

# The Association between Aquaphobia and Lack of Swimming Ability across Ethnic Groups in the United States

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## BACKGROUND

According to the CDC (2014, 2021), about 4,000 people in the U.S. die from unintentional drowning each year; drowning is the 2<sup>nd</sup> leading cause of unintentional deaths for adolescents; and for every youth who drowns, five additional youth receive care in an emergency department for a nonfatal drowning event. Significant ethnic differences in drowning deaths exist. For example, swimming pool deaths are 5.5 times higher in African American youth compared to White youth and drowning rates in natural water are twice as high in Hispanic youth compared to White youth (CDC, 2014). Ethnic differences in drowning likely map on to ethnic differences in swimming ability. Research (e.g., Berukoff & Hill, 2010; Irwin et al., 2014; Pharr et al., 2018) has found that African-American and Hispanic youth have significant lower swimming abilities compared to White youth and, in turn, their lower abilities are associated with fear of drowning, parental swimming abilities, and lack of swimming opportunities and formal swim lessons. Although 3% of people in the U.S. suffer from aquaphobia (fear of water) (Stinson et al., 2007), to our knowledge, no published studies have examined whether aquaphobia is associated with a lack of swimming ability, nor have researchers examined ethnic differences in aquaphobia and its possible antecedents.

## PURPOSES AND HYPOTHESES

In a national sample of 18- and 19-year-old adolescents across three ethnic/racial groups, we examined fear of water, levels of swimming abilities, factors associated with swimming abilities and the etiology of aquaphobia, and factors comorbid with aquaphobia.

In specific, we expected that:

- Greater fear of water would be significantly associated with lower swimming abilities.
- Mexican American and African American adolescents would report lower swimming abilities and greater fear of water in comparison to White adolescents.
- Mexican American and African American adolescents would report greater levels of factors associated with swimming abilities and aquaphobia, including parental swimming abilities and water fears, access to pools and swimming lessons, and socioeconomic status.
- The relationship between aquaphobia and swimming abilities will be stronger for Mexican American and African American adolescents than for White adolescents.

### Ethnic/Racial Group Comparisons of 18-19 Year Old Adolescents

|   | White<br>(n = 115) | Mexican American<br>(n = 75) | African American<br>(n = 108) |
|---|--------------------|------------------------------|-------------------------------|
| Fear of Water Assessment Questionnaire (FWAQ)   | M = 38.2 (12.0)    | M = 45.8 (10.3)***           | M = 45.2 (10.4)***            |
| Worried about deep end of pool & open water   | M = 0.68 (.77)     | M = 1.15 (.77)***            | M = 1.13 (.78)***             |
| Unreasonable fear of water  | M = 0.26 (.50)     | M = 0.39 (.54)*              | M = 0.31 (.49)                |
| Mother unreasonable fear of water   | M = 0.33 (.64)     | M = 0.64 (.75)**             | M = 0.45 (.69)                |
| Father unreasonable fear of water   | M = 0.19 (.54)     | M = 0.20 (.51)               | M = 0.27 (.58)                |
| Swimming ability  | M = 2.06 (0.8)     | M = 1.47 (0.9)***            | M = 1.57 (1.0)***             |
| Mother swimming ability   | M = 1.83 (0.9)     | M = 1.05 (1.0)***            | M = 1.27 (1.1)***             |
| Father swimming ability   | M = 2.23 (0.8)     | M = 1.73 (1.0)**             | M = 1.77 (1.2)**              |
| Very comfortable with floating, swimming face down, & not touching bottom when swimming | 38.3%              | 17.3%***                     | 15.7%***                      |
| Float on back for 30 seconds & swim pool length   | 80.9%              | 68.0%***                     | 55.6%***                      |
| FWAQ & Swimming ability   | r = -.515          | r = -.687**                  | r = -.532                     |

Notes: \* $p \leq .05$ , \*\* $p \leq .01$ , \*\*\* $p \leq .001$  compared to White group. \* = significant difference of  $p < .05$  compared to White and African American groups. Mean differences were assessed with ANCOVA's, with general anxiety (GAD-7) as covariate, with LSD post-hoc tests. Group differences in percentages were assessed with z-score comparisons of group proportions. Group differences in  $r$  were assessed by transforming  $r$  values into z scores.

## METHODS

### Participants

• 163 eighteen-year-old and 135 nineteen-year-old adolescents from 41 states. **Gender:** 79% female, 18% male, 3% transgender. **Race/Ethnicity:** 38.6% White, 36.2% African American, 25.2% Mexican-American.

### Measures

- **Demographic Form:** Questions on gender, age, education, race/ethnicity, family SES, language use, history of swimming lessons and skills, parent swimming skills, and parent fear of water.
- **Fear of Water Assessment Questionnaire:** Assesses for the presence of aquaphobia (Misimi et al., 2020).
- **Water Fear Assessment Questions** from Poulton et al. (1999) and Graham & Gaffan (1997) to measure unreasonable fear of water and worries about swimming in open water and deep end of pool.
- **Swimming Ability Questions** from Rajeh et al. (2023) and Graham & Gaffan (1997) to measure skill levels of various swimming activities.
- **GAD-7:** Measures general anxiety (Spitzer et al., 2006).
- **PHQ-9:** Measures depressive symptoms (Kroenke et al., 2001).

### Procedure

Data were collected through the Qualtrics XM company. Participants were compensated monetarily at an appropriate level for their time (approximately 15 minutes).

