REVIEW ARTICLE

The Relation of Drowning Rescue Methods with the Rescuer in Cinema

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Abstract:

Objective:

The use of various rescue methods for coping with drowning as a subject of research is scarce.

Method:

With a chi-square statistical analysis in a criterion/convenient sample of film scenes (n=430), it was aimed to reveal how the various rescue methods relate to the rescuer and other related sub-variables. Results confirm that cinematography indeed passes several right and wrong hidden messages to their viewers. It was also found that although the rescue type was not related with the rescuer's age (p=0.836), body composition (p=0.437) and ethnicity (p=0.849), it was related with the type of the rescuer (if any) that attempted to save the drowning victim (p<0.001; *i.e.*, amateur or professional), the rescuer's gender (p=0.027) and clothing (p=0.019) and the victim's early approach (p<0.001).

Result:

To the degree that our findings correspond with reality, film scenes may be used as means of water safety education in lifesaving and lifeguard classes.

Keywords: Cinematography, Drowning, Entertainment education, Hollywood, Lifesaving, Rescue, Water safety.

1. INTRODUCTION

The universal triage for dealing with drowning is "prevention, rescue, treatment" [1] with the second component consisting of various methods. For over a century, humans have tried to save those in distress from drowning using a number of rescue methods. However, most of them were empirical or less sophisticated and only very few of them have been tested scientifically [*e.g.*, 2 - 4]. This was because water safety organizations copied the techniques used by older ones or adapted them slightly due to "differences in their rescue philosophy" [5, 6]. Overall, the selection process of the most appropriate rescue method is based on the sequence of "shout, signal, reach, throw, wade, row, swim with aid, and tow" [7].

While it is statistically difficult (or at least not yet determined) to assess how the suggested rescue methods have contributed to the decreasing of drowning in real life, it is much easier to do so in drowning episodes portrayed in motion pictures. So far cinematography has been linked with the nurturing of the images for nurses, social workers, physicians, law professors [8 - 12] and various attributes of drowning [*e.g.*, 13 - 16]. No study has yet linked cinematography with the various rescue techniques. The question, therefore, that arises is how the various rescue

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methods relate to the rescuer that responds to a drowning episode [17, 18].

Answering this question may be meaningful for two reasons. First, it will help us see how cinematography perceives the drowning rescue methods/techniques and whether these correspond with reality. Second, we will be able to see if we can use film scenes for providing to water safety teachers an alternative, innovative and essential tool in their theoretical classes. Therefore, the aim of the present study was to locate a number of film/television scenes that contain drowning episodes and to assess the application (if any) of various rescue methods in relation to variables related with the rescuer.

2. METHOD

The methodology of this study consisted of four stages. First, with a combination of a criterion and convenience sampling method [19], a search was conducted in film libraries and databases using the terms drown, film, rescue, scenes and cinema as keywords. Initially, nine hundred and four film scenes and TV episodes were identified containing drowning episodes, and from them a smaller number (n=430) was eventually visually observed and analysed, representing the final sample of the study. These films were released during the timeframe 1917-2012 (Table **1**). This total did not include episodes of the world famous TV series "Baywatch" (1989-2001) as we felt that this could form a separate future research study on its own because its content is so directly relevant to the lifeguard profession in precision and the rescue in general.

Table 1. Films that were released during the timeframe 1917-2012 and contain drowning scenes.

