-test. This address also served as a way for any participant to contact the researchers at any point with questions regarding the study.

Study information sheet. The study information sheet (Appendix G) was attached to the recruitment e-mail as a Word document. The purpose of the study information sheet was to provide all potential participants with enough information about the study to make an informed decision regarding their participation. The information sheet included a statement that the survey and the research had been reviewed by the University of Maryland Institutional Review Board (IRB). The information sheet covered completion of all three surveys (pre-test, post-test, and the second post-test) and contained all of the elements of a standard consent form, without requiring participants to sign their name. Completion of any one survey did not necessitate participation in all waves. Since no identifiable information was collected on the surveys, we did not collect signed consent forms due to a potential risk of breach of confidentiality, since the consent form would be the only document containing the participant's name. Since participation in the study was voluntary, completion of the surveys implied consent to participate. The study information sheet was also provided to participants at the time they received the first survey. This process ensured that all participants received and had the opportunity to read the document.

Survey Data Collection

The total time investment for each participant was 10-15 minutes for the first survey, 5-10 minutes for the second survey, and 5-10 minutes for the third survey. Copies of the survey instruments (pretest, posttest, second posttest) can be found in Appendices H through J.

Prior to the program, the researcher was provided a list of all registered participants that included their names, ages, contact information, and group/instructor

assignments. The researcher separated the information onto two different sheets so that names and contact information was kept separate from each other to ensure anonymity.

Pretest. On the first day of the program, the researcher was provided with a table near the pool entrance on which to set up the pretest survey, study information sheet, folder for completed surveys, and pens. The researcher was asked to check-in the participants and hand out identification cards provided by the JCC to be used on subsequent days of the program. There were three 30-minute lesson blocks (5:00pm-5:30pm, 5:40pm-6:10pm, and 6:20pm-6:50pm). As each participant arrived for the lesson, they stated their name at the check-in table and were provided with their identification card. The researcher welcomed the participants and explained where to wait for their lesson to start. For all parent/guardians arriving with their children, the researcher first verified the contact telephone number and e-mail address on the registration list, and then provided the parent/guardian with a pretest survey and a study information sheet. The researcher explained that the e-mail address on file would be used to send the third survey six weeks after the program; the telephone number would be used to follow-up with the participant if he/she did not respond to the survey. The researcher reiterated that the surveys were anonymous and asked participants to place their surveys in the folder on the check-in table when they finished them. The researcher also reiterated the importance of writing the 'Participant ID' number at the top of the survey and answered any questions about how to complete it. Parents/guardians who were not participating in the swim lesson themselves completed the survey while their child was taking the lesson. Parents/guardians who were participating in the lesson completed the survey prior to or following the lesson. As participants placed their completed surveys in

the folder, the researcher thanked them and provided them with a copy of the “Summer Water Safety Recommendations for Parents” handout (Appendix D).

First posttest. Procedures for the posttest were almost identical to those for the pretest. On the last day of the program, the posttest survey and related materials were set up on the check-in table. As they arrived for the lesson, the researcher asked parents/guardians of child participants to complete the posttest survey. The researcher asked each child’s parent/guardian if he/she had completed the pretest survey on the first day; if they had not (i.e., it was a different parent/guardian accompanying the child to the lesson), then they were provided with a study information sheet as well. The researcher reminded participants to include their ‘Participant ID’ number on the survey and reiterated the importance of ensuring it was the same number that they provided on the pretest. As participants placed their completed surveys in the folder, the researcher thanked them and reminded them that the second follow-up would arrive via e-mail in approximately six weeks.

Second posttest. Six weeks after each session, the researcher sent a Google Docs survey link to each program participant. The Google Docs forms feature allows responses to be automatically populated into an Excel spreadsheet as soon as the participant submits his/her answers. Since the software does not capture the e-mail addresses of respondents in order to maintain anonymity, we included a space for their e-mail address on the survey so that we could track non-responders. The e-mail addresses were extracted from the spreadsheet and stored separately from the rest of the survey responses; this allowed us to view who had responded without associating their e-mail

addresses with their responses. Thus, one database included tracking information and a separate database contained survey responses; these databases were not merged.

For each session, the survey link was sent three times over a two-week period. For the second and third times, it was only sent to the e-mail addresses that had not responded to the survey at that point. After the two weeks had passed, the researcher contacted non-responders by telephone. Eleven of the 71 responses to the second posttest were completed via telephone.

Incentives. Throughout the four days of the program, participants received USA Swimming-sponsored ‘giveaways’ including swim caps, stickers, tattoos, whistles, and stickers. These incentives were free promotional material for the SWI:M program and had minimal value so as not to be coercive. Since the promotional materials were set up on the check-in table, they also served as a way of drawing attention to the surveys and increasing participation.

Anonymity and confidentiality. In order to maintain anonymity while matching each participant’s pre-test, post-test, and second post-test for data analysis, participants were asked to indicate a unique Participant ID code number on the first page of their surveys. The ID number was defined as the 4-digit year of their birth and the last 4 digits of their phone number. Clear instructions on how to write this ID number, as well as an example, were provided on each survey. Each completed written survey was placed in a secure envelope located at the check-in table. After data had been entered, hard copies of the surveys were placed in a file in a locked cabinet at the University of Maryland.

Prior to any contact with participants, the study protocol and materials were approved by the Institutional Review Board (IRB) of the University of Maryland

(Appendix K). The application was deemed exempt as it involved minimal risk to participants.

Variables

The key variables that were measured in this study are: barriers, attitudes and beliefs, perceived susceptibility, behavioral intentions, and behavior change.

Barriers

Barriers to swimming instruction were assessed at pretest only. Since a requirement of the participants in the SWI:M program was that they had never received formal swimming instruction, a question on the pretest asked, “What are the reasons your child has never received formal swimming lessons?” The eight barriers that were listed were derived from the findings of Irwin et al. (2009). Participants were allowed to check all responses that applied to them.

Attitudes and Beliefs

Attitudes and beliefs about the importance of learning how to swim were assessed at the beginning and end of the program by calculating participants’ mean scores on the *Swimming Importance Attitudes and Beliefs Scale*. This scale was comprised of five items from the 21-item scale on both pretest and posttest (Figure 1). Additional information about scale reliability is presented in Chapter 4.

Perceived Susceptibility

Perceived susceptibility about the drowning risk was assessed at the beginning and end of the program by calculating participants’ mean scores on the *Drowning Susceptibility Scale*. This scale was comprised of 11 items from the 21-item scale on

both pretest and posttest (Figure 2). Additional information about scale reliability is presented in Chapter 4.

Figure 1: *Swimming Importance Attitudes and Beliefs Scale*

Ratings on scale are 1-4 (1-strongly disagree, 4-strongly agree). A high score on this scale represents more favorable attitudes and beliefs about, or a high importance placed on, appropriate swimming and water safety instruction.

The following 5 items assessed at both Survey 1 (pretest) and 2 (posttest) are included in this scale:

- I believe it is important for my child to learn to swim.
- It is important for me as a parent/guardian to know child CPR.
- I would like for my child to take additional swimming lessons.
- I am willing to pay for swimming lessons for my child.
- If I qualified financially, I would be interested in receiving a JCC scholarship for swimming lessons.

Figure 2: *Drowning Susceptibility Scale*

Ratings on scale are 1-4 (1-strongly disagree, 4-strongly agree). A high score on this scale represents high perceived susceptibility of drowning. 'R' means the rating is reverse coded in data entry/analysis.

The following 11 items assessed at both Survey 1 (pretest) and 2 (posttest) are included in this scale:

- When my child is around a pool, I worry about him/her drowning.
- I am afraid of my child drowning or being injured when he/she is in the water.
- When a lifeguard is present, he/she is the main person responsible for supervising swimmers. **(R)**
- I should always supervise my child when he/she is in the water.
- When I supervise my child swimming, I should always be in the water with him/her within arms' reach.
- While I supervise my child swimming, I should not do other things at the same time such as eat, read, talk with other parents, or talk on the phone.
- It is okay for my child to swim without me if he/she is a good swimmer. **(R)**
- It is okay for my child to swim without me if he/she swims with a buddy. **(R)**
- It is okay for my child to swim without me if he/she stays in shallow water. **(R)**
- It is okay for my child to swim without me if he/she uses a life jacket. **(R)**
- It is okay for my child to swim without me if he/she uses an air-filled flotation device such as "water wings" or inner tubes. **(R)**

Behavioral Intentions

Behavioral intentions to enroll children in subsequent swimming instruction following the SWI:M program was assessed at all three time points (pretest, posttest, second posttest) by a single question. On the pretest and posttest, one of the statements on the 4-point Likert scale asked participants to provide their level of agreement with the statement, “I intend to sign up my child for additional swimming lessons this summer.” On the second posttest, participants were asked, “Do you intend to sign up your child for swimming lessons in the future?” (Yes/No/Not Sure).

Behavior Change

Two aspects of behavior were assessed, both at the second posttest. The main behavior that we were interested in was whether participants had enrolled their children in swimming lessons since the SWI:M program had ended six weeks earlier. As illustrated by our theoretical basis and conceptual framework, intentions to enroll children in lessons would predict that behavior. We were also interested in seeing whether parents had made any changes to their supervision practices since the SWI:M program had ended. Both behaviors were followed up with open-ended “Why or why not?” in order to obtain additional information about the behavior change (or not change).

Analyses

Data Entry

All categorical data were coded numerically for data entry and analysis. Missing data were coded as “99.” Using Participant ID codes to match the first and second surveys, data were manually entered into Microsoft Excel. Data from the third survey was automatically inputted into a Google Documents spreadsheet as each participant

completed the survey. The final Google Documents spreadsheet was then outputted to Microsoft Excel. After matching all three survey data by Participant ID codes, the final Excel spreadsheet was transferred into PASW SPSS version 18.

Data Analysis Procedures

The first stage of the data analysis was to run basic descriptive statistics for all variables. For continuous variables, we examined means, medians, and standard deviations. For categorical variables, we looked at proportions within each category. The frequency analyses allowed us to determine whether any variables needed to be regrouped and recoded (e.g., grouping all non-Black/African-Americans categories into one since they comprised only 20% of the sample, grouping the two highest income brackets together, etc.). Several variables on the scales needed to be reverse-coded prior to any analyses on those items. We ran reliability analyses on both scales until we had determined the most appropriate composition for each that would be used in analysis.

After calculating mean scores on the two scales, we looked at change in our key variables across different time points through the use of paired t-tests. We then examined bivariate associations between variables using a variety of analytic techniques. For example, to examine associations between demographic characteristics, Pearson's chi-square analyses were used. We also utilized ANOVAs to determine, for example, if the mean scores on attitudes and beliefs at baseline varied by the race of the participant.

By examining bivariate associations, graphically and through these statistical tests, and having examined the distribution of variables, we were then prepared to test multivariate associations. To answer our specific research questions, we primarily relied upon linear and logistic regression analyses. This enabled us to evaluate the relationships

between behavior change, intentions, attitudes/beliefs, perceived susceptibility, barriers, and demographic characteristics. With all analyses, we ensured that we did not violate any of the assumptions of the particular statistical test.

Appendix L summarizes the analysis techniques performed for each key variable and related research questions. The next chapter will discuss the results of these analyses, as well as findings related to participant characteristics and the scales used in the study.

Chapter 4: Results

Participant Characteristics

A total of 86 individuals completed the first ($N = 81$), second ($N = 79$), and/or third ($N = 71$) surveys. Table 2 illustrates the demographics of the sample. Participants were predominantly female (86%), Black/African-American (81%), non-Hispanic/Latino (96%), mothers (80%) who were not members of the JCC (93%). The mean and median age was in the 36-40 year-old bracket. The sample was well-educated, with 73% having a college degree or higher, compared to the Maryland state average of 31.4% (United States Census Bureau, 2010). The mean and median household income was in the \$50,000-\$74,999 bracket, well above the qualifying income for a free (<\$28,665) or reduced (\$28,666-\$40,793) school lunch program for a family of four (United States Department of Agriculture, 2009). Additionally, Table 3 illustrates the ages of the participants' children participating in the SWI:M program. Thirty-seven percent had two or more children participating in the program. The mean child age was 9.32 years old (range: 5-17), and the majority (69%) of participants' children enrolled in the program were age 10 or younger (median = 9).

