



Lay-rescuers in drowning incidents: A scoping review

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ARTICLE INFO

Article history:

Received 24 December 2020

Received in revised form 24 January 2021

Accepted 25 January 2021

Keywords:

Drowning

Rescue technique

Witness

Lay-rescuer profile

Risk

ABSTRACT

Objective: Many victims of drowning fatalities are lay-people attempting to rescue another. This review aims to identify the safest techniques and equipment (improved or purpose made) for an untrained bystander to use when attempting a water rescue.

Method: A sample of 249 papers were included after the bibliographic search, in which 19 were finally selected following PRISMA methodology and 3 peer review proceeding presented at international conferences. A total of 22 documents were added to qualitative synthesis.

Results: Geographical location, economic level, physical fitness, or experience may vary the profile of the lay-rescuers and how to safely perform a water rescue. Four lay-rescuers profiles were identified: 1) Children rescuing children in low- and middle-income countries (LMICs), 2) Adults rescuing adults or children, 3) Lay-people with some experience and rescue training, 4) Lay-people with cultural or professional motivations. Three types of techniques used by those lay-rescuers profiles: a) non-contact techniques for rescues from land: throw and reach, b) non-contact techniques for rescue using a flotation device and, c) contact techniques for rescue into the water: swim and tow with or without fins.

Conclusion: The expert recommendation of the safest technique for a lay-rescuer is to attempt rescue using a pole, rope, or flotation equipment without entering the water.

However, despite the recommendations of non-contact rescues from land, there is a global tendency to attempt contact rescues in the water, despite a lack of evidence on which technique, procedure or equipment contributes to a safer rescue. Training strategies for lay-people should be considered.

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1. Introduction

Drowning is a global killer that claims around 800 people each day around the world, mostly young people in low and middle-income countries (LMICs) [1,2]. These figures are only the tip of the iceberg, as morbidity and many variables related to contributing factors are unknown [3]. A Brazilian study of lifeguarded beaches showed that for every drowning incident (fatal or non-fatal) five rescues were performed (1:5), and that preventative actions represents a 99.8% of lifeguards job [4]. The reality is lifeguards will never be available on all beaches and tend to have a seasonal presence, so bystanders often

play a key role in preventing drowning [5,6]. These “non-expert” rescuer roles carry a risk that can be fatal [6–9].

Despite the widespread expert opinion that an untrained bystander, who witnesses an incident, should not enter the water [7,10–13], the reality is that in most incidents, the lay-rescuer enters the water and contacts the victim without any flotation equipment [9,12–15]. This phenomenon is multifactorial, and has been defined by the concept of the “duty of care” [15], encouraged in many cases by the profile of the victim (child, relative or friend) in which the lay-rescuer can be an adult or child [7,9,13], especially in LMICs [16], the local cultural perspective on rescue [6,13,17], the type of work performed (such as non-specialist fire-fighters or police officer who arrive first) [8] or the relative location and experience of the witness (like surfers or experienced swimmers) [5,17].

The fact is that rescue attempts by laypeople are frequent [5,13,18] and most have no knowledge of rescue techniques [5,9,18–20] except

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for limited groups with a high affinity to aquatic safety (such as surfers) [17]. When attempting a rescue, these people expose themselves to a high level of risk [8,9,13,17,21].

The combination of high risk and lack of ability to manage that risk means that the rescuer is likely to drown while trying to help a victim in distress. This has been described as *Aquatic-Victim-Instead-of-Rescued syndrome* (AVIR) [7] and, has some common characteristics: The victim goes into the water to rescue a child, friend or relative, approximately 50% of them are male, they have no rescue knowledge and do not use any flotation equipment.

In the systematic model of drowning [22] and the drowning chain of survival [12], prevention is the first step. However when the incident is already occurring, the risk analysis may be emotionally driven, and less objective [23]. Obvious and controllable risks are more readily accepted than ambiguous or unknown risks. Aquatic injuries are underestimated and treatments are overvalued [24]. The rescue itself becomes an instinctive and altruistic act [9,15] and a basic ability to swim [14], or social media and TV shows [25], can be enough to motivate a bystander to attempt a rescue.