1910-1940
1917: Coney Island; The Adventurer; **1921**: Hard Luck; Whistle; **1922**: The Electric House; **1923**: Our Hospitality; The Balloonatic; **1927**: Matinee Ladies; Sunrise: A Song of Two Humans; **1928**: Steamboat Bill, Jr.; **1929**: Innocents of Paris; The Laughing Lady; Wild Waves; **1931**: An American Tragedy; City Lights; Come Clean; Frankenstein; Men on Call; **1932**: Boudu Saved from Drowning; Rasputin and the Empress; **1936**: Modern Times; **1937**: Way Out West; **1938**: Boat Builders; **1939**: Goofy and Wilbur; The Covered Trailer; The Flying Deuces; **1940**: Females is Fickle; Donald's vacations; Pinocchio.
1941-1960
1944: Alice in Wonderland; Waterfront; **1945**: Leave Her to Heaven; **1947**: How to be a sailor; Rescue Dog; **1950**: Popeye the Sailor - Beach Peach; **1951**: A Place in the Sun; Pandora and the Flying Dutchman; **1952**: Million Dollar Mermaid; **1953**: Jeopardy; Titanic; **1954**: A Star is Born; River of no Return; **1956**: The Girl in Black; **1957**: Le notti di Cabiria; **1958**: Vertigo; **1959**: House on Haunted Hill; Kira Frosini; **1960**: Spartacus.
1961-1980
1961: High Steaks; **1962**: Cape Fear; Dr No; The Phantom of the Opera; **1964**: Blood and Black Lace; Sodrasban; The Bait; **1965**: Thunderball; **1967**: Camelot; **1968**: Naked you Die; Reap the Wild Wind; Robby; **1969**: On Her Majesty's Secret Service; Captain Nemo; **1970**: Bloody Mama; Darker Than Amber; Vivan Los Novios!; **1971**: Diamonds Are Forever; **1972**: Journey; Night of the Strangler; The Poseidon Adventure; **1973**: Don't Look Down; The Holy Mountain; **1974**: Chinatown; **1975**: Deep Red; **1975**: Jaws; The Drowning Pool; **1978**: The Legacy; **1979**: SOS Titanic; The Hollywood Strangler Meets the Skid Row Slasher; **1980**: Blue Lagoon; Ordinary People; Superman II.
1981-1990
1981: Ghost Story; Halloween II; The Secret Of Seagull Island; **1982**: Creapshow I; Lady, Stay Dead; **1983**: Double Exposure; La Baraka; Sleepaway Camp; The Outsiders; **1984**: Splash; **1985**: Asterix; The Goonies; **1986**: Fatal Pulse; Murphy's Law; Ponny Puppy-My Little Pony; **1987**: Fatal Attraction; How to be a Swimmer; Too Much of a Gold Thing; White of the Eye; **1988**: A Nightmare on Elm Street IV; Bloody Wednesday; The Big Blue; The Abyss; **1990**: Casey's Gift: For Love of a Child; The Rescuers Down Under.
1991-2000
1991: Beauty and the Beast: The Enchanted Christmas; Hook; Zantalee; **1992**: Last of the Mohicans; The Bodyguard; **1993**: Matlock-The Obsession; The Female Killer; [Tropical Heat TV series unknown episode [14]; **1994**: When a Man Loves a Woman; **1995**: Apollo 13; Pocahontas; Rob Roy; **1996**: The Rock; **1997**: Gatacca; Lolita; Robinson Crusoe; The Game; Titanic; **1998**: Les Miserables; Merlin; Ooberman-Shorley Wall; Saving Private Ryan; Sphere; The Truman Show; Deep Blue Sea; **1999**: Jakob the Liar; Ratcatcher; Set me Free; Stadt In Angst ; The Beverly Hillbillies; **2000**: Cast Away; Deep in the Woods; Drowning Mona; Drowning Mona; Hollow Man; Men of Honour; The Cell; The Little Mermaid II: Return to the Sea; The Man Who Cried; The Perfect Storm; What Lies Beneath; Wilde Mossels.
2001-2005
2001: A Beautiful Mind; Artificial Intelligence; Law & Order: Criminal Intent; The Triangle; Die Another Day; **2002**: Haunted; Ice Age; Minority Report; My Left Eye Sees Ghosts; Pinocchio; The Count of Monte Cristo; The Hours; **2003**: Final Destination II; Open Water; The Italian Job; **2004**: 12 Days of Terror; Dear Friend or The Ghost; Floricienta; Head in the Clouds; Ladies in Lavender; Mean Creek; Mindhunters; Ray; Spiderman II; The Manchurian Candidate; The Mystery of Natalie Wood; The Sea Inside; The Three Musketeers; **2005**: Banyo (The Bathroom); Bound by Lies; Constantine; Dark Water; Fingersmith; Ghost Whisperer-The Gravesitter; Harry Potter and the Goblet of Fire; Pirates of the Caribbean; Revolver; The Fog; The Ring Two; War of the Worlds;
2006-2008