Table 2: Participant Demographics

| | | Number | Percent* |
|---------------------------------------------|---------------------------------|-------------------------|-----------------|
| Session | Session 1 (May 24-28) | 23 | 27% |
| | Session 2 (June 14-17) | 63 | 73% |
| | Total | 86 | |
| JCC Membership Status | Member | 6 | 7% |
| | Non-Member | 75 | 93% |
| | Total | 81 (<i>Missing=5</i>) | |
| Sex | Male | 12 | 14% |
| | Female | 72 | 86% |
| | Total | 84 (<i>Missing=2</i>) | |
| # of children participating in SWI:M | One | 51 | 63% |
| | Two or more | 30 | 37% |
| | Total | 81 (<i>Missing=5</i>) | |
| Relationship to child(ren) | Mother | 69 | 80% |
| | Father | 11 | 13% |
| | Other guardian | 6 | 7% |
| | Total | 86 | |
| Age | 30 and under | 14 | 17% |
| | 31-40 | 35 | 43% |
| | 41-50 | 33 | 40% |
| | Total | 82 (<i>Missing=4</i>) | |
| Race | Black/African-American | 66 | 81% |
| | Not Black/African-American | 16 | 19% |
| | Total | 82 (<i>Missing=4</i>) | |
| Ethnicity | Hispanic/Latino | 3 | 4% |
| | Not Hispanic/Latino | 74 | 96% |
| | Total | 77 (<i>Missing=9</i>) | |
| Education Level | High school diploma/GED or less | 22 | 27% |
| | College/technical school degree | 42 | 52% |
| | Graduate degree | 17 | 21% |
| | Total | 81 (<i>Missing=5</i>) | |
| Household Income | Less than \$25,000 | 9 | 11% |
| | \$25,000-\$49,999 | 31 | 38% |
| | \$50,000-\$74,999 | 24 | 30% |
| | \$75,000 or greater | 17 | 21% |
| | Total | 81 (<i>Missing=5</i>) | |

*Valid percentage of total after accounting for missing data through list wise deletion

Table 3: Ages of Children Participating in SWI:M Program*

| Age | Number | Percent** |
|-------|--------|-----------|
| 5 | 8 | 7% |
| 6 | 14 | 12% |
| 7 | 17 | 14% |
| 8 | 14 | 12% |
| 9 | 17 | 14% |
| 10 | 12 | 10% |
| 11 | 12 | 10% |
| 12 | 3 | 2% |
| 13 | 9 | 7% |
| 14 | 5 | 4% |
| 15 | 3 | 2% |
| 16 | 4 | 3% |
| 17 | 1 | <1% |
| Total | 119 | 100% |

* Includes children of study participants (parents/guardians) only

** Ages of children were missing for 5 study participants

Pearson's chi-square tests were primarily conducted to test the relationships between demographic variables since they were categorical in nature. Where cell sizes were not adequate to conduct Pearson's chi-square tests for two-by-two comparisons, Fisher's exact tests are reported. The ethnicity variable was not included as there were not enough non-Hispanic/Latino individuals ($N = 3$) to conduct the analyses without violating the assumptions. The five variables that were examined were parent age category, sex, race, education level, and household income level. No relationships were significant at the alpha .05 level. A marginally significant relationship was found between education level and income ($\chi^2 = 4.99$, $df = 2$, $p = .082$), indicating that participants whose highest level of education is a high school diploma (or less) tended to have a lower household income (under \$50,000).

Table 4 illustrates the swimming-related information of the participants. Nearly a quarter (24%) of the parents/guardians surveyed also participated in the SWI:M program, indicating that at least this proportion of parents/guardians had never taken swimming lessons before. In fact, the self-reported swimming ability of participants indicated that 70% were low-skilled (i.e., at-risk) swimmers themselves, defined as either “unable to swim” (37%) or “can swim a little, but not comfortable in deep water” (33%).

Further analysis revealed that 80% of the low-skilled swimmers frequented the pool with their family at least one time per month per month during the summer, with 61% of them frequenting the pool at least 3 times per month. Consequently, a Pearson’s chi-square analysis revealed a significant relationship between parent swimming ability and summer family pool frequency ($\chi^2 = 11.26$, $df = 3$, $p = .01$) with low-skilled swimmers frequenting swimming pools with their families more often than moderate/advanced-skilled swimmers.

Table 4: Participant Swimming-Related Information

| | | Number (N) | Percent (%)* |
|-------------------------------------------------|--------------------------------------|------------------------------------------------------|-------------------------|
| Participated in SWI:M program with child | Yes | 20 | 24% |
| | No | 62 | 76% |
| Parent/Guardian Swimming Ability | Low-skilled | Unable to swim | 30 37% |
| | | Can swim a little, but uncomfortable in deep water | 27 33% |
| | Moderately-skilled | Comfortable in deep water, but cannot swim very long | 19 23% |
| | Skilled | Able to swim for an extended period of time | 6 7% |
| Family Swimming Frequency (Summer) | Never/very rarely | | 11 14% |
| | Rarely (1-2 times/month) | | 17 21% |
| | Sometimes (3-4 times/month) | | 25 31% |
| | Frequently (more than 4 times/month) | | 28 34% |
| Family Swimming Frequency (Non-Summer) | Never/very rarely | | 58 72% |
| | Rarely (1-2 times/month) | | 17 21% |
| | Sometimes (3-4 times/month) | | 4 5% |
| | Frequently (more than 4 times/month) | | 2 2% |

**Valid percentage of total after accounting for missing data through list wise deletion.*

Additional Pearson's chi-square analyses and Fisher's exact tests were performed to assess the relationship between parent swimming ability and demographic variables (Table 5). Swimming ability was regrouped to combine moderate and advanced swimming ability to ensure a sufficient *N* for analysis.

Table 5: Parent Swimming Ability by Sex, Race, Education, and Income

| | | Parent Swimming Ability | | Total |
|------------------------------|----------------------------|-------------------------|---------------------------------|-------|
| | | Low-skilled | Moderately and advanced-skilled | |
| Sex⁺ | Female | 51 (73%) | 19 (27%) | 70 |
| | Male | 4 (40%) | 6 (60%) | 10 |
| | | | | 80 |
| Race[*] | Black/African-American | 50 (76%) | 16 (24%) | 66 |
| | Not Black/African-American | 7 (44%) | 9 (56%) | 16 |
| | | | | 82 |
| Education[*] | HS diploma or less | 20 (91%) | 2 (9%) | 22 |
| | College degree or higher | 37 (63%) | 22 (37%) | 59 |
| | | | | 81 |
| Income⁺ | <\$50,000 | 31 (78%) | 9 (22%) | 40 |
| | \$50,000-\$74,999 | 18 (75%) | 6 (25%) | 24 |
| | \$75,000 and up | 8 (47%) | 9 (53%) | 17 |
| | | | | 81 |

* $p < .05$, ⁺ $p < .10$

A significant relationship was found with race ($p = .018$, Fisher's exact test); Black/African-American individuals tended to have lower swimming ability than non-Black/African-Americans. A significant relationship was also found with education level ($p = .014$, Fisher's exact test); an education level of high school diploma or lower was associated with lower swimming ability. A marginally significant relationship was found with sex ($p = .063$, Fisher's exact test); females were more likely to have lower swimming ability than males, although the total number of male participants was very low. A marginally significant relationship was also found with income level ($\chi^2 = 5.65$, $df = 2$, $p = .059$) where participants in lower income brackets were of lower swimming

ability. No significant relationships were found between swimming ability and age, or swimming ability and non-summer pool frequency.

Power analysis

Once we had obtained the final sample size, we conducted post-hoc power analyses. Using G*Power 3.1.2 (Faul, Erdfelder, Bucner, & Lang, 2009), we selected two sample analyses to identify how well-powered the study was. First, we examined the power for the paired t-test assessing change in attitudes/beliefs and determined our power was 0.98, demonstrating significant power for paired t-test analyses. Second, we calculated power for the logistic regression analysis of behavioral intentions predicting lesson enrollment and found power to be 0.84, again suggesting adequate power.

Scale Development

To measure the key constructs of attitudes/beliefs and perceived susceptibility, two separate scales were developed from questions on the 21-item scale that was administered at both pretest and posttest.

Swimming Importance Attitudes and Beliefs Scale

The original proposed scale included eight items measuring aspects of parents' attitudes regarding the importance of swimming lessons and beliefs regarding key elements of water safety. After conducting an initial reliability analysis on the scale with both the pre-test and post-test data (Cronbach's alpha = 0.560 and 0.553), three items were removed in order to increase reliability: "I know child CPR and could perform it in an emergency if needed," "Using flotation devices are a good way to teach my child to swim," and "When a lifeguard is present, he/she is the main person responsible for

supervising swimmers.” The final scale consisted of five items and had a Cronbach’s alpha of 0.695 for the pretest items and 0.573 for the posttest items.

Drowning Susceptibility Scale

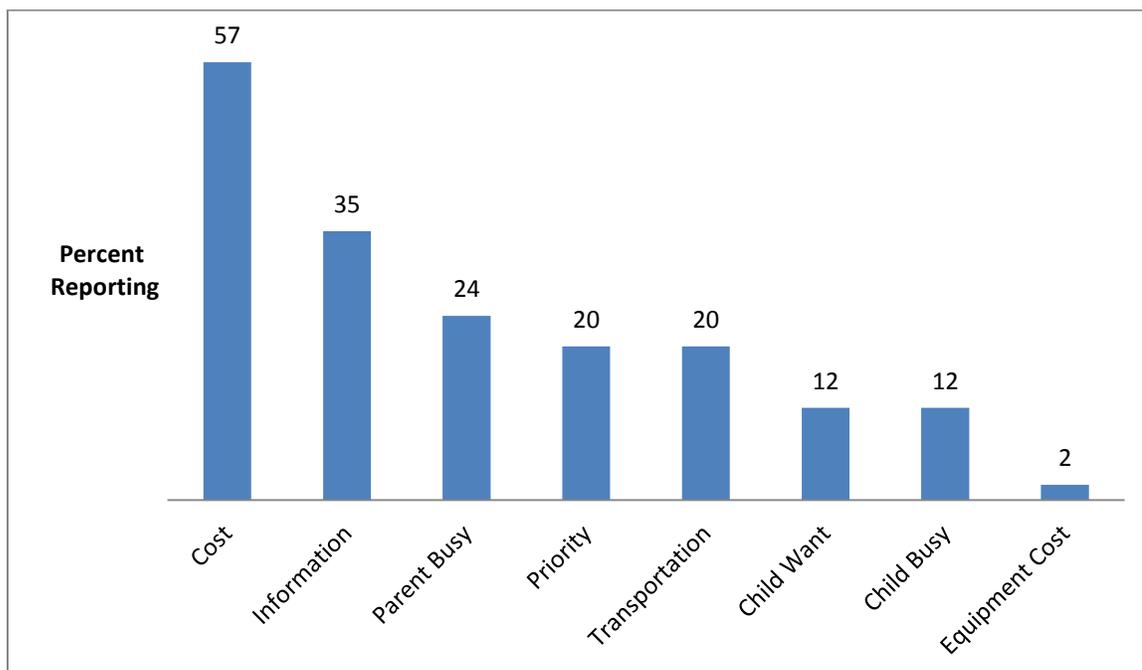
The original proposed scale included eleven items measuring aspects of parents’ perceptions regarding overall risk or susceptibility to drowning. After conducting an initial reliability analysis on the scale with both the pre-test and post-test data (Cronbach’s alpha = 0.656 and 0.852), one item was removed (“I feel comfortable being around a pool with my child”) and one of the discarded items from the *Swimming Importance Attitudes and Beliefs Scale* was added (“When a lifeguard is present, he/she is the main person responsible for supervising swimmers”). The final scale that was used in analyses consisted of eleven items and had a Cronbach’s alpha of 0.711 for the pretest items and 0.869 for the posttest items.

Findings Regarding Barriers

Four research questions addressed barriers to swimming instruction. First we identified the prevalence of different types of barriers:

RQ #1: What were the most common barriers that prevented parents from seeking swimming instruction for their children prior to the SWI:M program?

The frequencies of each barrier reported are illustrated in Figure 3. Of note is that since each participant was able to select all barriers that applied to him/her, responses are not mutually exclusive. The five most common barriers reported were the cost of lessons (57%), not knowing how to find information about lessons (35%), the parent/guardian being too busy (24%), swimming lessons not being a high priority (20%), and transportation issues to lessons (20%).

Figure 3: Frequency of Barriers Reported

Next we examined associations between barriers and our key constructs of perceived susceptibility and attitudes/beliefs:

RQ #2: Are any barriers associated with lower perceived susceptibility of drowning?

An independent samples t-test assessed whether individuals reporting a particular barrier had significantly different mean scores on the *Drowning Susceptibility Scale* at baseline than those not reporting that barrier. The only marginally significant barrier was a lack of information ($t(78) = 2.28, p = .097$); participants indicating the information barrier ($M = 2.60, SD = .46, N = 29$) had lower perceived susceptibility of drowning than those who did not report this barrier ($M = 2.77, SD = .38, N = 51$). All other barriers were not statistically significant (p 's > .10).

RQ #3: Are any barriers associated with less favorable attitudes and beliefs about swimming importance?

An independent samples t-test assessed whether individuals reporting a particular barrier had significantly different mean scores on the *Swimming Importance Attitudes and Beliefs Scale* at baseline than those not reporting that barrier. No barriers were statistically significant (p 's > .10).

Finally, we looked at relationships between barriers and the participants' demographic characteristics:

RQ #4: What demographic characteristics are associated with the most common barriers?

Pearson's chi-square tests and Fisher's exact tests were conducted to test the relationships between each barrier and the demographic variables (parent age, sex, race, education level, household income, parent swimming ability). Again, the ethnicity variable was not included as there were not enough non-Hispanic/Latino individuals ($N = 3$) to conduct the analyses without violating the assumptions.

For the cost barrier ("Lessons cost too much money"), significant associations were found with sex ($p = .018$, Fisher's exact test) and income ($p < .001$). Females and participants with lower incomes were more likely to report the cost barrier.