Water rescues require great physical effort by the rescuer, whether they are professional [26–29] or lay [29]. A concurrent factor to consider in the drowning of the lay-rescuer is that many people lack the physical capability to safely perform water rescue. Traditionally, distances from 25 yards to 100 m are used as an arbitrary measure of aquatic competence. However, it is unlikely that untrained people with the ability to swim 100 m, are therefore able to perform a swimming rescue over the same distance [20]. The difficulty of the rescue and level of fatigue increases in open water with any of the following factors: environmental (currents, flow, waves, wind...), physiological (anthropometric, body mass index...), psychological (victim in stress or distress) and others. It is important to point out that even people with a high knowledge of the aquatic environment and good physical condition are also involved in situations of aquatic distress [30].

A strategy to reduce the risk to the rescuer in the water is to use rescue equipment that reduces exposure time and helps to raise the victims airway out of the water, without getting close enough to be grabbed by the victim [26]. However, there is a lack of literature about the safest equipment to be used by lay-rescuers. Only a few tips based on expert consensus are available to reach the drowning victim, such as reaching with a paddle or branch, or throwing a rope, buoy or any flotation device [11,12,14].

It has also been suggested that parents or caregivers should have approved lifesaving equipment [31]. The use of specific material for rescue requires basic learning and motor skills [10,32]. Something simple like throwing a floating object attached to a rope needs training. Untrained adults with good physical fitness are not able to accurately throw 10 m, whilst with training children can throw up to 12 m more accurately and more quickly [10].

To reduce mortality and morbidity due to drowning, it is necessary to identify the best practices. Safe rescue is an important topic in drowning prevention, so this review aims to identify the profiles of lay-rescuers, and the optimum techniques, procedures, and equipment for a safe rescue by laypeople.

2. Review process. What is the evidence?

2.1. Methodology

The review was performed based on the PRISMA Statement [33]. The literature search was in Medline, PubMed, Embase, Central database of Cochrane for articles. The inclusion criteria were all papers (experimental and observational) in English language published since year 2000. The search algorithm and the PICO (Population, Intervention, Comparisons, Outcome) question addressed are shown in Table 1.

The key-words blocks were; a) block for Rescue: rescue techniques, rescue, reach, throw, don't go, direct body contact, lifeguard, lay-people,

Table 1
Search algorithm and PICO question

Step	Algorithm
1	exp drowning/ or near drowning/
2	drown*.ti,kw. or drown*.ab. /freq = 2 or submersion.tw,kw. or water immersion.tw,kw.
3	emergency responders/ or (emergency respon* or first respon*).tw,kf.
4	(lifeguard* or life guard* or supervis* or watch*).tw,kf.
5	(1 or 2) and (3 or 4)
6	((sign or signs or symptom* or recogni* or notic* or risk*) adj3 (drown* or (struggl* or tire*) adj3 (swim* or "in water"))).tw,kf.
7	(bystand* or by stand* or onlook* or layperson* or lay person* or laypeople or lay people or nonmedical or non medical or untrain*).ti,ab
8	5 and (6 or 7)
Question to be addressed: Laypeople performing safe rescues	
For the layperson, what is the safest aquatic rescue technique or procedure to perform a rescue with minimal risk to the rescuer?	
P	Layperson (Not a lifeguard)
I	The technique or procedure (with appropriate equipment) used to best affect a safe rescue
C	No technique or procedure for a rescue
O	A rescue without endangering himself (out the water and/or expertise with floating equipment)

emergency responders, b) block for Rescue equipment: perry buoy, life buoy, life ring, throw line, shepherd's crook, hook, throw bag, rescue tube, rescue board, body board, reach rescue aid.

A librarian from the Belgian Red Cross Reference Centre performed the search. Another drowning expert (LQ) checked and updated the list.

3. Results

3.1. Summaries of studies

The searches resulted in 243 matches. There was one duplicate. An additional 7 papers were identified by the authors, through other scientific sources. The final matches include were 249.

The titles and abstracts of all records were screened. Original research articles about safe rescue by laypeople were screening. During the abstracts review, 183 articles were considered off-topic. Out of the 66 eligible articles, 47 more were found off-topic during full-text reading. Finally, 19 articles were selected. Three conference papers presented at international conferences with a scientific committee and with research results known to the authors, were added to qualitative synthesis due to relevance to the PICO question.

