

Research Article

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Levada walks and canyoning as mountain sport products in nature tourism

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Abstract: Physical activities organised in nature have earned more commitment from tourists who intend to actively visit natural and authentic environments. This paper analyses the profile and the perceptions of active tourists who experienced canyoning and *levada* walking in the mountains of Madeira Island.

The study uses a quantitative methodology analysis, based on an anonymous questionnaire designed for 160 *levada* walker tourists and 130 canyoning tourists. Differences were found between the two groups in terms of their profile and assessment of the two activities. The *levada* walking profile is the one of older, but more active tourists who stay on the island more than 6 days and intend to experience unique and memorable activities related to waterways, mountain trails and cultural landscapes in a sense of freedom and well-being that nature provides. The canyoning profile is the one of younger tourists, more male than female, who are less active, travelling by cruise, and is with an emphasis on the challenges and natural barriers afforded by the steep and unpredictable characteristics of canyons (hedonism). The findings recommend segmentation of the tourists and a strategy for tourism destinations that highlight culture, endemic forest, authentic landscapes and the hospitality of local people in active tourism services.

Keywords: Active Tourism; Physical Activity; Memorable Experience; Natural Environment; Cultural Landscape.

1 Introduction

Physical activity and sports nature have been undergoing increasing social changes and making a positive economic tourism impact. Many sporting events related with nature and the environment, such as trail running, mountain biking, orienteering and triathlon, among others, have worked to attract tourists and emphasise local identities as a strong point. Thereby, the companies and stakeholders, with public policies coupled to a tourist destination (identified as natural and authentic), use physical activity and sport tourism as a key strategy for local development. This is valid not only for major sporting events competition (Chalip, 2005), but also for recreational activities (Cater, Funk, & Low, 2018; Hardiman & Burgin, 2010) and the demands of adventure and hard fitness (Klaus & Maklan, 2011). Likewise, slow and outdoor nature tourism has been growing and becoming differentiated, as has the practice of physical activities in a natural environment (Farkic & Taylor, 2019). The inclusion of sport products and physical activities in the offer of nature tourism packages is evident, which demands concern for preserving wildlife and natural characteristics. Thus, important decisions are made by international organisations in order to preserve and regulate the organisation of tourist activities in nature. We also know that people who intend to practise sport in nature or aim to experience a challenging outdoor activity tend to respect and collect positive connections and feelings from a natural, environmental stimulus. Nature and cultural heritage are increasingly valued as truly significant to tourists' interests by way of physical and sporting activities.

This study analyses two tourist products that include physical activity in a natural environment, particularly in the mountains of Madeira Island. These mountains are diverse and winding, crossed by deep valleys and hundreds of *levadas*, pedestrian trails (paths) and streams canyons. A *levada* is an irrigation channel or aqueduct specific to Madeira Island, which transports water from the north side to the south side for agriculture and other economic purposes. *Levadas* were built in the 16th century using

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traditional and manual processes by rockers and *levadeiros*, professions that are still active today. The *levadas* are accompanied by a flat pedestrian path that allows people/tourists to walk (*levada* walking) for many kilometres, enjoying magnificent natural landscapes in a healthy and green environment. A significant part of the mountains of Madeira, especially in the interior and north of the island, consists of dense vegetation and endemic forest (Laurisilva forest), classified by the United Nations Educational, Scientific and Cultural Organization (UNESCO) as World Natural Heritage. In this context, as the identity of natural and cultural characteristics of a tourist island is an important part of tourism strategy, we want to discuss the evaluation of canyoning and *levada* walking tourists. Therefore, the research was carried out with the following objectives: i) to identify the profile of two tourist groups which participated in physical activities in the mountains of Madeira Island; ii) to analyse if the decision of choosing the island as a tourist destination is connected to physical activity; iii) to compare the perceptions of memorable experiences of the two tourists groups in the mountains of Madeira Island and iv) to understand the perceptions of the two tourist groups about the cultural identity and genuine features of the mountains and the forest of Madeira Island.

2 Literature Review

In many small territories and islands with relatively uncompetitive economies but with unique natural environments, tourism is often seen as a powerful opportunity of development. In these places, the geographical characteristics can be very diverse and specific, which arouses the interest of tourists in visiting them. For this reason, tourism has been developed for niche markets linked to adventure and sport and tends to provide challenging, emotional and unparalleled experiences (Kim, 2010) and a nature brand tourism destination (Hudson & Ritchie, 2009). The organisation of activities in nature are linked to human well-being from a spiritual, health and social point of view (Laing & Frost, 2017), which includes learning about the historical, cultural and spiritual values of society (Baldacchino, 2015; Hinch & Higham, 2005; Vallés-Planells, Galiana, & Van Eetvelde, 2014) and a sociocultural interpretation of the connection established between traditional local sports (e.g., the traditional Canarian fight), culture and tourism (Delgado & Medina, 2019).