For the information barrier ("You did not know how to find information on lessons"), significant associations were found with race ($p = .042$, Fisher's exact test) and education level ($p < .001$, Fisher's exact test). Black/African-American individuals and those with a high school diploma or less were more likely to report the information barrier.

For the transportation barrier ("Finding transportation to swimming lessons can be a problem), a significant association was found with education ($p = .009$, Fisher's exact

test); individuals with a high school diploma or less were more likely to report the transportation barrier.

For the child busy barrier (“Your child is too busy”), a significant association was found with race ($p = .009$, Fisher’s exact test); non-Black/African-American individuals were more likely to report that their children were too busy for swimming lessons.

Finally, for the priority barrier (“You did not consider swimming lessons to be a high priority”), a significant association was found with education ($p = .030$, Fisher’s exact test); individuals with a high school diploma or less were more likely to report the priority barrier. Three barriers (parent too busy, child did not want to take lessons, equipment is expensive) had no significant associations with demographic variables (p ’s $>.10$).

Findings Regarding Attitudes and Beliefs

Four research questions on attitudes and beliefs were examined. This construct was measured by mean scores on the *Swimming Importance Attitudes and Beliefs Scale*, consisting of 5 scale items, at both pretest and posttest. The scale is measured on a 4-point Likert scale where higher scores represent more favorable attitudes and beliefs about swimming importance.

First, we looked at how scores changed from pretest to posttest:

RQ #5: How did parents’ attitudes and beliefs about swimming importance change from pretest to posttest?

Paired t-tests were used to examine the change in attitudes and beliefs between pretest and posttest. There was a significant increase in mean attitudes and belief scores from

pretest ($M = 3.51$, $SD = 0.39$, $N = 81$) to posttest ($M = 3.71$, $SD = 0.29$, $N = 79$), $t(74) = -4.35$, $p < .001$.

Next, we looked at the relationship between attitudes/beliefs and the key construct of behavioral intentions:

RQ #6: How are parents' attitudes and beliefs about swimming related to their intentions to enroll their children in lessons?

Consistent with our conceptual framework, we hypothesized that higher (i.e., more favorable) scores on the *Swimming Importance Attitudes and Beliefs Scale* would predict stronger intentions to enroll the child(ren) in subsequent swimming instruction. An unadjusted linear regression analysis was used to test whether scores on the *Swimming Importance Attitudes and Beliefs Scale* predicted higher intention scores at both pretest and posttest. Results indicated that favorable attitudes and beliefs significantly predicted stronger intentions at both pretest ($\beta = 1.19$ (95% CI = .85-1.53), $p < .001$) and posttest ($\beta = .85$ (95% CI = .49-1.22), $p < .001$). After determining significant demographic variables (as part of the next research question), the linear regression was adjusted for education; results were still significant at the alpha .001 level for both pretest and posttest.

Next, we looked at whether any demographic variables might predict baseline scores on the *Swimming Importance Attitudes and Beliefs Scale*:

RQ #7: What demographic characteristics predict more favorable attitudes and beliefs?

Bivariate linear regression analyses were used to test whether scores on the *Swimming Importance Attitudes and Beliefs Scale* at pretest could be predicted by any demographic

variables (age, sex, race, ethnicity, education, income, swimming ability). Each demographic variable was run separately against the mean scores. The only variable that was significant at the alpha .05 level was education; the rest were not statistically significant (p 's > .10). Education (3 levels) was a significant predictor ($\beta = .14$, 95% CI = .01-.26, $p = .039$) of attitudes and beliefs, where mean scores were lower ($M = 3.34$, $SD = .42$) for participants with a high school diploma or less than for those with a college degree ($M = 3.57$, $SD = .39$) or graduate degree ($M = 3.58$, $SD = .36$). However, after controlling for income, it was no longer significant ($\beta = .13$, 95% CI = 0-.27, $p = .057$). Regrouping education into 2 levels (high school diploma or less, college degree or higher) elicited significant predictions even after controlling for income ($\beta = .24$, 95% CI = .04-.44, $p = .021$), with those with higher education levels having more favorable attitudes and beliefs even with income taken into account.

Next, we looked at the change in mean scores on the *Swimming Importance Attitudes and Beliefs Scale* from pretest to posttest. The change in scores was calculated by subtracting each individual's pretest score from their posttest scores. Since scores were based on a 4-point Likert scale, the possible range of change was -3 to +3. We were interested in testing whether any demographic variables were associated with the degree of change:

RQ #8: What demographic characteristics are associated with parents whose attitudes and beliefs increased the most from pretest to posttest?

The mean change in scores on the *Swimming Importance Attitudes and Beliefs Scale* from pretest to posttest was .19 ($SD = .36$, range = -.40-1.60). One-way ANOVAs calculated whether the mean change in scores were associated with any demographic variables. The

only marginally significant variable was ethnicity ($F(1, 68) = 3.05, p = .086$); participants who were not Hispanic/Latino were more likely to have higher increases in attitudes and beliefs ($M = .20, SD = .39, N = 3$) than those who were Hispanic/Latino ($M = -.20, SD = .20, N = 67$); however, this result should be interpreted with caution as the total number of non-Hispanic/Latino individuals was so low. All other variables were not statistically significant (p 's $> .10$).

Findings Regarding Perceived Susceptibility

Five research questions on perceived susceptibility were examined. This construct was measured by mean scores on the *Drowning Susceptibility Scale*, consisting of 11 scale items, at both pretest and posttest. The scale is measured on a 4-point Likert scale where higher scores represent higher perceived susceptibility about drowning risk.

First, we looked at how scores changed from pretest to posttest:

RQ #9: How did parents' perceived susceptibility of drowning change from pretest to posttest?

Paired t-tests were used to examine the change in perceived susceptibility, as measured by mean scores on the *Drowning Susceptibility Scale*, between pretest and posttest.

Measured on the 4-point Likert scale, there was a significant increase in mean perceived susceptibility scores from pretest ($M = 2.70, SD = 0.42, N = 81$) to posttest ($M = 3.15, SD = 0.49, N = 79$), $t(73) = -6.70, p < .001$.

Next, we looked at how participants' scores on this scale compared to their scores on the *Swimming Importance Attitudes and Beliefs Scale*:

RQ#10: How is parents' perceived susceptibility of drowning related to their attitudes and beliefs about swimming importance?

Pearson's correlations were conducted to examine the degree to which individuals' scores on the *Drowning Susceptibility Scale* were related to their scores on the *Swimming Importance Attitudes and Beliefs Scale*. Results revealed significant correlations for scores at both pre-test ($r(77) = .296, p = .008$) and post-test ($r(77) = .502, p < .001$), indicating that participants with more favorable attitudes and beliefs about the importance of learning to swim were more likely to have higher perceived susceptibility of drowning.

Next, we looked at whether higher perceived susceptibility scores predicted stronger intentions to enroll children in subsequent swimming instruction, consistent with our conceptual model:

RQ #11: How is parents' perceived susceptibility about drowning related to their intentions to enroll their children in lessons?

An unadjusted linear regression analysis was used to test whether scores on the *Drowning Susceptibility Scale* predicted higher intention scores at both pretest and posttest. Results indicated that higher perceived susceptibility marginally predicted stronger intentions at pretest ($\beta = .35$ (95% CI = $-.06-.76$), $p = .094$), and significantly predicted stronger intentions at posttest ($\beta = .38$ (95% CI = $.15-.61$), $p = .001$). After determining significant demographic variables (as part of the next research question), the linear regression was adjusted for education. Results were not statistically significant at pretest ($p > .10$), but were still significant at posttest ($\beta = .38$ (95% CI = $.14-.63$), $p = .003$).

Next, we looked at whether any demographic variables might predict baseline scores on the *Drowning Susceptibility Scale*:

RQ #12: What demographic characteristics predict higher perceived susceptibility?

Bivariate linear regression analyses were used to test whether scores on the *Drowning Susceptibility Scale* at pretest could be predicted by any demographic variables (age, sex, race, ethnicity, education, income, swimming ability). Each demographic variable was run separately against the mean scores. The only variable that was significant at the alpha .05 level was education; the rest were not statistically significant (p 's > .10). Education (3 levels) was a significant predictor ($\beta = .18$ (95% CI = .04-.32), $p = .015$), even when controlling for income in that perceived susceptibility was lower ($M = 2.49$, $SD = .44$) for participants with a high school diploma or less than for those with a college degree ($M = 2.81$, $SD = .39$) or graduate degree ($M = 2.75$, $SD = .39$).

Next, we looked at the change in mean scores on the *Drowning Susceptibility Scale* from pretest to posttest. The change in scores was calculated by subtracting each individual's pretest score from their posttest scores. Since scores were based on a 4-point Likert scale, the possible range of change was -3 to +3. We were interested in seeing whether any demographic variables were associated with the degree of change:

RQ #13: What demographic characteristics are associated with parents whose perceived susceptibility increased the most from pretest to posttest?

The mean increase in perceived susceptibility scores from pretest to posttest was .43 ($SD = .55$, range = -.55-1.73). One-way ANOVAs calculated whether the degree of change in perceived susceptibility scores was associated with any demographic variables.

Education was statistically significant ($F(1, 70) = 3.31$, $p = .042$); participants whose highest level of education was a high school diploma or less or were more likely to have higher increases in perceived susceptibility ($M = .68$, $SD = .68$, $N = 20$) than those who

had a college degree ($M = .31$, $SD = .49$, $N = 39$) or graduate degree ($M = .35$, $SD = .35$, $N = 14$). All other variables were not statistically significant (p 's $> .10$).

Findings Regarding Behavioral Intentions

Four research questions about behavioral intentions were examined. This construct was assessed by responses to a single question asked on all three surveys. On the pretest and posttest, this question was included on the 4-point Likert scale (“I intend to sign up my child for additional swimming lessons this summer”); on the second posttest, this question had a Yes/No/Not sure option (“Do you intend to enroll your child(ren) in additional swimming lessons.

First, we looked at change in participants’ intentions across the three surveys:

RQ #14: How did participants’ intentions to seek additional swimming

instruction for their children change across the three time points?

Paired t-tests were used to examine the change in mean intention ratings between pretest and first posttest, between first posttest and second posttest, and between pretest and second posttest. Measured on the 4-point Likert scale, there was a significant increase in mean intention ratings from pretest ($M = 3.17$, $SD = 0.77$, $N = 81$) to first posttest ($M = 3.62$, $SD = 0.54$, $N = 79$), $t(74) = -4.41$, $p < .001$. Intention ratings on the second posttest were assessed by a Yes (93%)/No (3%)/Not Sure (4%) response. In order to compare the second and third time points, the second posttest ratings were recoded to match the measurement scale of the first posttest as follows: Yes = Strongly Agree (4), No = Strongly Disagree (1), Not Sure = between Disagree and Agree (2.5). Using this recoding strategy, the paired t-test revealed a significant increase in intentions from first posttest to second posttest ($M = 3.84$, $SD = 0.60$, $N = 66$), $t(65) = -2.33$, $p = .023$. As to

be expected, with significant increases from pretest to first posttest and again from first posttest to second posttest, a paired t-test of the pretest and second posttest showed a significant increase in intentions, $t(67) = -5.77, p < .001$.

Next, we looked at the degree to which attitudes/beliefs and perceived susceptibility predicted intentions within a single model:

RQ # 15: How do attitudes/beliefs about swimming importance and perceived susceptibility of drowning predict intentions to enroll children in swimming lessons?

The degree to which participants' scores on the *Swimming Importance Attitudes and Beliefs Scale* and the *Drowning Susceptibility Scale* predicted intentions to enroll children in lessons at both pretest and posttest were first examined in unadjusted regression analyses (reported in research questions #6 and #11). When examined separately, both scales were found to be statistically significant predictors of intentions at posttest ($p \leq .001$). However, a multiple linear regression of both scales at posttest revealed that while attitudes and beliefs were still significant when adjusting for perceived susceptibility ($\beta = .71, 95\% \text{ CI} = .28-.1.13, p = .001$), perceived susceptibility was no longer significant in this adjusted model ($\beta = .17, 95\% \text{ CI} = -.08-.42, p = .169$).

Next, we looked at whether any demographic variables might predict baseline intentions:

RQ #16: What demographic characteristics predict stronger intentions?

Bivariate linear regression analyses were used to test whether intentions at pretest could be predicted by any demographic variables (age, sex, race, ethnicity, education, income, swimming ability). Each demographic variable was run separately against the pretest

ratings. No variables were significant at the alpha .05 level. The only variable that was significant at the alpha .10 level was swimming ability. Swimming ability was a marginally significant predictor ($\beta = .329$ (95% CI = -.04-.69), $p = .076$) in that intentions were lower ($M = 3.07$) for low-skilled swimmers than for moderate/advanced skilled swimmers ($M = 3.40$). All other variables were not statistically significant (p 's > .10).

Next, we looked at the change in intention ratings from pretest to posttest. The change in ratings was calculated by subtracting each individual's pretest rating from their posttest rating. Since scores were based on a 4-point Likert scale, the possible range of change was -3 to +3. We were interested in seeing whether any demographic variables were associated with the degree of change:

RQ #17: What demographic characteristics are associated with parents whose intentions increased the most from pretest to posttest?

