Psychiatry 2020 : Challenges and Feasibility of Applying Reasoning and Decisionmaking for a Lifeguard Undertaking a Rescue Research

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In areas where lifeguard services operate, less than 6% of all rescued persons need medical attention and require CPR. In contrast, among areas where no lifeguard services are provided almost 30% require CPR. This difference indicates the importance of the lifeguard is. Lifeguard work requires effective problem identification, diagnostic strategies and management decisions to be made in high-risk environments where time is of the essence. The purpose of this investigation was to assess all variables involved in lifeguard work related to a water rescue, and how the information obtained could inform lifeguard training and therefore performance. Methods: By using the drowning timeline, the authors explored all variables involved in a single rescue event by inviting 12 lifeguards to complete a survey of their professional role using a three-round Delphi survey technique. The total potential number of decisions for each phase and sub-phases, the number of variables, the probability of a single event repeating, the duration of each subphase and amount of variables demanded per minute were measured. Each sub-phase was presented as predominantly rational (If less than 1 variable per/min) or intuitive (If more than 1/min). Results: The variables identified in sub-phases were: "preparation to work" (8 variables and 0.0001 variables/min) and "prevent" (22 variables; 0.03 variables/min); these sub-phases were predominately considered to lead to rational decisions. The variables identified during "rescue" (27 variables and 2.7 variables/min) and "first-aid" (7 variables and 1.7 variables) were predominantly considered intuitive processes. Conclusion: This study demonstrates the complexity of a lifeguards' decision-making process during the quick, physically and mentally stressful moments of rescuing someone. The authors propose better decisionmaking processes can be achieved by reducing the time interval between identification of a problem and making a decision. Understanding this complex mechanism may allow more efficient training resulting in faster and more reliable decision-makers with the overall benefit of more lives saved.

Lifeguarding represents a major mitigation of drowning deaths. However, this is a complex, physically and mentally demanding task. Following a period of quiet surveillance an emergency situation arises in which critical decisions must be made and intense physical actions are completed, many of which must be conducted sequentially for a successful outcome. Other physiological, cognitive and experiential factors in a successful rescue include: the lifeguard's level of experience (Page et a., 2011; Barcala-Furelos et al., 2014) mental and physical preparedness; levels of cognitive and physiological arousal (influenced by sleep adequacy for example); levels of energy and hydration and other cognitive and emotional factors including underlying levels of stress, cognitive workload, presence of distractions and the lifeguard's mind-set.

During a rescue, lifeguards are required to identify problems, execute diagnostic strategies and select appropriate management decisions. They must make numerous complex decisions quickly in a high risk environment that engenders physical and mental stress with high potential for failure and negative consequences (Page et al., 2011; Lanagan-Leitzel et al., 2010). The drowning process from immersion to cardiac arrest usually occurs within seconds to a few

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minutes (Szpilman et al., 2014). Early and effective rescue may interrupt this process and prevent serious consequences, including the need for resuscitation and life-long medical complications (Szpilman et al., 2012).

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