The selection process is described in the Fig. 1.

3.2. Classification of the evidence

The 22 studies included in the qualitative synthesis were classified by author, year of publication, title, evidence based. The main findings extracted are presented in Table 2.

The mean number of publications per year during the 2009–2020 period was $n = 2$. The year with the highest scientific production on the topic was 2019 ($n = 7$ [32%]). Nineteen (86%) were papers published in peer review journals and 3 (14%) as conference proceedings with peer review. The levels of evidence of the articles were 2a ($n = 1$ [5%]), 2b ($n = 7$ [32%]), 3a ($n = 4$ [18%]), 3b ($n = 5$ [23%]) and 5 ($n = 5$ [23%]). The origin of the articles (excluding those based on expert consensus) were from Australia, New Zealand, Bangladesh, Germany, Turkey, Netherlands, and Spain.

Three types of techniques used by laypeople in 5 observational or experimental studies were identified in the literature: a) non-contact techniques for rescue from land or a vessel: throwing and reaching [10,17], b) non-contact techniques for rescue using a flotation device [5,17] and, c) contact techniques for rescue into the water: swim and tow with or without fins [17,29,37] (Table 3).

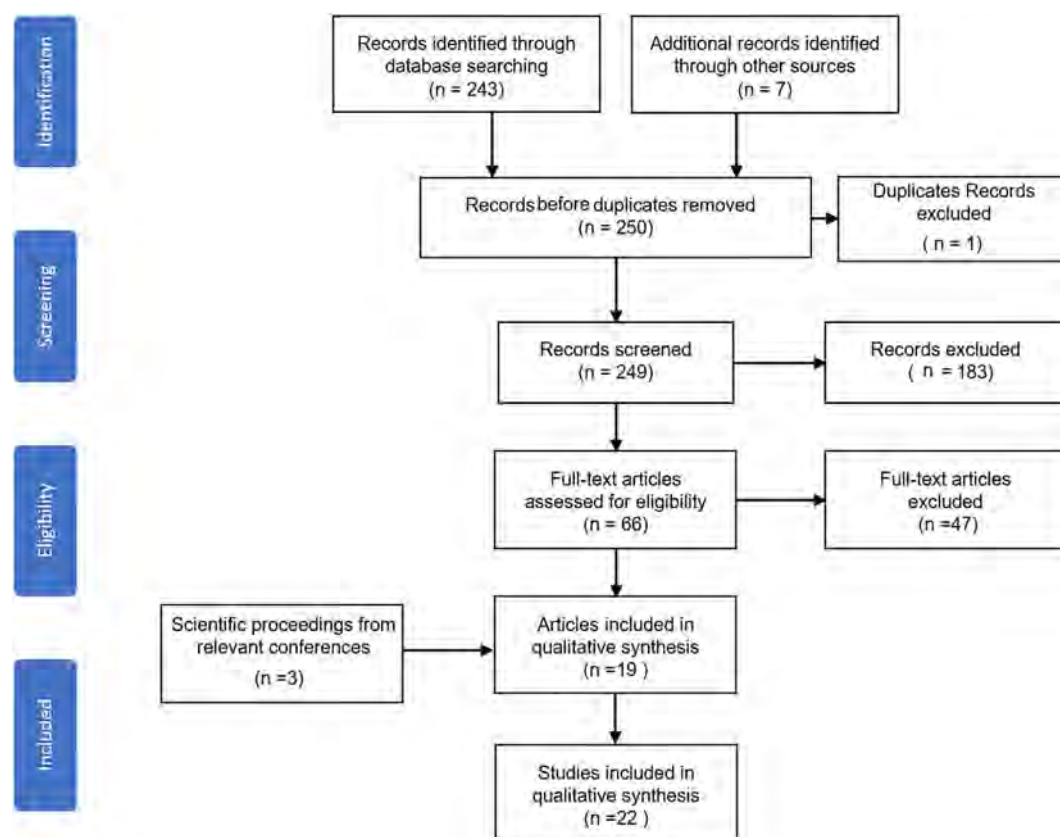


Fig. 1. PRISMA chart of the selection process.