For local municipalities, sport events and other sports services create a potential connection between visiting

and visited communities with significant benefits for the local identity (Perić, 2018), pride, residents' self-esteem (Custódio, Azevedo, & Perna, 2018) and sustainable development through sports and social change (Chalip, 2006; Perna, Custódio, & Oliveira, 2019). This vision favours the sustainable development of natural and sociocultural features as the strong points of tourism strategy. In fact, ecotourism is an important niche marketing to sustainable development, using nature, cultural and rural features, that involves a learning experience, a responsible action of tourists and tourism industry (Wood, 2002). As a sub-component of sustainable development, the final objectives of ecotourism are to preserve the nature, minimise the risk and negative impact for the environment, and to provide socioeconomic benefits for local populations and tourists.

Many tourist services, physical activity products and sporting interests are undoubtedly related to natural (Leslie, 2019), historical and traditional heritage (Moyle, Higham, & Hinch, 2018). There is a genuine and unique sociocultural identity that tourists want to know about, while participating in their tourism sports experiences because natural and cultural features are part of human or local community activities (Vespestad & Lindberg, 2011). The experiences of tourism based on nature can be described in the following categories: the genuineness, entertainment, the state of being and sociocultural community. Hence, the development of sustainable rural tourism must match the visitor's desire for authenticity in their vacation experience. Thereby, the sense of the place or the sociocultural reality of the landscape is integrated into the local experience in nature. For example, as the *levadas* and dry-stone walls of *poios* or terraces for agriculture can be considered Madeiran rural monuments, they should be preserved as identity elements of the Madeiran cultural landscape (Almeida, Soares, & Alves, 2013; Machado, & Almeida, 2017; Quintal, 2013). The significance, authenticity and integrity of this natural tourist island offer human and cultural value that has been integrated into physical activity tourism services. Either on the *levadas* or on the most sought-after canyons, various species of flora and fauna can be spotted. The Laurisilva forest, classified by UNESCO as world heritage (UNESCO, 1999), must be highlighted in this regard. It is the largest surviving area of laurel forest on Macaronesian islands and contains a unique suite of plants and animals including many endemic species. Forested areas are perceived by all visitors attracted by nature, health and well-being, and physical exercise in open spaces as a source of interest. Experts estimate that hundreds of visitors walk along the *levadas* every week, particularly the most popular

ones (Rabaçal/Risco/Vinte e Cinco Fontes, Ribeiro Frio/Lameceiros, Cabo Girão/Quinta Grande and Queimadas/Caldeirão Verde) (Quintal, 2013). As Giaccardi and Palen (2008, p. 283) stated, “The understanding and preservation of culture heritage is an essential element of the human condition. We strive to understand the past and to explain and capture our own lived experiences to leave a legacy for the future through the preservation of artefacts, archaeological, historical and cultural sites and, increasingly, through evidence of our relationships with the natural environment”. It means that there is a living relationship between material and immaterial forms of heritage, as well as between natural and cultural heritage. From the point of view of health and well-being, tourist experiences and physical activity resulting from tourists’ contact with nature create positive effects for human health (Brymer, Cuddihy, & Sharma-Brymer, 2010; Frumkin et al., 2017; Wolsko, Lindberg, & Reese, 2019), better functioning of the nervous system and stress release (Chang, 2014) and a positive connection with the spiritual well-being and spiritual coping (Azara et al., 2018; Farkic & Taylor, 2019; Heintzman, 2009). For Arnegger, Woltering and Job (2010), in the natural and cultural active tourism context, there are four basic tourist motivations: nature conservation, nature experience, sport/adventure and hedonism. In this way, sports tourism in nature, recreation and adventure can be an ally in the protection of nature in the protection of nature and local culture: sustainable management of natural resources, public infrastructures and access policies (Fredman, Wall-Reinius, & Grundén, 2012) and the destination image that visitors have towards the natural environment/uniqueness eco-tourism have been assessed positively, which leads to significant tourist satisfaction. In this sense, memorable and positive experiences of tourists in the natural environment can be a very important factor for them to revisit, remember and recommend the place as a tourist destination (Kim, 2010) and reinforce the destination branding in a strategy of preservation of natural features and sensorial feelings (Tukamushaba, Xiao, & Ladkin, 2016). Tourists who have experienced local culture during their travel experiences have high levels of recollection and high-value refreshing experiences as psychological benefits from their travel experiences. In a case study of a tourist island, Lee et al. (2018) found that a tourist experience can be classified into four clusters: multi-experience recreationists, aestheticists, hedonists and knowledge seekers. The four different tourist segments show significantly different behaviour in terms of environmental responsibility. As Weed (2008) argues, what makes a sports tourism experience unique is the combination of three elements:

the local identity where the activity takes place, people’s involvement and the sporting activity. The new concept for active sport tourism is based on the expression “playing with space” (Geffroy, 2017), where sports tourists are considered as reflexive and embodied beings, enjoying sensations, mobilities and places, and constantly (re)making sense of their own practices.

