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A Comparison of American Red Cross- and YMCA-Preferred Approach Methods Used to Rescue Near-Drowning Victims

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A Comparison of American Red Cross– and YMCA-Preferred Approach Methods Used to Rescue Near-Drowning Victims

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The purpose of this study was to determine the difference in time that it will take a rescuer to swim different distances to a near-drowning victim with a rescue tube, using preferred YMCA and American Red Cross approach methods. The skills that were timed included YMCA and Red Cross approach skills with a rescue tube using the modified breaststroke and front-crawl stroke. Three different events were timed using the two different approach strokes, for a total of 10 trials. It was assumed that the victim in this study was a passive victim facing away from the rescuer. This positioning was adopted to equalize the approach distance for both the YMCA and Red Cross in order to eliminate the requirement of swimming behind the victim in all Red Cross approaches. Because the victim's back was toward the rescuer, the approach method was directly from the rear. A comparison of mean times was also made between the lifeguard and nonlifeguard groups. In four out of five comparisons between Red Cross and YMCA methods, the YMCA method was faster ($p < .05$). It was concluded that the rescue tube resulted in increased water resistance when it was positioned across the rescuer's chest.

Key Words: lifeguarding, lifesaving, rescue and safety equipment, rescues, water safety

Through the years, organizations such as the American Red Cross (ARC) and the YMCA of the USA (YMCA), among others, have developed lifeguard-training courses with specific skill techniques designed to teach lifeguards how to rescue swimmers in distress. Until 1994, approach skills used by these two major aquatic safety agencies required lifeguards to make physical contact with a victim (ARC, 1990; YMCA, 1986).

Lifeguarding techniques were changed dramatically in January 1994 when the YMCA implemented an all-equipment-based rescue system employing a rescue tube and rescue buoy (YMCA, 1994b). The rescue tube provides increased safety for lifeguards and also enables them to begin the assessment of breathing and circulation of an unconscious victim while still in the water. When a rescue tube is attached to a victim, it provides flotation and stability. This permits assessment

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and allows rescue breathing to be started immediately, while in the water (YMCA, 1994a). Bringing the rescue tube along, however, also reduces the speed of a rescuer approaching a victim.

Similar changes were introduced into the ARC lifeguarding program in October 1994 that created questions and concerns about reduced speed and deviations from American Medical Association standards. These concerns were expressed at a national AAHPERD symposium on aquatic risk management held in Atlanta, GA, in April 1996 (Johnson, 1996). The primary approach method introduced by the ARC employs a modified crawl stroke or a modified breaststroke with a rescue tube positioned across the chest. Such an approach can potentially slow lifeguards during their approach to a victim. It is my belief that the primary ARC approach technique is slower than current YMCA approach methods, thereby increasing the swimming rescue time while increasing the victim's risk of brain damage and the potential for death.

In the 1990 ARC lifeguarding program, speed, strength, and endurance were identified as essential lifeguard characteristics during a swimming rescue (ARC, 1990, pp. 6, 8, 13). The YMCA (1994) states that "after you enter the water, you have to get to the victim as soon as possible" (p. 74). The American Medical Association (1986), which sets CPR standards in the United States, says, "When attempting to rescue a near-drowning victim, the rescuer should get to the victim as quickly as possible" (p. 2929). Based on current medical and professional aquatic literature, the speed with which the lifeguard swims to the victim plays an important role in saving lives (AMA, 1992; Modell, 1993).

Although speed is essential to a swimming rescue, it might not have received sufficient emphasis when the primary approach skill was developed for the revised ARC lifeguarding program of 1995. ARC approach skills are almost identical to those used in the Ellis and associates National Pool and Water Park Program, which are intended for rescuing distressed and near-drowning victims in wave pools. Although the Ellis and ARC approach techniques are also adaptable to crowded recreational swimming pools, lap-swimming pools with lane lines, and longer distance swims in open water, a concern of aquatic professionals today is that speed may have been sacrificed in the adoption of the Ellis approach techniques by the ARC (Johnson, 1996).

This experimental study compared the time that it took a rescuer to swim the distance to a drowning victim with a rescue tube using ARC and YMCA approach methods. Thirty-three participants including 15 certified lifeguards and 18 nonlifeguards, between the ages of 16 and 25 years, completed 10 swimming trials over three different events.