The mean increase in intention scores from pretest to posttest was 0.44 ($SD = .86$, range = -1.0-3.0, $N = 74$). One-way ANOVAs were calculated to assess whether the degree of change in intention scores was associated with any demographic variables; none were statistically significant (p 's > .10). We took a closer look at the individuals whose intentions changed the most to see if there were any notable characteristics. The majority of participants' intentions remained the same or increased by 1 level, but there were 9 participants who increased by 2 levels and 1 participant who increased by 3 levels. In looking more closely at these 10 individuals compared to the overall participant characteristics as reported in Table 2, a few characteristics do stand out. In general, these individuals were younger, had lower education levels, and lower income levels than the overall sample. These comparisons are summarized in Table 6.

Table 6: Characteristics of Participants with High Intention Change

| | Participants With Highest Intention Score Increases (<i>N</i> = 10) | Overall Sample (<i>N</i> = 86) |
|----------------------------------------|-------------------------------------------------------------------------|------------------------------------|
| Sex: Female | 100% | 86% |
| Race: African-American | 100% | 81% |
| Age: Under 30 | 40% | 17% |
| Education Level: HS Diploma or less | 70% | 27% |
| Income Level: Less than \$49,999 | 90% | 49% |

Findings Regarding Behavior Change

Seven research questions examined two aspects of behavior: enrollment in additional swimming lessons, and changes in parents' supervision of their children when swimming. Both behaviors were assessed at the second posttest, six weeks after program completion.

Lesson enrollment was assessed by participants' yes/no responses to the question ("Since the SWI:M program ended, has your child had any swimming lessons?"). Four research questions were associated with this variable. We first examined the frequency of additional participation in swimming instruction following the conclusion of the free program:

RQ #18: What proportion of participants had enrolled children in additional lessons at second posttest?

Fourteen percent (*N* = 10) of the 71 participants responding reported that their child had received additional swimming instruction since the program ended. Of those, 3 (30%)

had enrolled their children in group (full-price) swimming lessons, 1 (10%) had enrolled their child in private (full-price) swimming lessons, 4 (40%) had enrolled their children in reduced-cost or free swimming lessons, and 2 (20%) indicated that their children had spent instructional time in the water with an adult, but not in a formal lesson format. Qualitative analysis of a follow-up “Why or why not?” question indicated that the majority of participants responding “No” to enrolling children in lessons cited cost as the primary limitation, and time/schedules as the secondary limitation.

Next, we looked at whether enrollment in lessons was predicted by participants’ intentions to do so:

RQ 19: Did intentions to enroll children in lessons as reported at first posttest predict this behavior?

Consistent with our conceptual framework, we hypothesized that parents with higher intentions at posttest would be more likely to pursue swimming instruction than parents with lower intentions. A logistic regression analysis was conducted. While parents with higher intentions at post-test were 2.4 times more likely to enroll their child/children in additional swimming instruction, this association was not a statistically significant (OR=2.40 (95% CI = 0.49-11.89), $p = .283$).

We also examined whether the degree of change in attitudes/beliefs and perceived susceptibility were strong predictors of pursuing additional swimming instruction:

RQ #20: Is enrollment in lessons associated with the degree of change in attitudes and beliefs or perceived susceptibility?

Logistic regression analysis indicated that the degree of change on the *Swimming Importance Attitudes and Beliefs Scale* from pretest to posttest was not a good predictor

of lesson enrollment (OR=1.01 (95% CI = 0.15-6.76), $p = .995$), nor was the degree of change on the *Drowning Susceptibility Scale* (OR=0.45 (95% CI = 0.10-2.00), $p = .293$).

Finally, we examined whether enrollment in additional swimming instruction was associated with any demographic variables:

RQ #21: What demographic characteristics are associated with parents who did enroll their children in lessons?

Pearson's chi-square tests and Fisher's exact tests were conducted to test the relationships between lesson enrollment and each demographic variable. Again, the ethnicity variable was not included as there were not enough non-Hispanic/Latino individuals ($N = 3$) to conduct the analyses without violating the test's assumptions. No statistically significant relationships were found with age category, sex, race, ethnicity, education, or income level (p 's $> .10$). A significant relationship was found with swimming ability ($p = .006$, Fisher's exact test) where parents/guardians that had a moderate/advanced degree of swimming ability were more likely to have sought additional swimming instruction for their children after the program (43% of all moderately/advanced- skilled) compared to those who had little to no swimming ability (4% of all low-skilled).

Supervision change was assessed by participants' yes/no responses to the question ("Have you changed the way you provide supervision to your child(ren) in the water as a result of the SWI:M program?"). Three research questions were associated with this variable. We first examined the frequency of those parents reporting changing their supervision practices following the conclusion of the free program:

RQ #22: What proportion of participants had changed their supervision practices at second posttest?

Sixty-six percent ($N = 47$) of the 71 participants responding reported that they had changed the way they provide supervision to their children in the water as a result of the SWI:M program. Qualitative analysis of a follow-up “Why or why not?” question indicated that the majority of participants responding “Yes” to changing their supervision practices indicated that the program raised their awareness of the importance of being a vigilant supervisor and/or how easy it is for a child to drown. The majority of respondents who indicated “No” to changing their supervision practices indicated that they were already supervising properly prior to the program and/or had not learned anything new.

RQ #23: Are changed supervision practices associated with the degree of change in attitudes and beliefs or perceived susceptibility?

Logistic regression analysis indicated that the degree of change on the *Swimming Importance Attitudes and Beliefs Scale* from pretest to posttest was not a statistically significant predictor of supervision change ($OR=0.927$ (95% CI = 0.25-3.47), $p = .910$), nor was the degree of change on the *Drowning Susceptibility Scale* ($OR=1.78$ (95% CI = 0.67-4.72), $p = .248$).

RQ #24: What demographic characteristics are associated with parents who reported changing their supervision practices?

Pearson’s chi-square tests and Fisher’s exact tests were conducted to test the relationships between supervision change and the demographic variables (except ethnicity). No significant relationships were found with any of the demographic variables (age, sex, race, ethnicity, education, income, parent swimming ability) (p ’s > .10).

Qualitative Program Feedback

The second posttest included a qualitative component of three open-ended questions asking for feedback on the program. In response to “What did you like most about the program?” the majority of participants noted the fact that the program was free and that instructors and staff were nice, knowledgeable, encouraging, and well-liked by the children. Other positive feedback was that children learned valuable skills; that the lessons were offered every day; the facility was nice and close to home; and that lessons were catered to all ages.

In response to “What did you like least about the program?” and “What would you change about the program?” the most common response was that participants wished the lessons were longer and that the program was expanded beyond four days so that kids could truly learn new skills. Some participants noted that although the lessons were scheduled to run for 30 minutes, they were usually shorter than that after accounting for time spent organizing the groups and getting everyone in the water. Another common response was that class size should be smaller if possible, particularly since children were all unfamiliar with the water and with swimming lessons. Several participants suggested that parents watching the lessons should be told not to interfere with the lessons or try to talk with their children since it disrupts the class. A few participants noted some administrative disorganization in terms of knowing where exactly the lessons would be held (i.e., indoor or outdoor pools) and class assignments. Several noted that the travel time/distance to lessons was too long, especially considering the time of day the lessons were offered and rush hour traffic; some participants asked that the program be made available at other locations. A few participants noted that the water temperature in the

outdoor pools was too cold and that the program should be conducted in the indoor pool each day. Finally, a few participants suggested that everyone in the program should be offered a discounted fee for additional lessons at the JCC, or allowed to do the program next summer.

Chapter 5: Discussion

Central Findings and Implications

Participants were predominantly African-American mothers, who were generally well-educated and of moderate income level. The majority of participants were at-risk swimmers, defined as having little to no swimming ability, yet alarmingly those same individuals reported frequenting swimming pools with their families in the summer significantly more often than those with higher swimming ability. This finding underlies the importance of swimming instruction programs as a method of drowning prevention. In this study, parent swimming inability was significantly related to being African-American, female, and of lower education and income levels. These results parallel recommendations by Irwin et al. (2009) and the USA Swimming Foundation (2008) that minority children of low socioeconomic status should be a primary target for drowning prevention programs and low-cost swimming lessons. Interestingly, participants in this study with lower education levels were significantly more likely to have less favorable attitudes and beliefs about swimming importance as well as lower perceived susceptibility of drowning. This evidence suggests that education level may be another important factor in considering populations to target for intervention.

The analyses were used to answer 22 research questions for five key variables: barriers, attitudes and beliefs, perceived susceptibility, behavioral intentions, and behavior change. Attitudes/beliefs and perceived susceptibility were each assessed through original scales developed for this study, both of which were found to have good internal consistency and face validity and represent an opportunity for further research in

order to create a standardized instrument that could be used more widely in the field of drowning prevention.

Regarding barriers, cost was reported as the most significant factor precluding swimming instruction prior to the SWI:M program, as well as the primary reason cited for not enrolling children in lessons after the program ended. Many parents also reported not knowing how to find or where to look for information on swimming lessons; those parents also had significantly lower perceived susceptibility of drowning than those not reporting that barrier. These findings underscore the need for community swimming programs to explore ways to increase accessibility to their programs. Programs should consider alternative ways to recruit and retain populations at high risk for drowning in terms of both awareness and affordability.

Participants' attitudes and beliefs about swimming importance, perceived susceptibility of drowning, and behavioral intentions to enroll children in lessons all increased from the beginning to the end of the SWI:M program, suggesting that a program such as this could potentially impact these important intrapersonal-level factors. Further, increased attitudes/beliefs and perceived susceptibility were both found to be significant predictors of intentions, consistent with our conceptual model and theory (Appendix A). Program evaluations with more rigorous designs are the next step to testing the interrelationships among these factors and predictive value of the model, as well as the degree to which change in any of these factors sustains over a longer period of time.

Contrary to our theory, strong intentions did not significantly predict enrollment in subsequent swimming instruction, as only 14% of participants had enrolled their

children in swimming lessons six weeks after the program ended. It is, however, important to remember that a 14% enrollment rate is still an increase over the zero instruction rates that participants' children had upon entering the program. Existing barriers, particularly cost, were reported as a significant reason why parents had not enrolled their children in swimming lessons. Again, these findings emphasize that free or reduced-cost, accessible swimming lesson programs may be a key intervention strategy for child drowning prevention, although additional research on methods to reduce barriers is certainly warranted.

An encouraging finding in terms of the educational benefits of the program was that the majority of participants (66%) reported changing their supervision practices of their children swimming since the program had ended. Thus, while this finding should be confirmed with a more rigorous study design, there is preliminary evidence that this type of free introductory swimming program for children and families of low swimming ability can positively impact parents' perspectives on the importance of vigilant supervision, which has been found to be a key drowning prevention strategy (AAP, 2010; Brenner & AAP, 2003; Cody et al., 2004, National Drowning Prevention Alliance, 2009).

Limitations

In interpreting the findings, there are several limitations to consider regarding the study's methodology. First, it is important to recognize that the participants in this study represent a very narrow segment of the general population, both in size and scope. Although power analyses revealed an adequate sample size for the statistical tests that were run, reliability would be increased with a larger sample, and ideally, across multiple sites. It is also important to recognize that random sampling was not used; the

participants self-selected for the program. Participants had to have a certain level of resources – including transportation to the facility, proper equipment (bathing suit, towel) needed to swim, computer/Internet access, and e-mail use – in order to hear about the program, register, and participate in the lessons. Since advertising for the program did not extend far geographically, participants likely lived relatively close to the JCC, a suburban area. Therefore, the generalizability of the study is limited.

In terms of materials, the survey instruments and scales require continued development and testing. Original scales were developed to assess attitudes/beliefs about swimming importance and perceived susceptibility of drowning at both the beginning and end of the program. Due to limited resources for this study (i.e., time, funding), there was not adequate opportunity to pilot-test the instruments prior to use. Further testing is necessary to establish the internal validity of each scale – whether they actually represent good measures of swimming importance attitudes/beliefs and perceived susceptibility of drowning. In addition, the reliability of the instruments warrants additional testing. Although the items on each scale showed adequate-to-very good internal consistency upon final analysis, given the considerations in the size and scope of the study sample it would be beneficial to conduct reliability analyses after administering the scales to a larger and more diverse population.

In terms of determining the actual effect of the program, there are two additional important limitations to consider. The lack of a control group makes it difficult to determine whether the changes seen (i.e., increases in attitudes/beliefs, perceived susceptibility, intentions) can be attributed to the SWI:M program or if other external factors were involved, so causal inferences should not be drawn at this time. Related,

within the program itself, it is unclear what component of the program might be responsible for such change – the free swimming lessons, the educational materials, or both. This may be an important consideration for the program in determining how to implement the program in the future.

Directions for Future Research and Intervention

Scale Development

As discussed above, an area for future research is the continued development of both the *Swimming Importance Attitudes and Beliefs Scale* and the *Drowning Susceptibility Scale*. Both scales behaved according to theory and our conceptual model (Appendix A) in that high scores on each predicted stronger intentions. In terms of reliability, the latter scale (N of items = 11) shows particular early promise with a Cronbach's alpha of .711 using the participants' pretest responses and .869 using their posttest responses. This means that the items on the scale in this population were very good in terms of being internally consistent with one another, or measuring things the same way. However, it would be worthwhile to continue to test the reliability and validity of the scale. The scale could be tested using a large sample, and could undergo further review to determine if any items should be reworded for clarity, added, or deleted. The scale, if it continues to show good reliability and validity, has the potential to contribute to the current field of child drowning prevention as a standardized instrument that may be used.