3 Contextualisation and methodology

The study was carried out in 2015 using a quantitative analysis methodology based on responses to an anonymous questionnaire designed for 299 tourists: 160 *levada* tourists and 130 canyoning tourists – 159 women and 131 men (nine of the respondents did not state if they were male or female) – with the following nationalities: German (137), English, (33) Spanish (26), French (15), Swedish (12), Portuguese (8), Dutch (8), Danish (3), Finnish (3), Russian (1) and others (53).

Canyoning is a physical and Sporting activity that involves a combination of hiking, bush walking, abseiling, swimming and rock scrambling by which participants follow the course of streams, over waterfalls and other natural obstacles through deep, narrow, water-filled slots between sheer rock walls – canyons (Hardiman & Burgin, 2010).

Levadas are irrigation channels or aqueducts which are specific to the island of Madeira. The origins of the *levadas*, dating back to the 16th century, are rooted in the need to bring water from the north coast, which is blessed with high levels of precipitation, to the south coast, where the colonisation process started and where most economic activities are located (Quintal, 2010). The inventory data points to 200 different *levadas*, most of them flat, extending for 2150 km and accessible for walking on foot, with different degrees of risk. *Levada* walking is a physical and moderate activity that offers the opportunity to mix landscape consumption and enjoyment of tranquil environments in a natural setting in close contact with the best that can be seen in mountainous areas: water, flora and fauna (Almeida, Soares, & Alves, 2013; Quintal, 2010).

The survey was based on a questionnaire written in Portuguese and translated into three languages (German, French and English) and organised in two parts. The first part included the tourist demographics and profile: gender, age group, academic qualification, professional situation, nationality, the main purpose of travel, mean of transportation, travel partner, travel organisation,

number of days of accommodation and the specific reason for visiting Madeira Island. The second part was based on Kim's model of memorable experiences (Kim, 2010; Kim, Ritchie, & McCormick, 2012), adapted for mountain activities that include water resources (*levada* walking and canyoning): *hedonism*, *novelty*, *refreshment*, *recollection*, *recollection* and *local culture* (Table 1).

To participate in the study, respondents had to meet one of two conditions: being tourists who stayed at least one night in Madeira or tourists who visited Madeira via a cruise for 1 day. The questionnaires for tourists who did a *levada* walking were distributed and collected between September and December 2015, immediately after physical activity was carried out through the collaboration of the nature guide from two local tourism recreation companies. After the end of the activity, the nature guide gave a brief explanation of the study and asked for the voluntary participation of the tourists, who could respond in one of the four languages available. Canyoning questionnaires were distributed and collected between May and October 2015, and the canyoning guide followed the same application procedure. However, the questionnaire was com-

pleted after changing equipment and taking a shower (30 minutes after the end of the activity). The *levada* walks chosen to be part of the study were those that were more than 6 km long (a minimum of 1 hour and 30 minutes of walking), so that the tourists could experience a representation of the typical forest of the Madeiran mountains. The *levada* walks that we used in the study were: *25 Fontes and Risco*, *Alecrim*, *Rei*, *Moinho*, *Caldeirão Verde* and *Ribeiro Frio*. The canyon used for tourist canyoning activity was *Ribeira das Cales*, in the Ecological Park of Funchal, because it was suitable for beginners.

In terms of statistical procedures and data analysis, we applied an exploratory analysis of the dimensions based on the standard test of internal consistency (Cronbach's alpha). The results point to acceptable values in terms of reliability: *refreshment* (0.902), *local culture* (0.882), *recollection* (0.828), *novelty* (0.791) and *hedonism* (0.711). *Knowledge* (0.437) had very low score, so we decided to eliminate this dimension. Moreover, in line with standard procedures, each variable was accessed in terms of normality (via the Kolmogorov-Smirnov statistical test of normality). In order to get a global idea of the

Table 1: Evaluation of memorable experiences (Kim, 2010; Kim et al., 2012)