Method

Participants

Participants ($N = 33$) were divided into two groups. The first group ($n = 15$) consisted of currently certified YMCA and ARC lifeguards. A second group ($n = 18$) consisted of individuals who demonstrated the entry-level swimming skills necessary to enroll in a lifeguard-training class. Both groups of volunteers included males and females from the local YMCA, college students, and the community. Participants

were admitted to the study based on successful completion of a combined YMCA and ARC precourse swim test for lifeguard candidates. The swimming test administered to all participants consisted of the following four elements, each of which was followed by a recovery period:

- Swimming a distance of 100 yd demonstrating good form using each of the following strokes: front crawl, breaststroke, elementary backstroke, sidestroke, and inverted sidestroke, for a total distance of 500 yd.
- Tread water for a period of 2 min using hands and legs.
- Retrieve a 4.5-kg (10-lb) brick from a depth of 2 m (7 ft).
- Swim underwater a distance of 15 yd with one breath, starting in the water with a push-off.

Method and Materials

A *t* test of statistical significance at the $p < .05$ level was used to determine whether there was a significant difference in the time that it took a rescuer to swim to a victim when using the preferred ARC and YMCA approach methods in 10 different time trials.

Data analysis was completed using the Statistical Package for the Social Sciences (SPSS), release 4.0. Descriptive statistics were used to describe differences in mean times, first for both Technique A and Technique B for all participants and second between the trained (lifeguard) and untrained (nonlifeguard) groups performing the front crawl and the breaststroke. Two-way analysis of variance (ANOVA) was used to test for training and technique. Significance was determined at $p < .05$.

Skills that were timed included YMCA and ARC approach skills with a rescue tube using the modified breaststroke and front-crawl stroke. Three different events were timed using the two different approach strokes, for a total of 10 trials. For the ARC approach method, participants kept the rescue tube under the armpits across the chest, swimming with the head out of the water using the breaststroke and the front crawl. For the YMCA approach method, participants held the rescue tube with one hand positioned at the center of the tube, so the nose of the tube was pointed in the direction that the participant was swimming. A single arm pull and a breaststroke kick were used to swim the modified breaststroke and the modified front crawl. Both the front crawl and the breaststroke were also performed with the participant's head out of the water. The ARC approach methods were referred to as Method A, and the YMCA approach methods were referred to as Method B.

It was assumed that the victim in this study was a passive one facing away from the rescuer. This positioning was adopted to equalize the approach distance for both the YMCA and Red Cross skills in order to eliminate the requirement of swimming behind the victim in all Red Cross approaches. Because the victim's back was toward the rescuer, the approach method was directly from the rear.

Participants began each trial in all three events in the water. They started with their feet against the wall, facing the finish line, holding onto the wall with one hand, and holding the tube with the other hand. At the sound of the horn, participants pushed from the wall and began swimming.

Event 1 consisted of swimming two trials. Participants were asked to swim with a rescue tube in a straight line for a distance of 25 yd (Figure 1). Trial 1 included swimming the front crawl with the rescue tube positioned across the chest under the armpits (Method A). Trial 2 included swimming the front crawl while holding the rescue tube with one hand (Method B).

Event 2 consisted of four different trials, in which participants were asked to swim with a rescue tube a distance of 15 yd, while crossing over five lane dividers in the pool (Figures 2 and 3). Trial 1 consisted of swimming the front crawl with the rescue tube across the chest (Method A). Trial 2 consisted of swimming the front crawl while holding the rescue tube with one hand (Method B). Trial 3 consisted of swimming the breaststroke with the rescue tube across the chest (Method A). Trial 4 consisted of swimming the breaststroke while holding the rescue tube with one hand (Method B).

Event 3 consisted of four different trials in which participants were asked to swim with a rescue tube a distance of 15 yd, around two simulated people (sailing buoys) placed 4 m (14 ft) apart and aligned with each other across the width of the pool (Figures 4 and 5). The touch pad was attached to the wall in a straight line 5 m (15.5 ft) behind the second buoy. Participants swam 5 m (15.5 ft) to the first buoy, passing the first buoy on the left and the second buoy on the right, finally heading for the touch pad located behind the second buoy. Trial 1 consisted of swimming the front crawl with the rescue tube across the chest (Method A). Trial 2 consisted