(Table 1) contd.....

2006: Basic Instinct II; Casino Royale; Flags of our Fathers; Flushed Away; Half Light; In a Dark Place; Le Rêve De Diana; Open Water II: Adrift; Perfume; Smallville; The Abandoned; The Grudge II; The Guardian; The Prestige; When we are Big; ABC's Gray's Anatomy; Bad Girl Island Barbie as The Island Princess; Bee Movie; **2007**: Drowning on Dry Land-Grey's Anatomy; Ekko; Hannibal Rising; National Treasure II: Book of Secrets; Pride; Ratatouli; Surf's Up; The Adventures of Ichabod and Mr. Toad; The Hole; The Postman; Whisper; **2008**: Asylum; Australia; Babylon A.D.; Book of Blood; DeUsynlige; Donkey Punch; Farm House; Female Agends; Harper's Island; How to be a Serial Killer; Jumper; Lake Mungo; Let the Right one In; Lo Ti Assolvo; Max Payne; Mirrors; One Missed Call; Picture This; Private Valentine: Blonde & Dangerous; Saw IV; Tansporter III; The Appeared; The Coffin; The Haunting of Molly Hartley; The Secret Life of Bees.

2009-2012
2009: A Single Man; Cabin Fever II: Spring Fever; Case 39; Friday the 13th; Greta; IL Compleanno; Illuminati; Into the Blue II- The Reef; Mr Nobody; Ondin; Pandorum; Sherlok Holmes; Slaughter; Spirit's Revenge Excerpt; Tenderness; The Grinning Man (Jonathan Creek); The Last House on the Left; The Race; The Stepfather; The Twilight Saga New Moon; Thirst (Bakjwi); Welcome; **2010**: Akte Golgatha; Beneath the Blue; Deligianio Parthenagogion; Geet; Harry Potter; Hereafter; King of Mykonos; Love; The Ghost Writer; The Reef; Titans; Winter in Wartime; Nisos (Island); **2011**: Angel or Demon; Biggest Looser; Crash: Drowning in Sin (episode 207); Kommissar Rex; Mission Impossible; Puss in Boots; Sanctum; Season of the Witch; Tangled; The Eagle; The Island II; The Mechanic; The Tree of Life; Unknown; Breathless; God Loves Caviar; Magic City; Skyfall; **2012**: The Departed (The Vampire Diaries); The Grey; The Impossible.

Date not Found
[Black Ribbon]; [Drowning Tribune.wmv]; [erica durance in smalville]; [Klip 159]; [Klip 160]; [kommissar_meer_UWCS]; [Miguel and Ethan try to save Theresa from drowning Part 2] ; [movies with underwater content 22]; [p unknow movie cm20]; [Perfect Disaster]; [Pho}]; [Underwater bubbles]; [untitled film] 2; [untitled film]; [untitled video]; [woman trapped in the sack valve]; [A woman is tied with a rope that is attached on a piano]; Always wear a lifejacket; [Annette Frier]; [batgirl saves batman from drowning]; B[ehind the 8-Ball "Drowning C.O.D."]; Death Boat; [Floaded water tank in a police TV series]; [How to tread water]; [Ikuto saves Suzu from drowning]; [Japanese Hitwoman drowned]; [Jeniffer Garner is tortured with water]; [Lara and amanda trapped underwater]; [Man Saves A Drowning Girl - Shiv Parvati]; [Series "John Doe"]; The Torturer; To the Beach; [Tom and Gerry]; [U Y (Lamu) saved from drowning];

Note. The film titles in brackets were given by the authors because their original title could not be identified. Many of the above films contain more than one drowning episodes. The date of release was not identified in the last category.