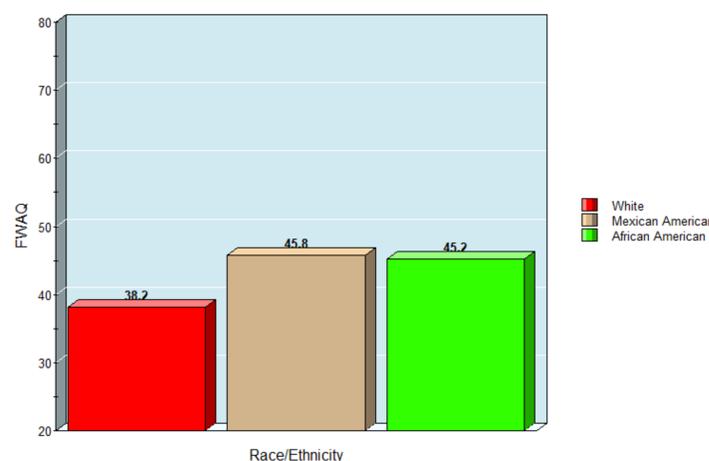
## RESULTS

### Correlations between Variables

|                  | FWAQ    | Deep End & Open Water | Unreasonable Fear of Water |
|------------------|---------|-----------------------|----------------------------|
| Swimming Ability | -.59*** | -.60***               | -.23***                    |
| Swimming Comfort | -.68*** | -.60***               | -.27***                    |
| Swimming Skills  | -.45*** | -.41***               | -.16*                      |
| GAD-7            | .25***  | .15**                 | .33***                     |
| PHQ-9            | .27***  | .19***                | .35***                     |

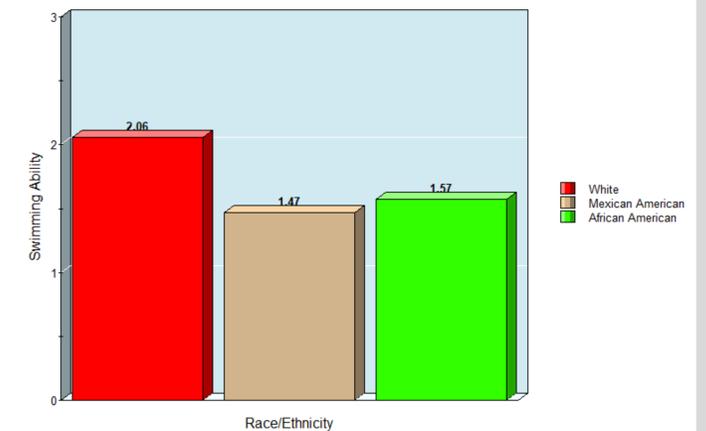
Notes: \* $p \leq .05$ , \*\* $p \leq .01$ , \*\*\* $p \leq .001$ . FWAQ: Fear of Water Assessment Questionnaire. GAD-7: General Anxiety Disorder-7 scale. PHQ-9: Patient Health Depression Questionnaire. Deep End & Open Water: Worries about swimming in deep end of pool and in open body of water. Unreasonable Fear of Water: Strong unreasonable fear of water over the past year. Swimming Ability: Self-perceived swimming ability. Swimming Comfort: Comfort with floating on back, swimming with face down in water, and swimming when you cannot touch bottom. Swimming Skills: Ability to float on back for 30 seconds without help + ability to swim length of pool without flotation device.

### Fear of Water by Race/Ethnicity

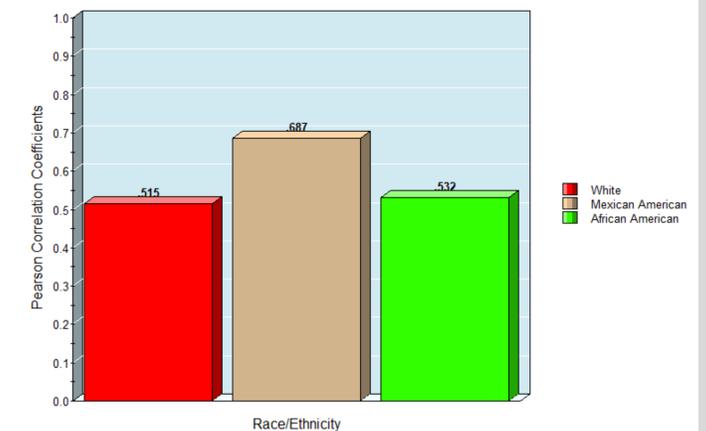


## RESULTS CONTINUED

### Swimming Ability by Race/Ethnicity



### Association of Water Fear & Lack of Swimming Ability



## SUMMARY & CONCLUSIONS

- Fears of water were very strongly associated with swimming abilities.
- The relationship between aquaphobia and perceived swimming ability was significantly stronger in Mexican American adolescents.
- In comparison to White adolescents, Mexican American and African American adolescents reported greater water fears, lower swimming skills, lower perceived swimming ability, and lower parental swimming abilities. Mexican American adolescents reported greater water fear in mothers.
- Our overall findings have important implications as they suggest that the experience of aquaphobia may deter individuals from learning to swim, and that this obstacle is more salient for Mexican American and African American adolescents.
- Our findings point to the importance of developing and implementing effective interventions for individuals suffering from aquaphobia.
- Such interventions would lead to a greater likelihood of aquaphobic individuals learning to swim which, in turn, would help reduce water-related accidents and thus save lives.