4. Discussion

4.1. The altruistic act of helping a drowning victim. Profile of lay-rescuer

Despite recommendations to minimise risk during the rescue, it seems unlikely that this behaviour can be avoided [15]. Literature shows a human tendency towards altruism when helping drowning victims [15,19,21]. This altruistic behaviour is reinforced when the rescuer has a close bond with the victim [7,9,13,14,21], although in many cases, witnesses take risks impulsively [6,7,17], based on the principles of the Good Samaritan and the desire to do the right thing [10].

In water rescues, the basic ability to swim (regardless of the true level of water skills, age, or experience) can motivate laypeople to attempt the rescue due to emotional factors that override the objective risk analysis [18]. Therefore, the community at risk must be prepared with “tools for heroic acts” [15]. This aligns with one of the six evidence-based interventions to prevent drowning recommended by the WHO, “train bystanders in safe rescues and resuscitations” [34]. However, it is not yet clear how to best apply these guidelines with minimal risk in a real situation when the bystanders choose to enter the water to help a drowning victim. Education can help change actions, such as prioritising a floating aid [17,19], but so far, it has failed to dissuade laypeople from attempting to rescue a drowning person [19].

4.2. The profile of drowned rescuers

There is a lack of information about the motivation of the lay-rescuer and the triggers of drowning, and only a few studies have explored this phenomenon. The profile of a lay-rescuer who becomes a victim may be an adult or a child, rescuing another child or known person. When the incident involves a relative there is commonly a worse outcome for the rescuer. [7,9,13,14,18,21]. The factors that usually contribute to the

fatal outcome occur when the laypeople decide to enter in open water in a complex situation with waves or currents [7,9,13] and do not use flotation equipment [13].

Four lay-rescuers profiles were identified in this review. (Fig. 2)

- 1- Children rescuing children, in LMICs older children are often responsible for the safety of their younger siblings [14,16,21]. [Laypeople without training]
- 2- Adults rescuing adults or children usually family members or friends [7,9,13,18,35]. [Laypeople without training]
- 3- Lay-rescuers with some training in aquatic safety or with particular knowledge of the aquatic environment who are practising an aquatic activity such as surfing or swimming [5,17]. [Laypeople with water rescue training (competence to perform a rescue)]
- 4- People who live in environments with cultural tradition for water safety [6,17], rescue or employees with motivation for rescue (firefighters, police officers) [8] or any role in aquatic security [17]. [Laypeople with or without water rescue training]

4.3. Culture, experience, and education

The profile of the lay-rescuer has some cultural influence. For example, in the Netherlands, due to the geographical characteristics, the population has a general understanding of the risk of flooding. In Australia, the tradition of surfing limits the impact of drowning due to a wider understanding of the risks. In LMICs, drowning mainly affects young children who require supervision (often from older siblings) [14]. Regardless of the motivation, most of the bystanders who attempt rescue do not have water safety training [5,8,18,20]. The experience of some lay-rescuers (such as Australian surfers) can be an important factor in the success of rescues [5,17]. Teaching swimming as part of the national school curriculum increases aquatic skills, and may be a