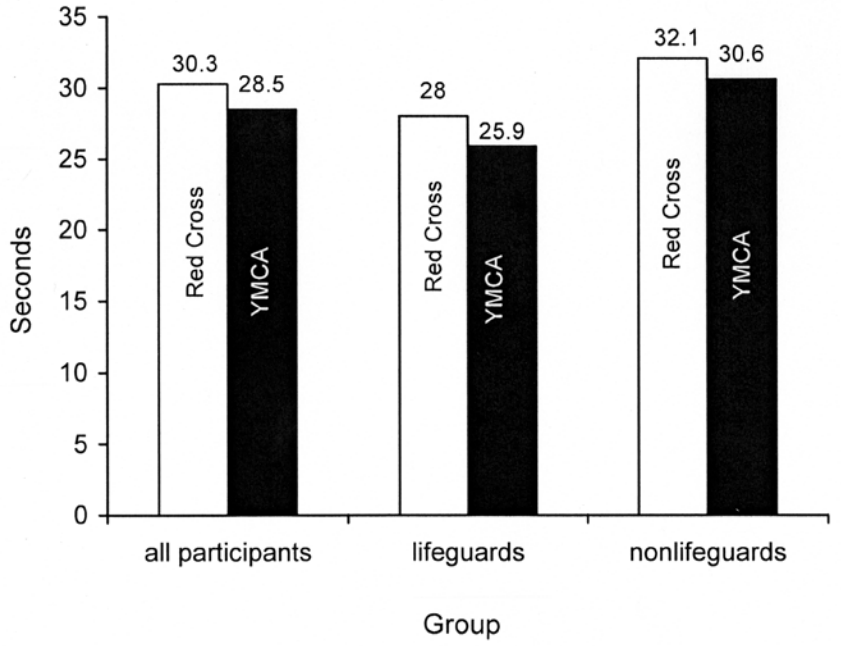

Figure 1 — A comparison of mean times when swimming the front crawl with a rescue tube in a straight line for a distance of 25 yd.

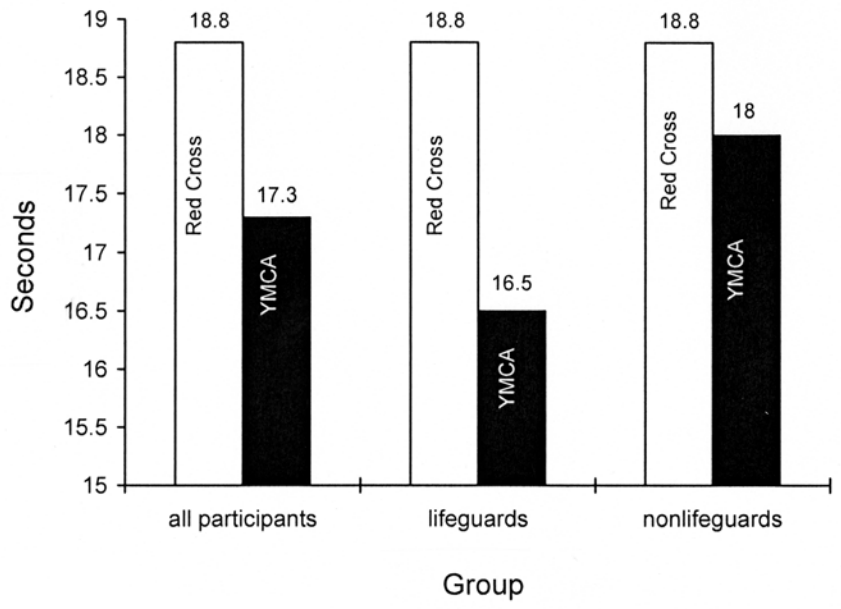

Figure 2 — A comparison of mean times when swimming the front crawl with a rescue tube when crossing over five lane dividers for a distance of 15 yd.