Second, we classified and clustered the rescue methods into seven categories. This was done in an effort to produce more manageable and statistically significant results. These categories were namely self-rescue, land-based rescue (*i.e.*, shout, reach and throw), wade-rescue, row and air-rescue (*i.e.*, boat, dinky, rescue board, power boat, jet ski, airplane and helicopter), swim-with-aid rescue (rescue tube, rescue can or other buoyant object), body contact rescue, and no rescue at all.

Third, we identified a number of variables that synthesize the rescuer. These included the rescuer's type (*i.e.*, amateur or professional), age (*i.e.*, adult or child), gender, ethnicity, clothing, early approach and somatotype based on previously published work [17, 18].

Finally, we conducted a statistical analysis. After the data collection and the visual observation of the videos, we conducted a statistical analysis among the rescue methods and the rescuer characteristics. Pearson's chi-squared analysis was used for comparison between categorical variables. Significance tests were two-sided. P-values of 0.05 or less were considered statistically significant. The analysis was performed using STATA v12.1 software.

3. RESULTS

The analysis of the sampled film scenes revealed two non-statistically significant and four statistically significant differences between the various rescue methods with drowning and other rescuer related variables. Precisely, non-statistically significant difference was identified between the rescue type with the rescuer's age (p=0.836), body composition (p=0.437) and ethnicity (p=0.849).

Table **2** shows a statistically significant difference that was identified between the rescue type and the type of the rescuer (if any) that attempted to save the drowning victim (p<0.001). Precisely, amateur rescuers used mostly land-based- (43, 89.58%), wade- (21, 91.30%), and body contact tow (79, 84.95%) rescues. On the other hand, professional rescuers used mostly rescue techniques that involved the use of rescue equipment (14, 56.00%).

Table 2. Rescue Types by the Rescuer Type (n=430).

Rescue Type	Rescuer Type			
	Amateur	Professional	N/A	Total
Self Rescue	0	1	77	78
	0.00	*1.28*	*98.72*	*100.00*
Land-Based	43	4	1	48
	89.58	*8.33*	*2.08*	*100.00*
Wade	21	2	0	23
	91.30	*8.70*	*0.00*	*100.00*

(Table 2) contd.....

Rescue Type	Rescuer Type			
	Amateur	Professional	N/A	Total
Rescue-with-Aid	11	14	0	25
	44.00	*56.00*	*0.00*	*100.00*
Body Contact	79	13	1	93
	84.95	*13.98*	*1.08*	*100.00*
No Rescue	13	1	149	163
	7.98	*0.61*	*91.41*	*100.00*
Total	167	35	228	430
	38.84	*8.14*	*53.02*	*100.00*

Note. Pearson chi-square (10) = 431.8796 Pr = 0.000

Table **3** shows a statistically significant difference that was identified between the rescue type and the rescuer's gender (p=0.027). It was found that all the types of rescues were used mostly by males. Specifically males used land-based (29, 61.70%), wade (20, 86.96%), rescue-with-aid (23, 92%) and body contact tow techniques (73, 79.35%).

Table 3. Rescue Types by the Rescuer's Gender (n=202).

