Ocean & Coastal Management 151 (2018) 134–149

Contents lists available at ScienceDirect

Ocean & Coastal Management

journal homepage: www.elsevier.com/locate/ocecoaman

Are the Biscayne Universitary students ready to go to the beach safely?

Iranzu Sotés [a, *], Imanol Basterretxea-Iribar [a], María de Las Mercedes Maruri [b]

[a] Dpt. of Nautical Sciences and Marine Systems Engineering, University of the Basque Country, UPV/EHU, Portugalete, Bizkaia, Spain
[b] Dpt. of Applied Mathematics, Faculty of Engineering of Bilbao, UPV/EHU, Tecnalia Research & Innovation, Meteorology Unit, Euskalmet, Agency Basque of Meteorology, Spain

ARTICLE INFO

Article history:
Received 10 January 2017
Received in revised form
4 May 2017
Accepted 7 October 2017
Available online 31 October 2017

Keywords:
Aquatic safety
Coastal risks
Rip current
Drowning prevention

ABSTRACT

Beachgoers are not aware of many hazards they may find in the seawater. In 2015 58% of drowning that occurred in Spain took place on the beach. The risk may be reduced by action on the vulnerability and the exposition. Swimming ability may help to decrease vulnerability but it seems not to be enough and, as for exposition, the knowledge of beach hazards is a good aid to reduce bathers' incidents. The aim of this paper is to know which is the knowledge acquired by students who have finished secondary education. Three hundred and sixty four first year students from the University of the Basque Country were surveyed by means of a questionnaire with the purpose of knowing their swimming level, their profile as beach users, their knowledge of rip currents and how to recognize them, and their interpretation of the beach safety information and signals. The research shows that, although more than 95% of respondents go to the beach, the swimming level is low given that 51% can swim between 25 and 100 m. On the other hand, their knowledge of rip currents is also very low. However it is surprising that there are more rescuers than people saved. These results lead us to think that an Aquatic Safety Educational Plan is necessary as soon as possible.

© 2017 Elsevier Ltd. All rights reserved.

1. Introduction

Along to Spanish coast there are more than 9000 beaches representing a touristic attraction as well as a public natural space used by citizens for enjoying and well-being (Holden, 2000; James, 2000). In this way, beach visits from families show the wide range of psychological, social, and physical health benefits (Ashbullby et al., 2013). However, it should be taken into account that these spaces are continually moving by the action mainly of the wind and sea waves on the sediment of the beach (Davies, 1972; Pye, 1982; Martín-Prieto and Rodríguez-Perea, 1998). On the other hand, there are a great variety of risks for the beachgoers that may cause from minor consequences as traumatisms, cuts or bites (e.g., fish spider) up to fatal consequence as drownings. In this respect, the fact that the bather be caught by a rip current is one of the main causes of the drownings (Short and Hogan, 1994).

According to the Spanish National Drowning Report 2015 there were 414 deaths by drowning from which 58% occurred on beaches (RFESS, 2015). From this last percentage only 68% of dead persons were Spanish which confirms the necessity to know the hazards the beach bathers have to face in Spain. 78% of the deceased persons were men which seems to agree with the worldwide tendency (WHO, 2014). Additionally, 7,5% of the people who drowned were between 18 and 25 years of age. In the same way, the results of the Royal National Lifeboat Institutions lifeguard rip current incident data from 2006 to 2011 show that most persons involved in a rip incident were men and teenagers (Woodward et al., 2013). The fact that male teenagers are the most likely demographic group to be involved in a rip incident has also been confirmed by other researches (McCool et al., 2008; Moran, 2006 and Moran, 2008; Woodward et al., 2015).

The World Health Organization (WHO) has proposed some recommendations to prevent drownings such as to teach school-age children basic swimming, water safety and safe rescue skills (WHO, 2014). Of course, swimming ability reduces vulnerability but it is not enough. It should be necessary to swim in open waters and to recognize in situ meteorology conditions and hazards (WHO UNICEF, 2008). In this respect, the training on basic knowledge of the beach dangers reduces the drownings caused by rip currents (Fletemeyer and Leatherman, 2010). Many authors have identified the rip currents as one of the dangers related to the most lifeguards' interventions as well as the main cause of drownings (Scott et al.,

* Corresponding author.
E-mail address: iranzu.sotes@ehu.eus (I. Sotés).

https://doi.org/10.1016/j.ocecoaman.2017.10.012
0964-5691/© 2017 Elsevier Ltd. All rights reserved.

2008; Brander et al., 2011; Caldwell et al., 2013; Brannstrom et al., 2014; Woodward et al., 2015). Therefore, it may be concluded that the rip currents are a real danger for beachgoers (Klein et al., 2003; Hartmann, 2006; Scott et al., 2007; Short, 2007; Gensini and Ashley, 2010; Arun Kumar and Prasad, 2014; Arozarena et al., 2015) as well as for participants in aquatic activities and sports in the surf zone, above all in high and moderate swell conditions (Short, 2007; MacMahan et al., 2011).

Nowadays, flags and any additional information for beachgoers reduces danger exposure in adverse conditions. However, they do not reduce the incidents in sunny days and when waves in the surf zone are not so high (SLSA, 2010).

Rip current position and intensity vary in accordance to the wave energy in the surf zone and to the beach morphology and sedimentation (Wright and Thom, 1977; Short, 1985; Cowell and Thom, 1994; Brander, 1999; Dalrymple et al., 2011). These vary from one hour to another due to waves and tides, and from one week to another due to the morph-dynamism of the beach (Scott et al., 2008).