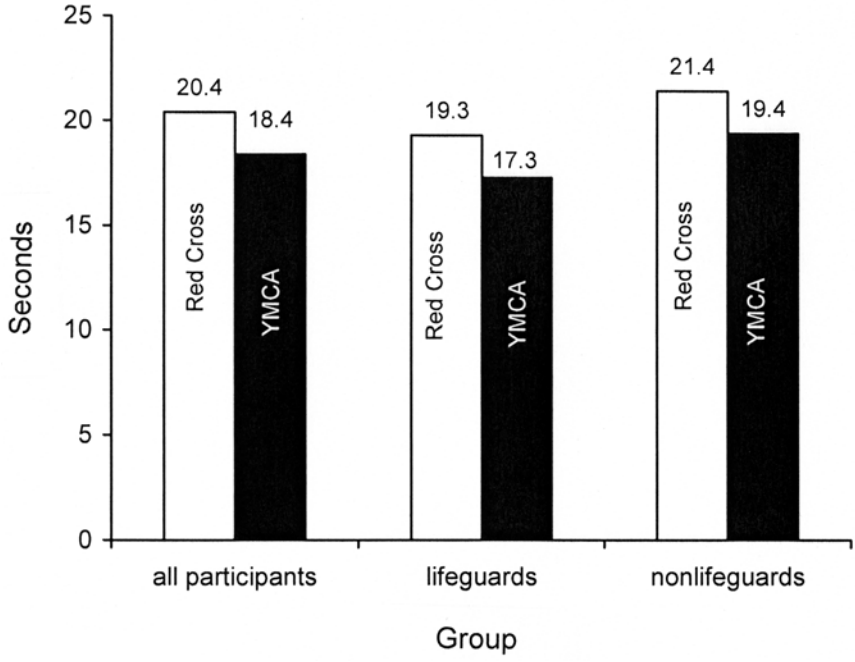

Figure 3 — A comparison of mean times when swimming the breaststroke with a rescue tube when crossing over five lane dividers for a distance of 15 yd.

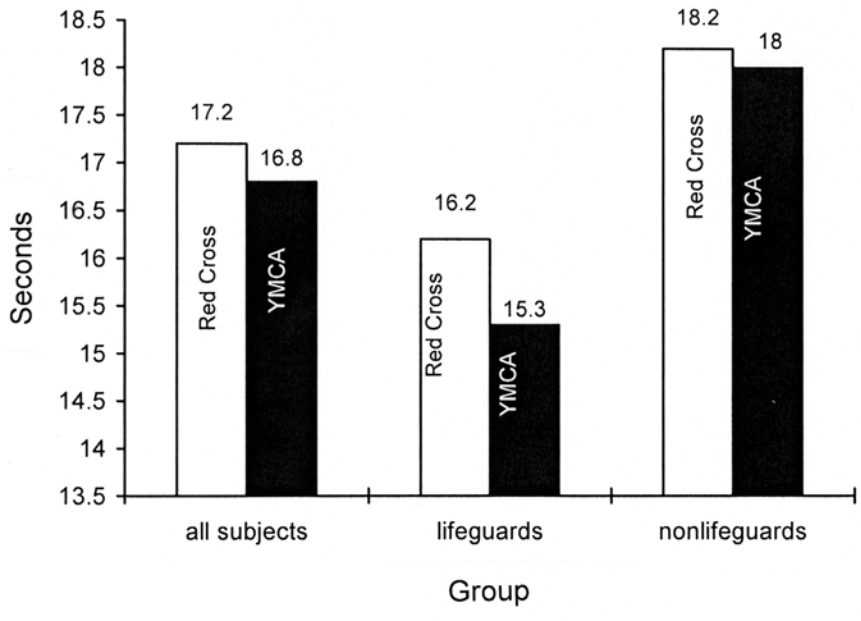

Figure 4 — A comparison of mean times when swimming the front crawl with a rescue tube around two simulated people (sailing buoys) for a distance of 15 yd.

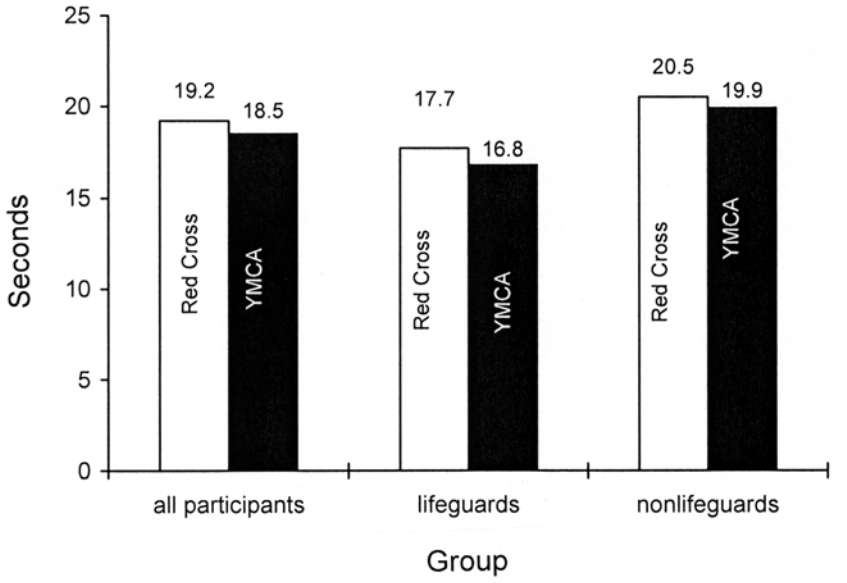

Figure 5 — A comparison of mean times when swimming the breaststroke with a rescue tube around two simulated people (sailing buoys) for a distance of 15 yd.

of swimming the front crawl while holding the rescue tube with one hand (Method B). Trial 3 consisted of swimming the breaststroke with the rescue tube across the chest (Method A). Trial 4 consisted of swimming the breaststroke while holding the rescue tube with one hand (Method B).