Rescue Type	Rescuer Gender			
	Male	Female	Multiple	Total
Self Rescue	1	0	0	1
	100.00	*0.00*	*0.00*	*100.00*
Land-Based	29	18	0	47
	61.70	*38.30*	*0.00*	*100.00*
Wade	20	3	0	23
	86.96	*13.04*	*0.00*	*100.00*
Rescue-with-Aid	23	2	0	25
	92.00	*8.00*	*0.00*	*100.00*
Body Contact	73	15	4	92
	79.35	*16.30*	*4.35*	*100.00*
No Rescue	13	1	0	14
	92.86	*7.14*	*0.00*	*100.00*
Total	159	39	4	202
	78.71	*19.31*	*1.98*	*100.00*

Note. Pearson chi-square (10) = 20.2859 Pr = 0.027

Table **4** shows a statistically significant difference that was identified between the rescue type and the rescuer's dressing (p=0.019). More precisely, the rescuer most often wore clothes when attempting land-based (39, 86.67%), wade (15, 75%), rescue-with-aid (15, 65.22%) and body contact tow (60, 68.97%) rescue techniques to save a drowning victim. In less frequent film scenes, when the rescuer used specialized rescue equipment they were dressed in a rescue uniform (7, 30.43%).

Table 4. Rescue Types by the Rescuer's Dressing (n=189).

Rescue Type	Rescuer's Dressing				
	Clothes	Swimwear	Rescue	Naked	Total
Self Rescue	1	0	0	0	1
	100.00	*0.00*	*0.00*	*0.00*	*100.00*
Land-Based	39	4	1	1	45
	86.67	*8.89*	*2.22*	*2.22*	*100.00*
Wade	15	4	0	1	20
	75.00	*20.00*	*0.00*	*5.00*	*100.00*
Rescue-with-Aid	15	1	7	0	23
	65.22	*4.35*	*30.43*	*0.00*	*100.00*
Body Contact	60	18	6	3	87
	68.97	*20.69*	*6.90*	*3.45*	*100.00*
No Rescue	8	4	1	0	13
	61.54	*30.77*	*7.69*	*0.00*	*100.00*

(Table 4) contd.....

Rescue Type	Rescuer's Dressing				
	Clothes	**Swimwear**	**Rescue**	**Naked**	**Total**
Total	138	31	15	5	189
	73.02	*16.40*	*7.94*	*2.65*	*100.00*

Note. Pearson chi-square (15) = 28.3466 Pr = 0.019

Table **5** shows a statistically significant difference that was identified between the rescue type and the victim's early approach by the rescuer (p<0.001). Specifically, the victim was approached early when the rescuer attempted a land-based (44, 91.67%), wade (20, 86.96%), rescue-with-aid (20, 80%) and body contact tow (89, 95.70%) rescue technique.

Table 5. Rescue Types by the Victim's Early Approach (n=430).

Rescue Type	Early Approach		
	Yes	**No (Late or None)**	**Total**
Self Rescue	1	77	78
	1.28	*98.72*	*100.00*
Land-Based	44	4	48
	91.67	*8.33*	*100.00*
Wade	20	3	23
	86.96	*13.04*	*100.00*
Rescue-with-Aid	20	5	25
	80.00	*20.00*	*100.00*
Body Contact	89	4	93
	95.70	*4.30*	*100.00*
No Rescue	5	158	163
	3.07	*96.93*	*100.00*
Total	179	251	430
	41.63	*58.37*	*100.00*

Note. Pearson chi-square (5) = 347.9511 Pr = 0.000 Fisher's exact = 0.000

4. DISCUSSION

This study aimed to identify how a sample of motion picture scenes that contained drowning episodes portrayed the application (if any) of various rescue methods in relation to rescuer related variables. From the variables that we assessed, several findings were raised that need discussion.