Program Level

The results of this study will be shared with both the SWI:M program and with USA Swimming. At the program level, it is expected that the JCC will use the findings

to better inform their planning and implementation of the program for next year and the future. First, the JCC will likely be interested in learning the demographic profile of the study's participants to help understand the types of families they are (and are not) attracting to the program. This information can be used in recruitment next year, as well as for comparison in case the program meets its goal of offering SWI:M at other JCC locations in the area.

In terms of outcomes, the program will be interested in learning about the proportion of families that enrolled their children in swimming lessons after the program ended. The program may initially compare these data to their reported findings from 2009, in which 32 of the 60 participants (53%) participated in one or more sets of additional paid swimming lessons at the JCC at some point after the program ended (B. Kirkner, personal communication, March 26, 2010). In comparing those data to our much lower numbers (10 participants, 14%) reporting having enrolled in additional lessons, it is important to remember that not all SWI:M program participants were captured in this research study (e.g., adult participants), so it is possible that more program participants did enroll in additional lessons than we have reported here. It is also possible that participants had participants enrolled in lessons after the six-week posttest. Still, the program may wish to use this information to reflect upon any differences in the implementation of the program in 2009 compared to 2010, such as how information and materials about available lessons and scholarships were promoted and made available to SWI:M participants.

In addition to its own assessment of how SWI:M worked in 2009 and 2010, the program can also use some of the qualitative feedback from participants to make

improvements and changes to the program for 2011 and beyond. Participants' feedback about class size could be addressed by reducing the instructor-to-child ratio by having more instructors on hand or limiting enrollment based on the number of instructors available. Feedback about parents creating distractions for children could be handled by clearly instructing all parents not to talk to their children while in the lesson, and/or having seminars/activities for parents on water safety issues while their children are in their lessons.

Perhaps most importantly, although participants were clearly grateful for the free program, the comments suggest that many parents may have been operating under the false expectation that their child would truly learn how to swim after completing this program. Several comments expressed disappointment that their child did not learn many new swimming skills, that the session was only for one week, or that the lessons were not always as long as they expected. Since the program's primary goal was to engage families in seeking additional instruction after the program was over, and so few participants had done so by the six-week mark (including non-formal lessons), the program may want to look at ways to address this expectation and promote the need to continue swim instruction after SWI:M is over. For instance, although the JCC does offer scholarships (half-price) for lessons, this opportunity was not well-advertised during the SWI:M program and requires meeting strict income guidelines. Alternatively, or in addition, the program might consider offering reduced-price lessons at the JCC for any past SWI:M participant, without specific income restrictions. Another option may be to alter the resources available for the SWI:M program in order to make reduced-cost

swimming lessons available on a more frequent basis, instead of just one or two weeks in the summer.

Consideration of the data collected and feedback received from participants will allow the JCC to consider the barriers to behavior change in moving forward with its plans for 2011 and beyond. It would be interesting to see how the original theory and conceptual framework, in terms of intentions predicting behavior, hold true when such barriers are addressed.

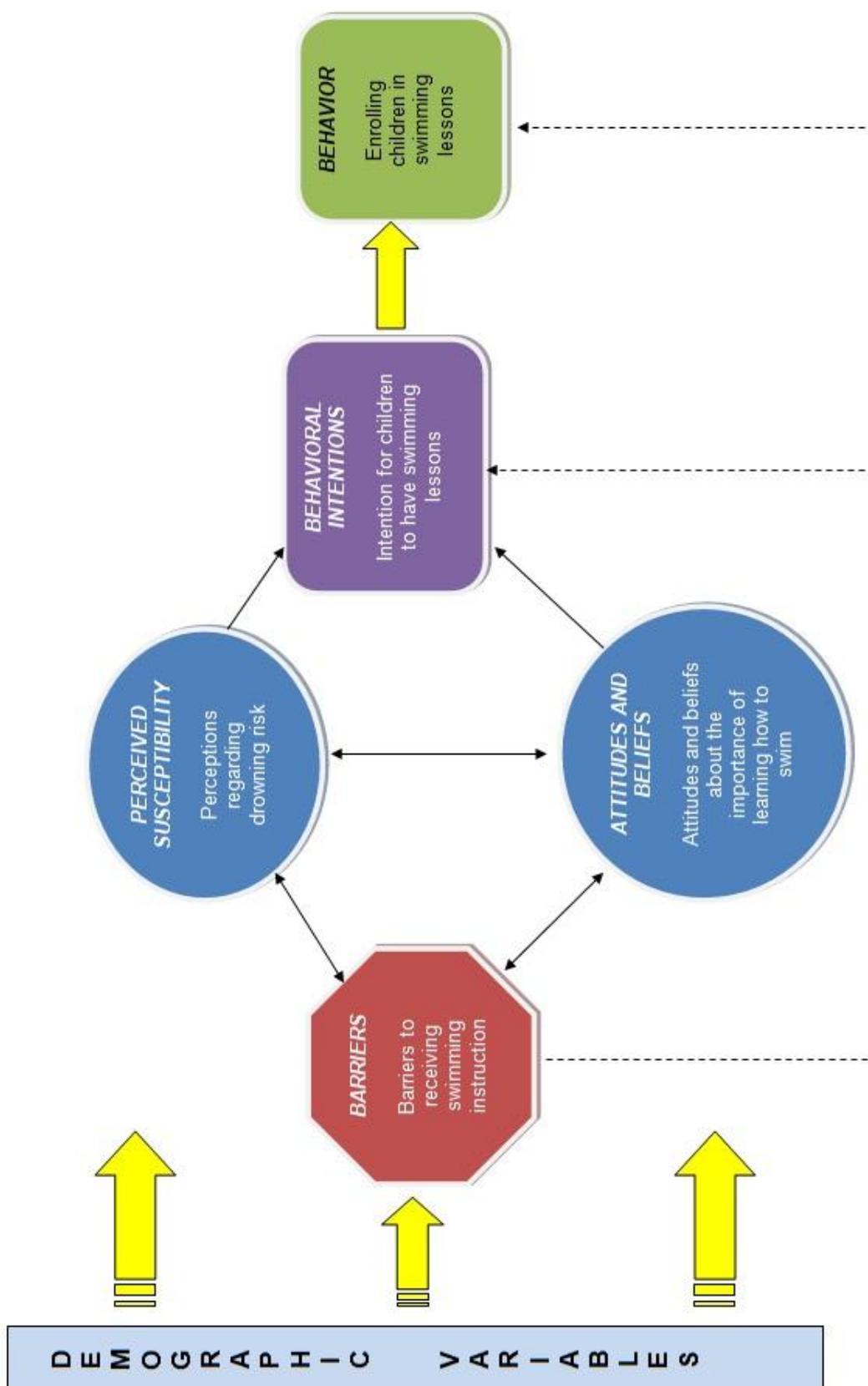
Larger Scale

This study is innovative in that it is the first documented impact evaluation of any of the 225 *Make a Splash* Local Partner Programs aimed at teaching children how to swim and reduce drownings. The USA Swimming Foundation may be interested in exploring whether any part of this study's methodology or survey instrumentation could be replicated with other Local Partner Programs to try to create a more systematic way of evaluating community learn-to-swim programs beyond simple process outcomes. For instance, if the *Drowning Susceptibility Scale* undergoes additional development and is proved to be reliable and valid, it could be provided as a standardized instrument to parents of children enrolled in *Make a Splash*-sponsored swimming programs to see if perceptions of drowning risk do increase from the beginning to the end of such programs. With adequate resources to carry out the research, USA Swimming may be able to initiate further analysis of the other key variables assessed in this study – barriers, attitudes/beliefs, and behavioral intentions. The leadership of USA Swimming and a national-level effort would be useful in evaluating the impact of *Make a Splash*-sponsored learn-to-swim programs as part of their overall anti-drowning campaign.

Conclusions

The findings from this study provide a greater baseline of data for future research investigating factors related to childhood swimming instruction and ultimately preventing drownings. Reduced- or no-cost lessons may be a key drowning prevention method, but additional research is warranted with other community swimming programs to find ways to address prevailing barriers. Evaluating the effectiveness of this and other programs is an important step in potentially decreasing morbidity and mortality due to drowning.

Appendix A: Conceptual Framework



Appendix B: *Make a Splash* Exit Skills Assessment

| Instructor: | Time: | | | Section: | | |
|-------------------------------------------------------------------------------------|-------|--|--|----------|--|--|
|  | | | | | | |
| a. Hold breath for 7-10 seconds | | | | | | |
| b. Tread water with vertical kicking and arm movements for balance and body support | | | | | | |
| c. Float on back and kick for 7 feet | | | | | | |
| d. Float prone and kick for 7 feet | | | | | | |
| e. Jump from the side of the pool with the ability to return to the wall unassisted | | | | | | |

Appendix C: SWI:M Program Advertisements and Registration

[Home](#) > [Aquatics](#) > Safe Water Initiative: Maryland (FREE SWIM LESSONS)



Get in the SWI:M!

(Safe Water Initiative: Maryland)

FREE SWIM LESSONS for Members and Non-members with no prior swim lesson experience

SECOND SESSION ADDED! Monday, June 14 - Thursday, June 17
 Shapiro Recreation Park @ The Rosenbloom Owings Mills JCC
 3506 Gwynnbrook Avenue, Owings Mills, MD 21117
 Class sessions: 5:00 - 5:30pm; 5:40 - 6:10pm; 6:20 - 6:50pm
 Ages: Rising first graders-Adult

[Download an application](#)

Please return applications to:

SWI:M Program
 JCC of Greater Baltimore
 3506 Gwynnbrook Avenue
 Owings Mills, MD 21117

Applications must be returned by June 4, 2010

DID YOU SEE US ON TV?

Bill Kirkner, our JCC Aquatics Director, was featured on WBALTV with Sandra Shaw during the morning of May 24, 2010. He spoke about the importance of knowing how to swim and that the JCC is offering free swim lessons to non-swimmers. Check out the short video by clicking on the video below:



Did you know that drowning is the number one cause of death by accidental injury for children ages 1-4? For people under age 24 drowning is the third most common cause of accidental death. You've got to learn how to swim, especially if you plan to spend time at the beach or the pool!

We take these statistics very seriously. That's why we are joining forces with the [USA Swimming Foundation's Make a Splash™](#) program to make swimming lessons more accessible to the community. The [Make a Splash™](#) program provides scholarships and grants to pay for swimming lessons based on demonstrated financial need.

Summer 2010 will be the second year that the JCC of Greater Baltimore Aquatics staff will be offering FREE introductory swim lessons. **Due to the response to our pre-Memorial day lessons, we have added a second set of free lessons, during the evenings of June 14 - 17, 2010.** These lessons are taught by our certified [American Red Cross Water Safety Instructors](#) and are available to any individual **who has completed kindergarten and has never taken formal swimming lessons.** (Teens and adults are also welcome! We will have separate classes for older students. Parents who are non-swimmers are encouraged to sign up with their children so you can learn how to keep them safe in the water this summer!)

The program will be lots of fun! So start your summer right. By the time the week is over, we hope to have at least 100 new safe swimmers!

Space is limited; [submitting an application](#) or expressing interest in participating does not guarantee acceptance into the program.

To apply for the SWI:M Free Lesson program, please [download and submit an application](#). Applications should be returned **by JUNE 4, 2010**

to:

SWI:M Program
JCC of Greater Baltimore
3506 Gwynnbrook Avenue
Owings Mills, MD 21117

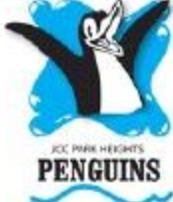
Caregivers for applicants with known medical, physical, emotional or learning limitations should submit a completed [Questionnaire for People with Disabilities or Other Medical Conditions](#) so we can determine whether we can successfully serve the needs of the applicant.

For more information, contact Sue Szembroth: 410.356.5200, x304 or swimlessons@icc.org to get an application.