Table 2
Studies included in the qualitative synthesis

Author(s)	Year	⁽¹⁾ Title	Evidence level*
[13] Lawes JC, Rijkse EJ, Brander RW, Franklin RC, Daw S	2020	Dying to help: Fatal bystander rescues in Australian coastal environments	2b
[17] Brander RW, Warton N, Franklin RC, Shaw WS, Rijkse EJ, Daw S	2019	Characteristics of aquatic rescues undertaken by bystanders in Australia	3a
[32] Beale-Tawfeeq, AK	2019	Triennial Scientific Review: Assisting Drowning Victims: Effective Water Rescue Equipment for Lay-responders.	5
[18] Franklin RC, Peden, AE, Brander RW, & Leggat PA	2019	Who rescues who? Understanding aquatic rescues in Australia using coronial data and a survey. Australian and New Zealand Journal of Public Health, 43(5), 477–483.	3a
[8] Keech JJ, Smith SR, Peden AE, Hagger MS, & Hamilton K	2019	The lived experience of rescuing people who have driven into floodwater: Understanding challenges and identifying areas for providing support. Health Promotion Journal of Australia: Official Journal of Australian Association of Health Promotion Professionals, 30(2), 252–257.	3b
[31] Denny SA., Quan L, Gilchrist J, McCallin T, Sheno R, Yusuf S, et al.	2019	Prevention of Drowning. Pediatrics, 143(5).	5
[20] Petrass LA, & Blitvich JD	2018	A Lack of Aquatic Rescue Competency: A Drowning Risk Factor for Young Adults Involved in Aquatic Emergencies. Journal of Community Health, 43(4), 688–693.	2b
[19] Moran K, Webber J, & Stanley T	2017	The 4Rs of Aquatic Rescue: Educating the public about safety and risks of bystander rescue. International Journal of Injury Control and Safety Promotion, 24(3), 396–405.	3b
[11] Schmidt AC, Sempstrott JR, Hawkins S. C, Arastu AS, Cushing TA, & Auerbach PS	2016	Wilderness Medical Society Practice Guidelines for the Prevention and Treatment of Drowning. Wilderness & Environmental Medicine, 27(2), 236–251.	5
[5] Attard A, Brander RW, & Shaw WS	2015	Rescues conducted by surfers on Australian beaches. Accident; Analysis and Prevention, 82, 70–78.	2b
[14] Mecrow TS, Rahman A, Linnan M, Scarr J, Mashreky SR, Talab A, et al	2015	Children reporting rescuing other children drowning in rural Bangladesh: A descriptive study. Injury Prevention, 21(e1), e51–e55.	3a
[12] Szpilman D, Webber J, Quan L, Bierens J, Morizot-Leite L, Langendorfer SJ, et al	2014	Creating a drowning chain of survival. Resuscitation, 85(9), 1149–1152.	5
[29] Winkler BE, Eff AM., Ehrmann U, Eff S, Koch A, et al.	2013	Effectiveness and safety of in-water resuscitation performed by lifeguards and laypersons: A crossover manikin study. Prehospital Emergency Care: Official Journal of the National Association of EMS Physicians and the National Association of State EMS Directors, 17(3), 409–415.	3b
[9] Turgut A, & Turgut T	2012	A study on rescuer drowning and multiple drowning incidents. Journal of Safety Research, 43(2), 129–132.	2b
[21] Turgut A	2012	A study on multiple drowning syndromes. International Journal of Injury Control and Safety Promotion, 19(1), 63–67.	2b
[15] Pearn JH, & Franklin RC	2012	“The Impulse to Rescue”: Rescue Altruism and the Challenge of Saving the Rescuer. International Journal of Aquatic Research and Education, 6(4).	5
[7] Franklin RC, & Pearn JH	2011	Drowning for love: The aquatic victim-instead-of-rescuer syndrome: drowning fatalities involving those attempting to rescue a child. Journal of Pediatrics and Child Health, 47(4), 434–439.	2b
[6] Venema AM, Groothoff JW, & Bierens JJLM	2010	The role of bystanders during rescue and resuscitation of drowning victims. Resuscitation, 81(4), 434–439.	2b
[10] Pearn J, & Franklin R.	2009	“Flinging the Squaler” Lifeline Rescues for Drowning Prevention. International Journal of Aquatic Research and Education, 3(3).	3b
Author(s)	Year	⁽²⁾ Title	Evidence level*
[16] Talab A, Rahman A, Rahman F, Hossain J, Scarr J & Linnan M	2011	Survival swimming – Effectiveness of SwimSafe in preventing drowning in mid and late childhood. Book of abstracts of World Conference on drowning Prevention 2011 Danang, Vietnam. Publish in Injury Prevention 2015	2a
² [35] Rijkse, E., Daw, S. Brander, R., Lawes J.	2019	Fatal bystander rescues in coastal environments around Australia: learnings and prevention. Book of abstracts of World Conference on drowning Prevention 2019 Durban, South Africa.	3a
² [37] Carballo-Fazanes A, Barcala-Furelos R Costas-Veiga J, Abelairas-Gómez C, Rodríguez-Núñez A, Szpilman D	2019	[Risk analysis of drowning of lay rescuers. A quasi-experimental study of health education] proceeding in Spanish. Book of abstracts of III Congreso Internacional, V Congreso Nacional de Seguridad, Emergencias y Socorrismo: la calidad desde la prevención y la primera intervención. Gran Canaria (España): 2019. p. 339–343.	3b

⁽¹⁾ Coming from peer-reviewed journals.