Participants began each trial in all three events in the water. They started with their feet against the wall, facing the finish line, holding onto the wall with one hand, and holding the tube with the other hand. At the sound of the beep produced by an Omega horn start system connected to the Zink Hall Pool OSM-5 Omega timing system, participants pushed from the wall and began swimming. Times were recorded and printed automatically when participants touched the Omega touch pad at the end of the 15-yd and 25-yd swim courses in the pool.

Discussion

The victim in this study was a passive one facing away from the rescuer. This positioning was adopted to equalize the approach distance for the YMCA and ARC techniques in order to eliminate the requirement of swimming behind the victim in all ARC approaches in which the victim faces the rescuer.

The results obtained from this study revealed a significant difference ($p < .05$) for all participants when swimming the front crawl and the breaststroke in all but one trial. In four out of five comparisons between the ARC and the YMCA approaches, the YMCA approach method was faster than the ARC method.

Experimental trials in this study were conducted with the victim's back toward the rescuer in each trial. Therefore, it can be assumed that ARC swimming approaches made to victims facing the rescuer would be even slower, because rescuers are required to swim around behind the victim. This additional approach time delays assessment and rescue breathing for the victim even longer.

Observations of participants' ability to maintain control over the rescue tube were also made in this study. The combined group of lifeguards and nonlifeguards performed the front crawl using the ARC method 99 times throughout the testing. During all three events, participants lost control of their tubes 28 times out of 99 trials (28%) when swimming the front crawl. When swimming the front crawl using the ARC approach in a straight line for 25 yd, participants lost control of their tubes 8 times out of 33 trials (24%). During the ARC approach for a distance of 15 yd while crossing over five lane dividers, participants lost control of their tubes 12 times out of 33 trials (36%). When using the ARC method with a front crawl for 15 yd around two buoys (simulated people), participants lost control of their tubes 10 times out of 33 trials (30%). No participant in either group lost control of their tube in any trial while using breaststroke or front crawl with the YMCA technique. More control of the tube was possible with the YMCA method because participants always held the tube with one hand. Loss and recovery of the tube during rescue of a passive victim will cause additional lost time, further endangering the life of the victim because of delayed assessment and rescue breathing.

In addition, results of this study indicated that whether one was a lifeguard did not influence recorded times. There were 15 participants certified as lifeguards. Three were certified by YMCA and 12 were certified by the ARC. All participants performed the same tests using the same approach methods.

It is my recommendation that both agencies, the ARC and the YMCA, should perform experimental studies of this nature before implementing or developing new skills for lifeguards. Both agencies should be working toward the same goals—to identify lifeguard skills that will provide for faster assessment and rescue breathing for near-drowning and drowning victims.

Based on the results of this study, it seems that the ARC has forgotten about the importance of speed in a swimming rescue. These experimental results indicate that swimming with the rescue tube across the chest increases form drag, slowing the rescuer down. Speed is important because time for rescue, assessment, and rescue breathing is very short when considering the survival of a victim. Is a victim rescued by an ARC lifeguard less likely to survive than if rescued by a YMCA lifeguard? The answer to that question based on this study strongly favors the YMCA technique.

I also recommend that the ARC reemphasize and recommit to the importance of speed in a swimming rescue and the importance of physical conditioning for their lifeguard candidates and change their rescue skills and protocols for resuscitation accordingly. The 1995 ARC approach technique is slower than the YMCA (a) because of increased resistance caused by holding the tube close to the chest, (b) because of the possibility of losing control of the tube, and (c) because in most rescues the victim will be facing the rescuer (Pia, 1970), which necessitates swimming around behind the victim. In addition, the ARC advocates extricating a victim from the water before starting assessment and rescue breathing. These three factors waste precious minutes, time that many victims cannot afford. Although the use of rescue equipment such as the rescue tube has increased safety for lifeguards, it should also increase survivability for the victims of near drowning.

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