The rescue type was not related to the rescuer's age, body composition and ethnicity. It seems that scriptwriters have their film stars initiate drowning rescue interventions without a specific pattern that would link the rescue method with the age or the ethnicity of the person that will attempt it. In other words, in cinematography, any type of rescue method can be used by rescuers of various age groups and ethnicities. Given that there is not any previous related published study in motion pictures and science that assesses the contemporary emergency situation in aquatic settings, we cannot contrast or correspond this finding with others. However, it seems surprising that more complicated methods of rescue such as those using flying or boating equipment were not related at least with older rescuers. A possible explanation behind this is that although some such rescue methods should have appeared to take place only by adult rescuers in adult rated films of all genres (*e.g.*, "*Men on Call*" 1931; "*The Girl in Black*" 1956; "*The Man Who Cried*" 2000; "*Open Water*" 2003; "*12 Days of Terror*" 2004; "*Into the Blue II- The Reef*" 2009; "*Ondin*" 2009), at the same time the same "complicated" or "demanding" rescue methods were also used (in low frequency though) by personified cartoon characters that depicted children (*e.g.*, "*Surf's Up*" 2007; "*Ratatouli*" 2007). Therefore, what could possibly be depicted in the adult age group creating a pattern was counterbalanced by what was depicted in cartoons where the script is based more on the imagination of the writer and less on reality and facts.

The rescuer type was related to the type of the undertaken rescue. Precisely, the first important finding was that amateur rescuers used mostly body contact rescue tows (*e.g.*, "*Coney Island*" 1917; "*Boudu Saved from Drowning*" 1932; "*The Rock*" 1996; "*The Goonies*" 1985; "*Gattaca*" 1997; "*Mr Nobody*" 2009; "*Greta*" 2009; "*Deligianio Parthenagogion*" 2010) and less often land based rescues (*e.g.*, "*Our Hospitality*" 1923; "*Females is Fickle*" 1940; "*Ice Age II*" 2002; "*Winter in Wartime*" 2010; "*Come Clean*" 1931; "*Females is Fickle*" 1940; "*High Steaks*" 1961; "*The*

Secret of Seagull Island" 1981; "*Winter in Wartime*" 2010), and wade rescues (*e.g.*, "*The Balloonatic*" 1923; "*Don't Look Down*" 1973; "*The Sea Inside*" 2004; "*A Single Man*" 2009; "*The Eagle*" 2011). It was discouraging that bystanders converted themselves into lifesavers, using the least recommended body contact tow [7]. Thus, it is like that the script delivers the message "if someone needs help, attempt a rescue no matter your ability and availability of equipment". This is a dangerous message especially to children that watch cartoon films (*e.g.*, "*Wild Waves*" 1929; "*Rescue Dog*" 1947; "*Popeye the Sailor - Beach Peach*" 1950; "*Beauty and the Beast: The Enchanted Christmas*" 1991; "*The Three Musketeers*" 2004; "*Ice Age II*" 2002; "*Barbie as the Island Princess*" 2007; "*Puss in Boots*" 2011). Although cinematography may echo reality here, from a water safety perspective, scriptwriters need to make drastic changes in future films whereas the educators should use the current films as an example of bad practice. The second important finding was that the professional rescuers conducted rescues with almost identical frequency in equipment rescues (*e.g.*, "*Men on Call*" 1931; "*Thunderball*" 1965; "*The Guardian*" 2006; "*Surf's Up*" 2007) and body contact rescue tows (*e.g.*, "*Popeye the Sailor - Beach Peach*" 1950; "*The Big Blue*" 1988; "*On Her Majesty's Secret Service*" 1969; "*The Tree of Life*" 2011). The film in which the professionals were depicted to use rescue equipment may be used as examples of good practice in water safety classes and scriptwriters should continue presenting professionals in the same way in their future productions.