A rip current is defined as a strong and narrow water flow (Brander et al., 2011; Dalrymple et al., 2011; MacMahan et al., 2011). Its intensity ranges from 0.5 to 2 m/s and its width and distance from the seashore is around 15–60 m and 100 m, respectively (Woodrofe, 2002; MacMahan et al., 2006; Brander et al., 2014; Cervantes et al., 2015). Its direction is sea inside and, therefore, this psychological aspect reduces swimmer's possibility to escape due to panic and fatigue (Short and Hogan, 1994). Due to the fact that waves don't break in this areas, beach users with less knowledge usually find them more attractive. “Don't be fooled by calm, flat sections in the surf, because these are often rips” (Williamson et al., 2008).

According to data collected from swimming pools, non-professional swimmer's velocity is 0.89 m/s compared to 1,29 m/s for a professional swimmer (Costill et al., 1985). Nevertheless, the velocity that a professional swimmer can reach in a pool is not comparable to that reached in a calm sea, which means that these figures are not a precise indicator on swimmers' skill (Tipton et al., 2002; Reilly et al., 2005). For example, the velocity range that a lifeguard can reach in a surf zone is only 0.7–0.9 m/s (Tipton et al., 2008). Moreover, this velocity would be smaller under a swimming simulation nearby rip currents (Aggar, 2014; McCarroll et al., 2015).

Although it is difficult to give a general recommendation on what to do into a rip current, recent research has shown that the best way to escape is to float and to go with the flow sea inside until the intensity disappears, then the swimmer can return to the beach through another area keeping a non-panic attitude (McCarroll et al., 2014a; Drozdzewski et al., 2012, 2015). The psychological aspect, related to the mental block, is one of the factors that makes the rip currents a real risk for both inexperienced and skilled swimmers (Sherker et al., 2008). Other recommendations are to avoid swimming alone, to do it within an area marked by flags and in a safeguarded beach and, if necessary, to cry out for help in case of getting caught in a rip current (Branche and Stewart, 2001; Hartmann, 2006; Wilks et al., 2007).

The Basque Country latitude varies from 42° to 43.5° North and, therefore, is located into the temperate climate area. At noon the solar inclination varies from 25° in winter solstice to 70° in summer solstice which means that the solar illumination is extended from 9 to 16 h, respectively. The western Basque coast belongs to the Biscay Province which has a special regulation on its beaches. There are twenty eight beaches in Biscay which are safeguarded from 11 a.m. to 8 p.m. during summer, exactly from 1st of July to 30th of September. During summer of 2015 more than two and a half million beachgoers went to the Biscayne beaches. August is the month of maximum influx followed by July. According to the data provided by the Biscay Provincial Government (BPG), the day of maximum influx was Sunday 2nd of August with more than 100,000 beachgoers. Concerning beach safety, in 2015 lifeguards had to come to the aid of 621 beachgoers from which 127 persons were saved from rip currents, 42 rescues were as a result of fatigue and the rest due to other reasons (Red Cross Bizkaia, 2015).

The climatic conditions on the coast of the Basque Country are very variable. Therefore, it is not difficult to find a hot and sunny day close to winter. Consequently, people may take this opportunity to go to the beach for swimming even though there are no lifeguard services. Fig. 1 shows the December 7, 2015 photo from a beach in Bizkaia. Beach close to Bilbao where the temperature was near to 20 °C and the waves higher than one meter. As can be seen, the beachgoers are bathing near the rip current on a beach without lifeguard services. The aim of this research is to determine the user profile of the Biscayne beaches concerning the knowledge of the dangers associated with the beach and the way to face them. In particular, this paper deals with the rip currents and aim to define actions to minimize the risks for the beachgoers.

The possibility of bathing inside a rip current is higher if the beachgoer has not been skilled on the basic knowledge of this type of currents (Sherker et al., 2010). Obviously, the education will reduce the vulnerability and exposure (Kennedy et al., 2013). In this respect, some countries or states such as Australia, New Zealand, Great Britain, Ireland or Hawaii have adopted an education plan regarding aquatic safety.

Another risk to be taken into consideration is the multiple drowning incident that happens when the life-savor and the helped bather decease during the rescue. The education of both rescuers and saved persons is considered fundamental to reduce this type of incidents (Franklin and Pearn, 2010; Turgut and Turgut, 2012).

Most people consulted in this research are teenagers living near the coast of the Basque Country with a high probability of exposure to beach dangers. Therefore, a homogeneous sample of first year students from the Biscayne centers of the University of the Basque Country has been selected for the survey. The study aims to analyze their swimming ability, their education on beach safety, and their knowledge and identification of the rip currents and other dangers in the beaches.

2. Methodology

Methodology is based on the analysis of a group of junior citizens with the goal of obtaining qualitative and quantitative steps to improve their resulting profile with regard to education, safety and rip currents. In this way, risk indicators are defined to provide the vulnerability (obtained from their resulting profile) and the exposure (based on their knowledge and identification of hazards). The risk is defined as the IPCC (2012):

$$Risk = f(\text{hazard}, \text{exposure}, \text{vulneravility}) = probability \times damage$$

The information necessary for the research has been collected by means of a survey form which is based on the methodology of Czaja and Blair (1996). Therefore, separate stages have been designed in this process to reach a questionnaire that allowed us to collect the information in a precise and objective way.

Download English Version:

https://daneshyari.com/en/article/8060948

Download Persian Version:

https://daneshyari.com/article/8060948

Daneshyari.com