Grant Funding for this Program provided by:

| | | |
|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|  |  |  |
| <p>The USA Swimming Foundation</p> | <p>Enterprise Vehicle Rentals and the Enterprise Holdings Foundation</p> | <p>American Pool Enterprises</p> |

Program Support for SWI:M provided by:

| | | |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
|  |  |  |
|  |  |  |



SAFE WATER INITIATIVE: MARYLAND (Application)

June 14 - 17, 2010, Classes: 5 - 5:30pm, 5:40 - 6:10pm; 6:20 - 7:00pm

Shapiro Recreation Park @ The Rosenbloom Owings Mills JCC

3506 Gwynnbrook Avenue, Owings Mills, MD 21117

- There is NO CHARGE for lessons offered through the SWI:M program
- Participation in the SWI:M program is limited to people who are at least "school age" (entering first grade; teens and adults are also welcome) and who have no prior formal swim lesson experience
- JCC Membership is **not required** to participate in this program
- Available spaces are limited; submitting an application or expressing interest in participating does not guarantee acceptance into the program.
- Please provide an email address to ensure timely notification regarding the status of your application.
- For more information, please call 410.356.5200, x304, or email swimlessons@jcc.org

Name: _____ Age _____ Date of Birth _____

JCC Member: Yes No Membership Number: _____

If the application is accepted, the student will be assigned to a class that will meet at one of the following times. Please indicate your preference of class time (1= First Choice, 2= second choice, etc.; N/A= Not available):

_____ 5:00 - 5:30pm _____ 5:40 - 6:10pm _____ 6:20 - 7:00pm

Prior swimming instruction/training: _____

What does the applicant hope to gain from this course? _____

Address _____

City _____ State _____ Zip _____

Email Address _____

Home Phone _____ Work Phone _____ Cell Phone _____

If the applicant is under 18 years of age, please provide the following information for at least one parent:

Emergency Information:

Parent/Guardian Name: _____ Date of Birth _____

Phone: _____ Mobile: _____ Relationship: _____

Parent/Guardian/ Secondary Emergency Contact:

Name: _____ If parent, Date of Birth _____

Phone: _____ Mobile: _____ Relationship: _____

Medical Information: Does the participant have any medical condition of which the instructor should be aware? (For example: asthma, bee sting allergies, cardio/pulmonary disorders, diabetes, or suffers from seizures.) Yes No

If yes, please explain: _____

Caregivers for applicants with known medical, physical, emotional or learning limitations should submit a completed **Questionnaire for People with Disabilities or Other Medical Conditions** so we can determine whether we can successfully serve the needs of the applicant.

Waiver: My signature below releases the Jewish Community Center, The Associated Jewish Community Federation of Baltimore, and all of its agencies from any legal, financial or other responsibilities in the event of any injury to my child, myself, or my relation while participating in the Safe Water Initiative Maryland program either on or off the JCC or Associated property. This participant's picture may be used for JCC publicity purposes.

Signature _____ Date _____

Please return this application by June 4, 2010 to: SWI:M Program, 3506 Gwynnbrook Ave, Owings Mills, MD 21117

Many thanks to our sponsors:



ENTERPRISE HOLDINGS.



American Red Cross
Central Maryland Chapter



Aquatics

Go Barracudas!

Congratulations to the following Barracuda swim team members on end-of-season Team Awards!

Spirit Award (Male), *Justin Burnette*

Spirit Award (Female), *Katherine Warfield*

Rookie of the Year (Male), *Asher Baraban*

Rookie of the Year (Female), *Molly Schneider*

Rookie of the Year (Female), *Amy Wasserman*

Team Momentum (contribution to team points)

(Male), *William Zvagelsky*

(Female), *Chana Frand*

Outstanding Junior Barracuda (Male), *Daniel Wise*

Outstanding Junior Barracuda (Female), *Felecia Zvagelsky*

Most Valuable Swimmer (Male), *Vicente Garcia*

Most Valuable Swimmer (Female), *Carrie Ramirez*

Swimmer of the Year (Male), *Daniel Barakh*

Swimmer of the Year (Female), *Jensen Friedman*



Summer Barracudas Registration

Rosenbloom OM JCC

Get ready for a new swim team season! We are now accepting registration for the Summer Swim Team. This year, the Barracudas have been accepted for full membership into the Central Maryland Swim League, and we have a full slate of Swim Meets!

Practices start on Tuesday, June 1 and the last scheduled meet will be on July 25th. Individual Championships will be held on July 28.

Practice Schedule:

Age 8 & Under

Monday-Thursday; 5:30-6:15pm

(No practice on Thursdays when meets are scheduled.)

Age 9 & Older

Monday-Thursday; 6:15-7:15pm

(No practice on Thursdays when meets are scheduled.)

Fee: \$100

Stay tuned for June/July Swim Meet Schedule.

**To register, call Coach Audrey: 410.356.5200, x319
or swimteam@jcc.org.**



Safe Water Initiative: Maryland (SWI:M)

Monday, May 24-Thursday, May 27

The JCC of Greater Baltimore's award-winning water safety program returns during the week leading up to Memorial Day led by none other than the Barracudas' Coach Audrey. With support for the program from the USA Swimming Foundation and corporate sponsors Enterprise vehicle rentals and American Pools, we can teach a lot of people who have never learned to swim!

More info can be found at www.jcc.org/SWIM.

Get ready for summer at the Rec Park

Pool Safety & Etiquette

We want all of our members to enjoy a safe and pleasant summer at the pool. This means following some important rules and being considerate of other members. While all of our Pool Rules are important, the following bear repeating each year.

- Children ages 8 and under who are in, or near, the water, must be actively supervised by an adult or guardian within arms reach
- Bathers should rinse off in a shower before entering the pool
- Running, dunking, pushing, or throwing persons into the pool is not permitted. No horseplay, riding on shoulders, excessive splashing or dunking allowed.
- Non-swimmers must stay in the shallow water
- Look before you leap! Diving is only permitted in water deeper than nine feet. Please be aware of what (or who) may be beneath you when entering the water.
- Prolonged underwater swimming or breath holding is not allowed.

For more information on these Aquatics programs, contact **Bill Kirkner: 410.356.5200, x318 or bkirkner@jcc.org**



Aquatics

NEW Adult Classes for Summer

Deep Water Aerobics

Ages 21+ years.

Tuesdays & Thursdays June 21-August 31; 7:00-7:45pm

Rosenbloom OM JCC (Indoor Pool)

Deep water training, conditioning workout using hydro-belts and water barbells.

\$75/JCC Member; \$110/NM

Noodle Water Aerobics

Mondays & Wednesdays, June 21-July 31; 7:00-7:45

Rosenbloom OM JCC (Indoor Pool)

Learn how to use the Noodle for added buoyancy and perfect positioning for powerful aerobic movements for the lower body. Get an awesome water aerobic workout plus strengthening and toning for the upper and lower body. No swimming skills required.

\$75/JCC Member; \$110/NM

For more information on these classes, contact Sue at 410.356.5200 x302 or email sszembroth@jcc.org.

Aquatics Leadership Camp

Limited Openings Available for Second Session Only

July 19 - July 30

There are still a few spots available for both Aquatic Adventure Camp (for swimmers ages 11-14) and Aquatic Leadership Adventure (for swimmers ages 15-18). Camps will include mornings with water safety and rescue skills (including First Aid and CPR). Afternoon programs will offer aquatics skills like navigation, snorkeling and SCUBA, communication and boating. Campers must pass a swim test in order to register.

Contact Bill Kirkner at 410.356.5200 x318 or email blrkner@jcc.org.

June Certification Classes

Lifeguarding and Water Safety Instructor (WSI) classes are in progress and there's still time to obtain certification before summer swim season begins.

Visit www.jcc.org/lifeguard and www.jcc.org/wsi for more information.



Paige Berman (3rd from L) and friends swam laps in the indoor pool in Owings Mills to help raise funds to fight breast cancer.



New Session Just Announced! Safe Water Initiative: Maryland

Monday-Thursday, June 14-17

The JCC of Greater Baltimore's award-winning water safety program returns during the week leading up to Memorial Day led by none other than the Barracudas' Coach Audrey. With support for the program from the USA Swimming Foundation and corporate sponsors Enterprise vehicle rentals and American Pools, we can teach a lot of people who have never learned to swim!

More info can be found at www.jcc.org/SWIM.

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Appendix D: Parent Water Safety Handout



Summer Water Safety Recommendations For Parents

THE PROBLEM: While summer water recreation provides hours of enjoyment and exercise, water and children can be a deadly mix when a lack of safety skills, inadequate supervision, or improperly used swimming gear are also present.

Key Facts:

- ✓ Drowning is one of the **leading causes of death** due to accidental injury in children and adolescents of all ages, and one of the leading causes of **ALL** deaths in children ages 1-9.
- ✓ In the summer months (May-August), drowning deaths among children **increase 89 percent** over the rest of the year.
- ✓ A national study found that a parent or caregiver **claimed to be supervising the child** in nearly 9 out of 10 child drowning-related deaths.

Parents' Steps for Success:

Help your child learn to swim. It's been shown that swimming lessons improve swimming ability and can protect against drowning. Children are highly sensitive to training, so they are able to retain and develop most skills if lessons are provided consistently. It's never too early *OR* too late to learn how to swim! Swimming lessons include education on water safety measures and survival skills that will be useful in an emergency. And whether you like to swim yourself or not, it's important that your child learns those critical skills. Parents' encouragement and support for water safety has been shown to have a significant effect on children learning to swim and feeling comfortable in the water.

Don't rely on flotation devices. Air-filled "water wings," inner tubes, and flotation bathing suits are supposedly a quick and easy way to for kids to enjoy water activities without needing to know how to swim. But these swimming aids are not approved as safety devices to protect against drowning, and should never be used as such. Any child who does not know how to swim or float should be within an arms' reach of an adult supervisor at ALL times. It's also important to realize that relying on these swimming aids may give children false confidence in their own abilities, and could delay their learning when it comes time to learn to swim. As a parent, you need to make sure that your child has the underlying skills that can prevent a drowning or near-drowning experience.

Be an ACTIVE supervisor. Don't assume that just because your child took swimming lessons or is using a flotation device that there is no drowning risk. Never allow children to swim without adult supervision. A responsible adult should always be designated a "water-watcher" whose sole responsibility is to stay in close proximity and constantly observe children in or near the water. Supervisors should not engage in distracting behaviors such as talking with others, preparing snacks, or reading. It's smart to have a phone with you in case of an emergency, but if you receive a call while you're supervising, keep the conversation brief to prevent from being distracted. In water emergencies, seconds count!

Sources:

- o Centers for Disease Control and Prevention. Web-based Injury Statistics Query and Reporting System (WISQARS). www.cdc.gov/injury/wisqars/index.html
- o Coody BE, Quraishi AY, Dastur MC, Mckalide AD. Clear Danger: A national study of childhood drowning and related attitudes and behaviors. Washington (DC): National SAFE KIDS Campaign. April 2004.
- o Irwin, C.C., Irwin, R.L., & Ryan, T.D., et al. (2009). Urban minority youth swimming (in)ability in the United States and associated demographic characteristics: toward a drowning prevention plan. *Injury Prevention, 15*, 234-239.
- o Safe Kids Worldwide. Child Unintentional Injury Deaths, 2001-2004. Safe Kids U.S. Summer Safety Ranking

Appendix E: Program Registration Confirmation E-mail

Your application for participation in the Safe Water Initiative: Maryland (SWI:M) free swim lessons program has been accepted. Please note the following registration information to confirm your class times:

| First Name | Last Name | Birthdate | Age | Time |
|------------|-----------|-----------|-----|------|
| | | | | |
| | | | | |

- Classes will be held at the same time Monday, Tuesday, Wednesday, and Thursday June 14-17, 2010. As the number of classes is limited, please try to attend all four sessions.

- When you arrive, please come to the front gate of the Shapiro Recreation Park. You can get to the front gate of the Rec Park by bearing to your left when entering the grounds of the Rosenbloom Owings Mills JCC. Please park in the lot near the tennis courts.

- We are planning to hold these classes in our outdoor pools. As it is still early in the season, you may want to bring a tight-fitting t-shirt or "rash guard" to wear during lessons. (Loose fitting shirts will cause drag that will make it difficult to practice swimming.) Swim caps might also be a good idea as these will also help keep your warm during lessons.

- As the time allotted for each lesson is limited, we ask that you arrive 10-15 minutes prior to your lesson, and be ready to begin your lesson at the designated time.

- If your schedule changes and you will not be able to participate, please notify Bren Larkin at MakeASplashJCC@gmail.com so we may open up your slot to another applicant.

This year, we will be carefully evaluating our program so that we know how to improve it for the future. This is also an exciting opportunity to provide information to other swim clubs around the country that are working on developing their own learn-to-swim programs. To help us with the evaluation process, we have partnered with individuals from the School of Public Health at the University of Maryland, College Park. They have put together a few brief surveys for you to fill out about your thoughts on issues related to water safety and swimming instruction. Please note that your participation in this process has no impact on your child's participation in our program – your child can still participate in all of the lessons whether or not you complete the surveys. However, we would like to encourage parents to participate. Besides learning more about water safety, you will receive prizes for completing the surveys!

In the next week or so, be on the lookout for an e-mail about the evaluation coming from the following email address: swimevaluationicc@gmail.com. That e-mail will be sent directly by the individuals at the University of Maryland, and will provide you with more details about the evaluation process. Thank you in advance for your participation!

Bren Larkin
SWI:M Coordinator
JCC Owings Mills

Appendix F: Study Recruitment E-mails



JCC Swim Evaluation <swimevaluationjcc@gmail.com>

SWI:M Survey Information!

JCC SWI:M Lessons Evaluation <swimevaluationjcc@gmail.com>

Sat, Jun 12, 2010 at
5:30 PM

To: JCC Swim Evaluation <swimevaluationjcc@gmail.com>

Hello SWI:M Program Parent/Guardian:

This e-mail is being sent to all parents/guardians of children registered for the upcoming free swimming lessons program (Safe Water Initiative: Maryland - SWI:M) at the JCC in Owings Mills. A few days ago, you should have received an e-mail directly from the program confirming your/your child's acceptance and time slot for the swimming lessons.