⁽²⁾ Coming from proceedings from relevant conferences.

* Level of evidence adapted of American Red Cross Scientific Advisory Council [31]:

1a: Experimental and Population base studies. Randomized prospective studies or meta-analyses of multiple higher evidence studies with substantial effects.

1b: Smaller Experimental and Epidemiological studies.

2a: Prospective Observational Analytical – Controlled, non-randomized, cohort studies.

2b: Retrospective/Historical Observational Analytical, non-randomized, cohort or case-control studies.

3a: Large Descriptive studies. Cross-section.




3b: Small Descriptive studies. Cross-section.

4: Animal studies or mechanical model studies.

5: Consensus statements, expert opinion in peer review, guidelines.

Table 3

Categorization of lay-rescuers techniques and evidence identified in the literature.

	1. OUT -THE- WATER	2. IN- WATER	
Type of techniques identified	Non-contact techniques	No-contact techniques using a flotation device	Contact techniques
			
Techniques described in descriptive or experimental studies	Throw –lifeline, rope- [10,17] Reach –branch- [17]	Rescue with surf boards [5,17] Boogie boards, paddle, rescue tube and lifejackets [17]	Rescue tow-in [17,29,37] Rescue tow-in with flippers [17]
Recommendations by consensus of experts studies.	Untrained person – reaching or throwing a float object – [11,12,32] Safely rowing a boat, canoe, or paddleboard [11]	Persons with formal training, experience level and available equipment [11]	No recommendations for lay-people rescues with contact techniques. Recommendations to avoid contact rescues for untrained rescuers [11]

protective factor against drowning [16], but there is no direct research about the ability to retain the rescue skills into adulthood [20].

The teaching of rescue techniques during school should be on-going if the skills are to be retained in adult life [20]. Swimming ability is only one part of water competence [30,31], and rescue techniques must be incorporated into the training programs. It is difficult to prevent the altruistic impulse of lay-rescuers to enter the water [6,12,14,19] but it may be possible to encourage potential rescuers to use some sort of flotation equipment if they attempt a rescue [19].

4.4. Rescue techniques and procedures used by laypeople

Three different techniques were identified.

a) Non-contact techniques for rescue from land: throwing and reaching.

One paper discussed rescues by witnesses by throwing or reaching to victims who are drowning [17]. The study does not offer information about the outcome (success/failure, mortality/morbidity/survival of the

PROFILE OF LAY-RESCUERS

1

Children rescuing children, normally siblings.



2

Adults rescuing family members (especially children) and friends



3

Lay-rescuers experts with experience in aquatic environment (surfers or formal water rescue training)



4

Adults with cultural or professional motivations for rescue



Fig. 2. Profiles of lay-rescuers identified in the literature.

Table 4

Analytical synthesis of the evidence and theoretical /hypothetical risk vs. benefits.

	1. OUT- THE- WATER		2. IN -WATER			
Type of techniques identified	Non-contact techniques		No-contact techniques using a flotation device		Contact techniques	
Ability and experience of lay-rescuer	Untrained LAY-RESCUER	Trained LAY-RESCUER*	Untrained LAY-RESCUER	Trained LAY-RESCUER*	Untrained LAY-RESCUER	Trained LAY-RESCUER*
Benefit vs. Risk	Benefit > Risk	Benefit > Risk	Risk > Benefit	Probably Benefit = Risk	Risk > Benefit	No evidence Expert opinion assume Risk > Benefit
Rescue attempt (force of recommendation)	Strong in favour		Strong in favour	Weak in favour**	Strong in favour	Strong in favour

*Strong swimmer, surfer with water safety knowledge.

**Only when the rescuer is already in water and near the victim.

victim). The recommendation to throw and not enter is generalised, especially for untrained rescuers. However, the need to have suitable rescue equipment (improvised or purpose made) and also to be able to throw it accurately requires training, as Pearn et al. [10] showed in a simulation studio. However, a large group of experts recommend this technique for untrained witnesses as it exposes the rescuer to the least risk [11,12,32].

b) Non-contact techniques for in-water rescue using flotation.