The rescue type was related to the rescuer's gender, raising several issues that merit discussion. Specifically, it was found that all the types of rescues were used mostly by males; these included the use of land based rescue (*e.g.*, "*The Big Blue*" 1988; "*Last of the Mohicans*" 1992; "*The Beverly Hillbillies*" 1999; "*Sherlok Holmes*" 2009; "*Cabin Fever II: Spring Fever*" 2009), wade rescue (*e.g.*, "*Ponny Puppy-My Little Pony*" 1986; "*The Postman*" 1997; "*The Cell*" 2000; "*Bad Girl Island*" 2007; "*Geet*" 2010), rescue-with-aid (*e.g.*, "*Steamboat Bill, Jr.*" 1928; "*Pocahontas*" 1995; "*Apollo 13*" 1995; "*The Guardian*" 2006; "*Into the Blue II- the Reef*" 2009) and body contact tow rescue techniques (*e.g.*, "*Boudu Saved from Drowning*" 1932; "*The Bodyguard*" 1992; "*Rescue Dog*" 1947; "*The Three Musketeers*" 2004; "*ABC's Gray's Anatomy-Drowning on Dry Land*" 2007; "*The Tree of Life*" 2011; "*Sanctum*" 2011; "*Puss in Boots*" 2011). A first issue to address is that this happened simply because male rescuers represented about 80% of the sampled film scenes that portrayed drowning rescues, indicating Hollywood's trend to perpetuating the male bravery stereotype in all forms of art (20 - 22]. Secondly, given that several male animation cartoon characters were portrayed to attempt the most demanding/dangerous body contact rescue technique, it seems that cinematography here promotes a dangerous attitude to the youngest film viewers that have not developed yet their judgment and decision-making ability. This may have fatal consequences for the children that will imitate what was shown in the films in moments of leisure [23] or when witnessing a drowning person especially if the children come across with this situation for the first time in their lives [24]. Therefore, Hollywood script writers need to be very cautious about the content of their plot especially when this is for children-rated films.

The rescue type was related with the rescuer's clothing. More precisely, the rescuer most often wore clothes when attempting land-based rescue (*e.g.*, "Modern Times" 1936; "The Flying Deuces" 1939; "High Steaks" 1961; "*Stadt In Angst*" 1999; "*Magic City*" 2012), wade rescue (*e.g.*, "*The Balloonatic*" 1923; "*Don't Look Down*" 1973; "*The Postman*" 1997; "*The Prestige*" 2006; "*The Eagle*" 2011), rescue-with-aid (*e.g.*, "*Steamboat Bill, Jr.*" 1928; "*Journey*" 1972; "*Pocahontas*" 1995) and body contact tow rescue (*e.g.*, "*Whistle*" 1921; "*Robby*" 1968; "*The Rock*" 1996; "*Illuminati*" 2009; "*King of Mykonos*" 2010) to save a drowning victim. While it is logical that clothes would be worn during the land-based/wade rescues, we expected that the rescues requiring swimming would take place wearing swimwear or rescue clothing in an effort to increase the hydrodynamic shape of the body and decrease the drag forces [25] during the victim's approach and the towing back to safety. However, even in real (*i.e.*, non-fictional) circumstances as described by lifesaving textbooks and paintings, lay people often enter the water without taking off their clothes [26] possibly because they lack the necessary lifesaving education or the time to respond. It seems therefore that Hollywood echoes reality. Lifesaving teachers may use these film scenes to underline the importance of taking off clothes when the circumstances allow it (*i.e.*, when the water is not cold, when there is time available to take off the clothes and perform the rescue *etc.*) In less frequent cases, when the rescuer used specialized rescue equipment they were also dressed in a rescue uniform (*e.g.*, "*Men on Call*" 1931; "*Apollo 13*" 1995; "*Surf's Up*" 2007; "*The Guardian*" 2006). This shows that specialized rescue services are more prepared to cope with an aquatic emergency demonstrating professionalism in the way they are dressed and supported by equipment. Therefore we note that here cinematography corresponds with reality too.