As mentioned in the confirmation e-mail, a very important part of the program is the evaluation process that the program is doing. As part of my Master's degree in Public Health at the University of Maryland, I am trying to help the SWI:M program evaluate its success by examining where parents stand on a variety of swimming and water safety issues. To do so, I am asking the parents/guardians of the all children participating in these swim lessons to complete three (3) short, anonymous surveys.

The first two surveys are written surveys that will be completed at the JCC pool on the first and last day of your/your child's lessons, and the final survey will be e-mailed to you later this summer. Each survey will take no more than 10 minutes to complete. Participation is voluntary, and does not impact your child's ability to participate in the SWI:M program. The responses you give will be completely anonymous and confidential, and no one will be able to identify you from your responses. You will receive swimming-related educational materials and gifts for your kids as a token of our appreciation for your time.

Your participation in these surveys is really appreciated by both me and by the SWI:M program. No other swimming lessons program in the country is conducting the same sort of research. Your responses will help the program learn how to improve for next year, and also help other clubs around the country design their own free swimming lesson programs.

The attached study information sheet provides you with more details about the survey procedures. This information sheet is for you to read and keep – you do not have to sign it. Completion of the surveys will imply your consent to participate.

Please feel free to e-mail me back if you have any questions at all about the survey process. Thank you in advance for your participation, and I look forward to seeing you at the pool!

—

Erinn Monteiro
School of Public Health, University of Maryland
on behalf of the JCC of Greater Baltimore SWI:M Program

 StudyInfoSheet.doc
64K

Appendix G: Study Information Sheet

Page 1 of 2

STUDY INFORMATION SHEET

| | |
|------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Project Title | Evaluation of the Safe Water Initiative: Maryland (SWI:M) Program |
| Why is this research being done? | This is a research project being conducted by Erinn Monteiro under the guidance of Dr. Kerry Green at the University of Maryland, College Park. We are asking you to participate in this research project because you are the parent or guardian of a child registered to participate in the Safe Water Initiative: Maryland (SWI:M) free swimming lessons program at the Jewish Community Center of Greater Baltimore in the summer of 2010. The purpose of this research project is to learn more about how parents feel regarding swimming and water safety. |
| What will I be asked to do? | The procedures involve completing 3 short surveys about your opinions on a variety of water safety issues. The first survey, completed on the first day of your child's lesson, should take you approximately 10 minutes to complete. The second survey, completed on the last day of your child's lesson, should take you approximately 5 minutes to complete. You will receive water safety educational materials and swimming-related gifts for you and your child during the week as a token of our appreciation for your time and feedback on these surveys. The third survey will be e-mailed to you approximately 5 weeks after the program ends, and should take less than 5 minutes to complete. To help us collect the information we need, we may ask you to complete the third survey over the phone if you do not or are unable to complete the third survey via e-mail. |
| What about confidentiality? | We will do our best to keep your information confidential. All survey data will be stored in a locked filing cabinet in a locked office at the University of Maryland. All data will be destroyed (i.e., shredded) when its use is no longer needed, but will be kept for a minimum of ten years. The surveys are anonymous and will not contain any information that may personally identify you. Your name will not be placed on any of the surveys you complete. Instead, you will be asked to provide your year of birth and last 4 digits of your phone number on each questionnaire, in order to create a unique identification code. The code will be used to match your 3 surveys answered at different points in time. If we write a report or article about this research project, your identity will be protected to the maximum extent possible. Your information may be shared with representatives of the University of Maryland, College Park or governmental authorities if you or someone else is in danger or if we are required to do so by law. |
| What are the risks of this research? | There are no known risks associated with participating in this research project. |
| What are the benefits of this research? | The benefits to you include gaining important knowledge about water safety and swimming instruction. The knowledge you gain may motivate you to seek additional information about these topics and/or change your behavior. You will also be contributing to an important evaluation and your participation may help provide feedback and improve the program in the future. Benefits to society include an improved drowning-prevention program at the community level. This research project also has the potential to impact the development of other learn-to-swim programs at the national level. |

| | |
|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Project Title | Evaluation of the Safe Water Initiative: Maryland (SWI:M) Program |
| Do I have to be in this research? May I stop participating at any time? | Your participation in this research is completely voluntary. You may choose not to take part at all. If you decide to participate in this research, you may stop participating at any time. If you decide not to participate in the surveys or if you stop participating at any time, you will not be penalized or lose any benefits to which you otherwise qualify. Your participation in this research project has no impact on your child's participation in the SWI:M program. |
| What if I have questions? | This research is being conducted by Erinn Monteiro under the guidance of Dr. Kerry Green at the University of Maryland, College Park School of Public Health. If you have any questions about the research study itself, please contact Dr. Kerry Green at the University of Maryland, College Park, 2375 SPH Building, 301-405-2524 or greenkm@umd.edu . If you have questions about your rights as a research subject or wish to report a research-related injury, please contact: Institutional Review Board Office, University of Maryland, College Park, Maryland, 20742; (e-mail) irb@umd.edu; (telephone) 301-405-0678. This research has been reviewed according to the University of Maryland, College Park IRB procedures for research involving human subjects. |
| Statement of Age of Participant and Consent | Participation in these surveys indicates that: <ul style="list-style-type: none"> • you are at least 18 years of age; • the research has been explained to you; • your questions have been fully answered; and • you freely and voluntarily choose to participate in this research project. |

Appendix H: Pretest (Survey 1)

Safe Water Initiative: Maryland (SWI:M) Participant Demographics

Do not write your name on this survey. Instead, please provide the following information that will be used to identify your surveys with a unique ID code:

- 4-digit YEAR OF YOUR BIRTH: _____
- Last 4 digits of YOUR CELL PHONE NUMBER: _____ (if you do not have a cell phone, use whatever you consider to be your primary phone number)

Unless otherwise specified, provide only one response for each question below. All answers are anonymous and confidential.

1. Are you a JCC member? Yes No
2. Age(s) of child(ren) enrolled in the SWI:M program: _____
3. What is your relationship to the child enrolled in the SWI:M program?
 - Mother (or mother figure, such as stepmother)
 - Father (or father figure, such as stepfather)
 - Grandparent
 - Other family member
 - Other non-family member
4. Are you also participating in the SWI:M program? Yes No
5. In the summer months, how often does your family visit swimming pools?
 - Never/very rarely
 - Rarely (about 1-2 times per month)
 - Sometimes (3-4 times per month)
 - Frequently (more than 4 times per month)
6. In non-summer months, how often does your family visit swimming pools?
 - Never/very rarely
 - Rarely (about 1-2 times per month)
 - Sometimes (3-4 times per month)
 - Frequently (more than 4 times per month)
7. What is your age?

| | | |
|-----------------------------------|-----------------------------------|-----------------------------------|
| <input type="checkbox"/> Under 25 | <input type="checkbox"/> 36 to 40 | <input type="checkbox"/> 51 to 55 |
| <input type="checkbox"/> 25 to 30 | <input type="checkbox"/> 41 to 45 | <input type="checkbox"/> 56 to 60 |
| <input type="checkbox"/> 31 to 35 | <input type="checkbox"/> 46 to 50 | <input type="checkbox"/> Over 60 |
8. What is your sex? Male Female
9. What is your race?
 - White
 - Black/African-American
 - Asian/Asian-American
 - American Indian/Alaska Native
 - Native Hawaiian/Other Pacific Islander
 - More than one race
10. What is your ethnicity?
 - Hispanic/Latino
 - Not Hispanic/Latino
11. What is the highest degree or level of education you have completed?
 - Some or no high school
 - High school diploma/GED
 - College or technical school degree
 - Graduate degree
12. What is your annual household income?
 - Less than \$25,000
 - \$25,000 to \$49,999
 - \$50,000 to \$74,999
 - \$75,000 to \$99,999
 - \$100,000 or more
13. How would you rate your own swimming ability?
 - Unable to swim
 - Can swim a little, but not comfortable in deep water
 - Comfortable in deep water, but cannot swim very long
 - Able to swim for an extended period of time
 - Swim competitively (or could) and for an extended period of time
14. What are the reasons your child has never received formal swimming lessons? (Check ALL that apply)
 - You did not know how to find information about swimming lessons
 - Finding transportation to swimming lessons can be a problem
 - The equipment needed to swim (suit, towel, goggles, etc.) is too expensive
 - Lessons cost too much money
 - Your child did not ever want to take lessons
 - Your child is too busy
 - You are too busy
 - You did not consider swimming lessons to be a high priority
 - Other (please describe): _____

Safe Water Initiative: Maryland (SWI:M) Pre-Program Questionnaire

Instructions: For each statement below, circle the number to the right that best indicates your level of agreement with that statement, as you feel TODAY. Do not worry about "right" or "wrong" answers or what you think we want to hear – we want to know how you truly feel about these issues. Your honest responses will help us the most. Thank you!

| Statement | Level of Agreement | | | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|----------|-------|----------------|
| | Strongly Disagree | Disagree | Agree | Strongly Agree |
| 1) I feel comfortable being around a pool with my child. | 1 | 2 | 3 | 4 |
| 2) When my child is around a pool, I worry about him/her drowning. | 1 | 2 | 3 | 4 |
| 3) I am afraid of drowning or being injured when I am in the water. | 1 | 2 | 3 | 4 |
| 4) I am afraid of my child drowning or being injured when he/she is in the water. | 1 | 2 | 3 | 4 |
| 5) I believe it is important for my child to learn to swim. | 1 | 2 | 3 | 4 |
| 6) It is important for me as a parent/guardian to know child CPR. | 1 | 2 | 3 | 4 |
| 7) I know child CPR and could perform it in an emergency. | 1 | 2 | 3 | 4 |
| 8) When a lifeguard is present, he/she is the main person responsible for supervising swimmers. | 1 | 2 | 3 | 4 |
| 9) I should always supervise my child when he/she is in the water. | 1 | 2 | 3 | 4 |
| 10) When I supervise my child swimming, I should always be in the water with him/her within arms' reach. | 1 | 2 | 3 | 4 |
| 11) While I supervise my child swimming, I should not do other things at the same time such as eat, read, talk with other parents, or talk on the phone. | 1 | 2 | 3 | 4 |
| 12) It is okay for my child to swim without me if he/she is a good swimmer. | 1 | 2 | 3 | 4 |
| 13) It is okay for my child to swim without me if he/she swims with a buddy. | 1 | 2 | 3 | 4 |
| 14) It is okay for my child to swim without me if he/she stays in shallow water. | 1 | 2 | 3 | 4 |
| 15) It is okay for my child to swim without me if he/she uses a life jacket. | 1 | 2 | 3 | 4 |
| 16) It is okay for my child to swim without me if he/she uses an air-filled flotation device such as "water wings" or inner tubes. | 1 | 2 | 3 | 4 |
| 17) Using flotation devices are a good way to teach my child to swim. | 1 | 2 | 3 | 4 |
| 18) I would like for my child to take additional swimming lessons. | 1 | 2 | 3 | 4 |
| 19) I intend to sign up my child for additional swimming lessons this summer. | 1 | 2 | 3 | 4 |
| 20) I am willing to pay for swimming lessons for my child. | 1 | 2 | 3 | 4 |
| 21) If I qualified financially, I would be interested in receiving a JCC scholarship for swimming lessons. | 1 | 2 | 3 | 4 |

Appendix I: First Posttest (Survey 2)

Safe Water Initiative: Maryland (SWI:M) Post-Program Questionnaire

- 1) Please provide the following information so we can identify your surveys with a unique ID code:
- 4-digit YEAR OF YOUR BIRTH: _____
- Last 4 digits of YOUR CELL PHONE NUMBER: _____
 _____ (if you do not have a cell phone number, use your primary phone number)
- 2) What is your relationship to the child enrolled in the SWI:M program?
- Mother (or mother figure)
- Father (or father figure)
- Grandparent
- Other family member
- Other non-family member

Instructions: For each statement below, circle the number to the right that best indicates your level of agreement with that statement, as you feel TODAY. Do not worry about "right" or "wrong" answers or what you think we want to hear – we want to know how you truly feel about these issues. Your honest responses will help us the most. Thank you!

| Statement | Level of Agreement | | | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|----------|-------|----------------|
| | Strongly Disagree | Disagree | Agree | Strongly Agree |
| 1) I feel comfortable being around a pool with my child. | 1 | 2 | 3 | 4 |
| 2) When my child is around a pool, I worry about him/her drowning. | 1 | 2 | 3 | 4 |
| 3) I am afraid of drowning or being injured when I am in the water. | 1 | 2 | 3 | 4 |
| 4) I am afraid of my child drowning or being injured when he/she is in the water. | 1 | 2 | 3 | 4 |
| 5) I believe it is important for my child to learn to swim. | 1 | 2 | 3 | 4 |
| 6) It is important for me as a parent/guardian to know child CPR. | 1 | 2 | 3 | 4 |
| 7) I know child CPR and could perform it in an emergency. | 1 | 2 | 3 | 4 |
| 8) When a lifeguard is present, he/she is the main person responsible for supervising swimmers. | 1 | 2 | 3 | 4 |
| 9) I should always supervise my child when he/she is in the water. | 1 | 2 | 3 | 4 |
| 10) When I supervise my child swimming, I should always be in the water with him/her within arms' reach. | 1 | 2 | 3 | 4 |
| 11) While I supervise my child swimming, I should not do other things at the same time such as eat, read, talk with other parents, or talk on the phone. | 1 | 2 | 3 | 4 |
| 12) It is okay for my child to swim without me if he/she is a good swimmer. | 1 | 2 | 3 | 4 |
| 13) It is okay for my child to swim without me if he/she swims with a buddy. | 1 | 2 | 3 | 4 |
| 14) It is okay for my child to swim without me if he/she stays in shallow water. | 1 | 2 | 3 | 4 |
| 15) It is okay for my child to swim without me if he/she uses a life jacket. | 1 | 2 | 3 | 4 |
| 16) It is okay for my child to swim without me if he/she uses an air-filled flotation device such as "water wings" or inner tubes. | 1 | 2 | 3 | 4 |
| 17) Using flotation devices are a good way to teach my child to swim. | 1 | 2 | 3 | 4 |
| 18) I would like for my child to take additional swimming lessons. | 1 | 2 | 3 | 4 |
| 19) I intend to sign up my child for additional swimming lessons this summer. | 1 | 2 | 3 | 4 |
| 20) I am willing to pay for swimming lessons for my child. | 1 | 2 | 3 | 4 |
| 21) If I qualified financially, I would be interested in receiving a JCC scholarship for swimming lessons. | 1 | 2 | 3 | 4 |

Appendix J: Second Posttest (Survey 3)

JCC Free Swim Select & Zoom Lesson Program -- Follow-Up Survey

Hi Parents/Guardians! This is a follow-up survey about the Safe Water Initiative: Maryland free swimming lessons program that your child participated in at the JCC in Owings Mills in May, 2010. You already completed one or two surveys during that week of lessons. This third and FINAL survey is very important, as it will help us look at the impact of the program. It is short and will only take a few minutes to complete!