Two descriptive studies collect the characteristics of rescues attempted by witnesses who entered the water with some flotation equipment [5,17]. These lay-rescuers tended to use surfboards or boogie boards since a significant proportion of them were participating in this sport. It is described in the lifesaving science that the use of surfboards reduces water rescue time and decrease the rate of perceived effort when compared to other rescue methods [27,36], so it may increase the chances of success of the rescue. Occasionally lifejackets or rescue tubes were used [17]. Many of these witnesses had some water safety knowledge, and most were strong swimmers or experienced in aquatic environments. Water safety training predisposes the use of materials [19].

c) Contact techniques for in-water rescues: swim and tow with or without fins.

In the study of Brander et al. [17], no flotation equipment was used in 63% of the rescues, so the rescuer was directly in contact with the victim. Most of the victims were unknown (76%). This could be due to many of these lay-rescuers already being in the water at the time of the drowning incident.

Two studies addressed contact rescue without flotation [29,37]. Winkler's research was conducted in the swimming pool and compared the efficiency of the lay-rescuers (trained with good swimming ability)

with the lifeguards during a water rescue. This study also analyses how participants performed In-Water Resuscitation (IWR). As expected, lay-rescuers were slower than lifeguards. They caused more submersions during the IWR attempt, so it is recommended that lay-rescuers should prioritise removing the victim from the water without trying any other first aid or resuscitation procedures [29].

A pilot study conducted in Spain with 51 volunteers (10 lifeguards and 41 lay-rescuers) performed a contact rescue, towing a simulated conscious but helpless victim. Rescuers were classified into three risk groups according to their swimming ability [37]. All 13 participants of the expert group (highest swimming ability - lowest risk) completed the test, while 1 (3%) participant of the medium-risk group and 6 of the low swimming ability - high-risk group (66%), had to be rescued by the study safety team.

4.5. Rescue materials used by lay-rescuers

Our findings are in accordance with a previous systematic review, which analysed the effective water rescue equipment for lay-responders [33]. It is commonly accepted that the safest rescue is carried out from land or from a boat, but the reality is that the majority of fatal rescues occurred in the water and did not use any equipment [13]. An attempt should be made to throw some floating material (branch, rope, buoy, floating boxes) and the lay-rescuer should avoid entering the water [7,9,11,12]. More specific rescue materials such as lifebuoys or lifelines have also been recommended [12,32], but training is required for their use [10]. For any in-water rescue attempt, carrying a flotation device is strongly recommended [9,11,12]. To our knowledge, there is no scientific study that evaluates or compares the use of different rescue equipment by lay-rescuer. The only available evidence is the description of the rescues of Australian surfers, who are representative of rescues on unsupervised beaches and who mostly use their boards to rescue and move the victim to a safe place [5].

4.6. Practical implications for lay-rescuers in a drowning casualty and limitations

After analysing the evidence currently available and based on the different lay-rescuers profiles identified in this review, the authors present a theoretical benefit vs. risk analysis (Table 4), related to where the bystander is located (on-land / in-water) and their level of experience, training and availability of flotation equipment. This analysis is theoretical and hypothetical, so future studies are necessary to validate it.

5. Conclusion

In case of drowning incident, the human motivation to help, especially relatives and friends, exposes the lay-rescuer to a significant level of risk of injury or death. As the first and safest step is to attempt the rescue from land by throwing a floating object, the authors propose that the lay-rescuer should attempt a rescue without entering the water under the expert recommendation “*Reach, Throw, Don't Go*”. People without aquatic experience and aquatic competence should never enter in the water to attempt a rescue.

In many instances, the witness is already in the water (such as surfers, open-water swimmers, rowers, etc.). In such case the witnesses may attempt a water rescue prior to calling for help, but they should have four characteristics to minimise the level of risk: good aquatic competence, good physical fitness, good experience in the relevant aquatic environment, and some flotation equipment.

The strategy to improve water safety should include the promotion of swimming courses, aquatic safety activities and basic rescue techniques using improvised and purpose-made rescue equipment for lay-people as well as water rescue training for people involved in aquatic activities and who may witness an aquatic emergency. These training activities should be repeated on a regular basis.

Conflicts of interest

No author has conflicts of interest.

Acknowledgements

The authors would like to thank the Belgian Red Cross librarians for the initial bibliographic search and Linda Quan for filtering the first bibliographic list and support in this review process. We also want to thank Cristina Varela-Casal for the design of Fig. 2.

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