The rescue type was related to the victim's early approach by the rescuer. Specifically, the victim was approached early when the rescuer attempted a land based (*e.g.*, "*Our Hospitality*" 1923; "*Modern Times*" 1936; "*River of no*

Return" 1954; "*Last of the Mohicans*" 1992; "*The Beverly Hillbillies*" 1999; "*Surf's Up*" 2007; "*Sherlok Holmes*" 2009; "*Winter in Wartime*" 2010) a wade (*e.g.*, "*The Balloonatic*" 1923; "*The Postman*" 1997; "*Asylum*" 2008; "*The Cell*" 2000), a rescue-with-aid (*e.g.*, "*Steamboat Bill, Jr.*" 1928; "*Pocahontas*" 1995; "*Artificial Intelligence*" 2001; "*12 Days of Terror*" 2004; "*The Guardian*" 2006) and a body contact tow rescue technique (*e.g.*, "*Wild Waves*" 1929; "*The Poseidon Adventure*" 1972; "*Splash*" 1984; "*Beauty and the Beast: The Enchanted Christmas*" 1991; "*When a Man Loves a Woman*" 1994; "*Flags of our Fathers*" 2006; "*Barbie as The Island Princess*" 2007; "*King of Mykonos*" 2010; "*Titans*" 2010). This means that almost every time that a rescuer attempted to save someone, the victim was saved. It was almost only when the victim was approached late or not at all that the victim drowned. This was a very positive message for the film viewers, stressing the importance of amateur and professional rescuers as their presence at the scene may make the difference between life and death. On the opposite side, this high frequency of successful drowning rescues may give the false impression that the safety of those entered into the water depends exclusively on the rescuers, and therefore those that later became victims do not need to be careful while staying in or around the water. Thus, water safety educators that use films in their classes need to underline that, after the rescuer, the victim is the second most essential variable that determines the outcome of drowning [17, 18, 27].

This study was subject to a number of limitations. First, we assessed only about half of the films that were identified to contain drowning episodes. This did not allow us to generalize the findings but only to have a considerable perception of how film scripts portray this aquatic tragedy and its consequent rescue intervention using the various methods that are suggested by the literature and the lifesaving organisations. Secondly, the study did not explore additional interesting variables that could better describe the rescuer process (*i.e.*, the verbal instructions if any that the rescuers used to instruct the victims to stay calm, the complications that were involved in somebody contact rescues when the victim grabbed the rescuer who had to release the lethal grip and complete the rescue attempt on a later stage etc.). Finally, in some cases, a low number of observations due to missing values resulted to run statistical tests using a fraction of the total sample of 430 film scenes (Tables **3**, **4**).

Despite its limitations, this research presented some interesting findings for those involved in the film industry, the water safety field and the general public. First, it showed that the trend of scriptwriters to place actors at risk for the sake of entertainment, suspense and heroism, should change if the films would seek to deliver safety messages that will enhance the public health against the dangers of water. Second, the water safety educators should be cautious when using film scenes; some of them could be used as examples of good and the rest as examples of bad practices. Finally, the general public that watches films should not take into account everything they watch if the film is not part of an entertainment-education policy [28]. Furthermore, parents should be careful with the content of the films that are watched by their children, especially when they are at a young age in which their ability to make judgements between good-bad or correct-wrong is not yet developed. Future studies need now to identify how the rescue equipment relate with the drowning victim, the place and the circumstances of occurrence of a drowning episode [27, 29, 30] in cinematography.

CONCLUSION

In conclusion, this study showed that motion pictures have indeed passed several right and wrong hidden messages to their viewers in how rescuers save a victim and how the use of rescue methods determines the outcome and is related to other drowning-related variables. It was also found that although the rescue type was not related with the rescuer's age, body composition and ethnicity, it was related to the type of the rescuer (if any) that attempted to save the drowning victim (*i.e.*, amateur or professional), the rescuer's gender and clothing, and the victim's early approach. To the degree that our findings correspond with reality, film scenes may be used as means of water safety education in lifesaving and lifeguard classes.

CONSENT FOR PUBLICATION

Not applicable.

CONFLICT OF INTEREST

The authors declare no conflict of interest, financial or otherwise.

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