CLICK THE LINK BELOW to access the survey.

Thanks so much for your participation - I truly appreciate it!

Erinn Monteiro
University of Maryland School of Public Health
On behalf of the JCC Owings Mills SWI:M program

* Required

1. What is the 4-digit year of YOUR birth? *

This is the first part of the Participant ID code that you provided on your previous surveys. Please write your 4-digit year of birth (e.g., 1971).

What are the LAST 4 digits of your home phone number? *

This is the second part of the Participant ID code that you provided on your previous surveys. Please write the last 4 digits of your home phone number. If you do not have a home phone number, please write the last 4 digits of your cell phone number.

2. Please provide your email address. *

Your email address will only be used to confirm that you responded to the survey. It will not be associated with your responses in any way.

3. What is your relationship to the child(ren) you enrolled in the SWI:M program? *

Choose the best answer.

Mother (or mother figure, such as stepmother) *

4. Since the SWI:M program ended, have you taken your child(ren) swimming? *

Choose the best answer.

Yes *

5. Have you changed the way you provide supervision to your child(ren) in the water as a result of the SWI:M program? *

Choose the best answer.

Yes

Why or why not?

Please explain why you did or did not change the way you provide supervision.

6. Since the SWI:M program ended, has your child(ren) had any swimming lessons? *

Choose the best answer.

Yes

Why or why not?

Please explain why your child(ren) has or has not had any additional swimming lessons.

7. What is the nature of the swimming lessons your child(ren) has had since the SWI:M program ended? *

Choose the best answer.

My child took GROUP swimming lessons and I (or another member of the family) paid full-price for them.

8. Do you intend for your child(ren) to take (or continue to take) formal swimming lessons in the future? *

Choose the best answer.

Yes

Why or why not?

Explain why you do or do not intend for your child(ren) to take additional swimming lessons.

5. Have you changed the way you provide supervision to your child(ren) in the water as a result of the SWI:M program? *

Choose the best answer.

Yes

Why or why not?

Please explain why you did or did not change the way you provide supervision.

6. Since the SWI:M program ended, has your child(ren) had any swimming lessons? *

Choose the best answer.

Yes

Why or why not?

Please explain why your child(ren) has or has not had any additional swimming lessons.

7. What is the nature of the swimming lessons your child(ren) has had since the SWI:M program ended? *

Choose the best answer.

My child took GROUP swimming lessons and I (or another member of the family) paid full-price for them.

8. Do you intend for your child(ren) to take (or continue to take) formal swimming lessons in the future? *

Choose the best answer.

Yes

Why or why not?

Explain why you do or do not intend for your child(ren) to take additional swimming lessons.

9. What did you like most about the SWI:M program offered at the JCC?

10. Is there anything you didn't like about the program?

11. If the JCC were to offer free swimming lessons again next summer, do you have any suggestions for improving the program?

If you are finished, please click the "Submit" button below. Thank you so much for your participation! Keep staying safe in the water!

Appendix K: IRB Approvals



0101 Lee Building
College Park, Maryland 20742-5125
301.405.4212 TEL 301.314.1475 FAX
irb@deans.umd.edu
www.umresearch.umd.edu/IRB

May 03, 2010

MEMORANDUM

Application Approval Notification

To: Dr. Kerry Green
Erinn Monteiro
Public and Community Health

From: Joseph M. Smith, MA, CIM *MS*
IRB Manager
University of Maryland, College Park

Re: **IRB Application Number:** 10-0253
Project Title: "Evaluation of Safe Water Initiative: Maryland (SWI:M) Program"

Approval Date: May 03, 2010

Expiration Date: May 03, 2013

Type of Application: Initial

Type of Research: Exempt

Type of Review for Application: Exempt

The University of Maryland, College Park Institutional Review Board (IRB) approved your IRB application. The research was approved in accordance with the University IRB policies and procedures and 45 CFR 46, the Federal Policy for the Protection of Human Subjects. Please include the above-cited IRB application number in any future

Addendum Application Approval Notification

To: Principal Investigator, Dr. Kerry Green, Public and Community Health
Student, Erinn Monteiro, Public and Community Health

From: James M. Hagberg
IRB Co-Chair
University of Maryland College Park

Re: IRB Protocol: 10-0253 - Evaluation of Safe Water Initiative: Maryland
(SWI:M) Program

Approval Date: May 03, 2010

Expiration
Date: May 03, 2013

Application: Initial

Review Path: Exempt

The University of Maryland, College Park Institutional Review Board (IRB) Office approved your Initial IRB Application. This transaction was approved in accordance with the University's IRB policies and procedures and 45 CFR 46, the Federal Policy for the Protection of Human Subjects. Please reference the above-cited IRB Protocol number in any future communications with our office regarding this research.

Recruitment/Consent: For research requiring written informed consent, the IRB-approved and stamped informed consent document will be sent via mail. The IRB approval expiration date has been stamped on the informed consent document. Please note that research participants must sign a stamped version of the informed consent form and receive a copy.

Continuing Review: If you intend to continue to collect data from human subjects or to analyze private, identifiable data collected from human subjects, beyond the expiration date of this protocol, you must [submit a Renewal Application](#) to the IRB Office 45 days prior to the expiration date. If IRB Approval of your protocol expires, all human subject research activities including enrollment of new subjects, data collection and analysis of identifiable, private information must cease until the Renewal Application is approved. If work on the human subject portion of your project is complete and you wish to close the protocol, please [submit a Closure Report](#) to irb@umd.edu.

Modifications: Any changes to the approved protocol must be approved by the IRB before the change is implemented, except when a change is necessary to eliminate an apparent immediate hazard to the subjects. If you would like to

modify an approved protocol, please [submit an Addendum request](#) to the IRB Office.

Unanticipated Problems Involving Risks: You must promptly report any unanticipated problems involving risks to subjects or others to the IRB Manager at 301-405-0678 or jsmith@umresearch.umd.edu

Additional Information: Please contact the IRB Office at 301-405-4212 if you have any IRB-related questions or concerns. Email: irb@umd.edu

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0101 Lee Building
College Park, MD 20742-5125
TEL 301.405.4212
FAX 301.314.1475
irb@umd.edu
<http://www.umresearch.umd.edu/IRB>

Appendix L: Key Variables, Research Questions, and Analytic Approach

| KEY VARIABLE | RESEARCH QUESTIONS | HOW ANALYZED |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| BARRIERS | RQ#1: What were the most common barriers that prevented parents from seeking swimming instruction for their children prior to the SWI:M program? | Frequencies of participants reporting each barrier |
| | RQ#2: Are any barriers associated with lower perceived susceptibility of drowning? | Independent samples t-tests (DV: mean pretest scores on <i>Drowning Susceptibility Scale</i> , IV: each barrier) |
| | RQ#3: Are any barriers associated with less favorable attitudes and beliefs about swimming importance? | Independent samples t-test (DV: mean pretest scores on <i>Swimming Importance Attitudes and Beliefs Scale</i> , IV: each barrier) |
| | RQ#4: What demographic characteristics are associated with barriers? | Pearson chi-square for each barrier (yes/no) and demographic variables (Fisher's exact test used for 2x2 comparisons) |
| ATTITUDES AND BELIEFS | RQ#5: How did parents' attitudes and beliefs about swimming importance change from pretest to posttest? | Paired t-tests (pretest/first posttest) of mean scores on <i>Swimming Importance Attitudes & Beliefs Scale</i> |
| | RQ#6: How are parents' attitudes and beliefs about swimming related to their intentions to enroll their children in lessons? | Linear regression (DV: intention scores, IV: mean scores on <i>Swimming Importance Attitudes and Beliefs Scale</i>) for pretest and first posttest |
| | RQ#7: What demographic characteristics predict more favorable attitudes and beliefs? | Linear regression (DV: mean scores on <i>Swimming Importance Attitudes and Beliefs Scale</i> at pretest, IV: each demographic variable) |
| | RQ#8: What demographic characteristics are associated with parents whose attitudes and beliefs increased the most from pretest to posttest? | One-way ANOVA (DV: pre-post change on <i>Swimming Importance Attitudes and Beliefs Scale</i> , IV: each demographic variable) |
| | RQ#9: How did parents' perceived susceptibility of drowning change from pretest to posttest? | Paired t-tests (pretest/first posttest) of mean scores on <i>Drowning Susceptibility Scale</i> |
| | RQ#10: How is parents' perceived susceptibility related to their attitudes and beliefs about swimming importance? | Pearson correlations of scores at pretest and posttest |
| PERCEIVED SUSCEPTIBILITY | RQ#11: How is parents' perceived susceptibility about drowning related to their intentions to enroll their children in lessons? | Linear regression (DV: intention scores, IV: mean scores on <i>Drowning Susceptibility Scale</i>) for pretest and posttest |
| | RQ#12: What demographic characteristics predict higher perceived susceptibility? | Linear regression (DV: mean scores on <i>Drowning Susceptibility Scale</i> at pretest, IV: each demographic variable) |

| | | |
|------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | RQ#13: What demographic characteristics are associated with parents whose perceived susceptibility increased the most from pretest to posttest? | One-way ANOVA (DV: pre-post change on <i>Drowning Susceptibility Scale</i> , IV: each demographic variable) |
| | RQ#14: How did participants' intentions to seek additional swimming instruction for their children change across the three time points? | Paired t-tests between pretest/first posttest/second posttest to examine changes in means |
| BEHAVIORAL INTENTIONS | RQ#15: How do participants' attitudes/beliefs about swimming importance and perceived susceptibility of drowning predict intentions to enroll children in swimming lessons? | Multiple linear regression (DV: intention scores at posttest, IVs: mean posttest scores on <i>Drowning Susceptibility Scale</i> , mean posttest scores on <i>Swimming Importance Attitudes and Beliefs Scale</i>) |
| | RQ#16: What demographic characteristics predict stronger intentions? | Linear regression (DV: intention scores at pretest, IV: demographic variables) |
| | RQ#17: What demographic characteristics are associated with parents whose intentions increased the most from pretest to posttest? | One-way ANOVA (DV pre-post change in intention scores, IV: each demographic variable) |
| | RQ#18: What proportion of parents had enrolled children in additional lessons at second posttest? | Frequencies |
| BEHAVIOR CHANGE | RQ#19: Did intentions to enroll children in lessons as reported at first posttest predict this behavior? | Logistic regression (DV: lesson enrollment, IV: posttest intentions) |
| | RQ#20: Is enrollment in lessons associated with the degree of change in attitudes and beliefs or perceived susceptibility? | Logistic regression (DV: lesson enrollment, IV: difference of pre-post change on both scales) |
| | RQ#21: What demographic characteristics are associated with parents who did enroll their children in lessons? | Pearson chi-square for lesson enrollment (yes/no) and demographic variable (Fisher's exact test used for 2x2 comparisons) |
| | RQ#22: What proportion of participants had changed their supervision practices at second posttest? | Frequencies |
| | RQ#23: Are changed supervision practices associated with the degree of change in attitudes and beliefs or perceived susceptibility? | Logistic regression (DV: supervision change, IV: differences of pre-post change on both scales) |
| | RQ#24: What demographic characteristics are associated with parents who reported changing their supervision practices? | Pearson chi-square for supervision change (yes/no) and demographic variable (Fisher's exact test used for 2x2 comparisons) |

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