Dimensions	Items
Refreshment	It was liberating I enjoyed a sense of freedom I enjoyed a feeling of freshness I was revitalised through this tourism experience
Hedonism	It was a very exciting activity It was a challenge I enjoyed the contact/proximity to water in the context of the mountain. The waterfalls were a compelling element of the experience
Recollection	I will remember this activity experience I will repeat <i>Levada</i> walks/canyoning I would recommend <i>Levada</i> walks/canyoning to a friend There were parts of the route that I will never forget
Novelty	It was a once in a lifetime experience It was a unique experience It was quite different from my previous tourism experiences A significant experience while visiting Madeira
Local culture	Local people made a good impression on me I had an intimate experience with the local culture Local people are welcoming and friendly I was concerned about this activity with the history of water courses in the mountains <i>Levada</i> walks/canyoning can be useful for the preservation of nature
Knowledge	I gained knowledge about <i>Levada</i> walks/canyoning I learned new technical skills I felt that <i>Levada</i> walks/canyoning can damage nature

data, we used multivariate statistics (relative frequency distributions, percentages, mean and standard deviation). To analyse the degree of interdependence among qualitative variables, we applied the chi-squared test for independent measures of qualitative data and the exact and Monte Carlo option. We also used the Student's t-test in order to compute the differences between groups (canyoning and *levada* walks), for a continuum scale from 1 point (completely disagree) to 7 points (completely agree), and we employed the Mann–Whitney and t-test for a 5% level of significance. The data were stored and analysed using SPSS, version 25.0.

4 Results

4.1 Profile of tourist groups

In terms of profile, the results point to significant differences between *levada* walking and canyoning practitioners (see Table 2). Regarding their professional back-

Table 2: Profile of tourists involved in *levada* walking and canyoning

ground, most of the respondents in the canyoning group were employees. On the contrary, *levada* walkers were retirees (16.2%), employed (29.0%) or self-employed (9.1%) workers.

With regard to the variable age group, the differences were significant: canyoning tourists were younger than *levada* walking tourists (Table 2).

For 61.6% of the tourists, *levada* walking and canyoning activities were not specific to visiting Madeira Island versus 38.4% of tourists who stated, “Yes, it was a decisive reason to visit”. However, the *levada* walking tourists were more committed to their decision than the canyoning tourists ($p < 0.01$).

Additional information obtained about the profile of the two groups of tourists was as follows: the means of transportation to visit Madeira Island, the travel partner, the travel organisation which provided the service and, finally, the number of days staying on Madeira Island. The results obtained in the two groups of tourists reveal that there are statistically significant differences ($p < 0.001$ and $p < 0.05$; Table 3). The *levada* walking tourists visit Madeira by airplane (74.2%), while the canyoning tourists

		Total		Levada walking		Canyoning		X ²	p Value
		n	%	n	%	n	%		
Gender	Male	131	45.2	61	46.6	70	53.4	6.537	0.011
	Female	159	54.8	99	62.2	60	37.7		
Age (years)	<20	8	2.7	2	0.7	6	2.0	147.44	<0.01
	20–29	67	22.6	7	2.4	60	20.3		
	30–39	55	18.6	4	5.4	17	13.2		
	40–49	35	11.8	23	7.8	12	4.1		
	50–59	66	22.3	56	18.9	10	3.4		
	60–70	42	14.2	41	13.9	1	0.3		
	>70	23	7.8	23	7.8	0	0		
Academic background	1st/2nd/3rd school cycles	37	12.5	20	6.8	17	5.8	22.849	0.002
	Secondary/professional	99	33.0	60	20.0	39	13.0		
	Bachelor's/undergraduates	92	31.0	49	16.0	43	14.0		
	Master's/PhD	56	19.0	35	11.9	21	7.10		
Professional status	Self-employed	43	14.5	27	9.1	16	5.4	24.683	<0.01
	Employed	177	59.0	86	29.0	91	30.00		
	Student	20	6.8	4	1.4	16	5.4		
	Retired	49	16.6	48	16.2	1	0.3		
	Other	6	2.0	3	1.0	3	1.0		
Was canyoning/ <i>levada</i> walking a decisive reason to visit Madeira Island?	Yes	113	38.4	93	31.6	20	6.8	14.961	0.001
	No	181	61.6	74	25.2	107	36.4		

Table 3: Profile of tourists involved in *levada* walking and canyoning according to travel features

		Total		Levada walking		Canyoning		χ^2	<i>p</i> Value
		n	%	n	%	n	%		
Means of transportation	Airplane	222	74.2	168	75.7	54	24.3	116.620	<0.001
	Cruise	64	21.4	0	0.0	64	100.0		
	Sailboat	10	3.3	0	0.0	10	100.0		
	Other	3	1.0	1	33.3	2	66.6		
Travel partner	Alone	29	9.8	19	65.5	10	34.4	12.819	<0.05
	Spouse	132	44.4	78	59.0	54	40.9		
	Boyfriend/girlfriend	33	11.1	16	48.5	17	51.5		
	Friends	36	12.1	13	36.1	23	63.9		
	Family	25	8.4	12	48.0	13	52.0		
	Other	42	14.1	30	71.4	12	28.6		
Travel organisation	Myself/internet	132	44.3	57	43.2	75	56.8	25.450	<0.001
	Travel agency	139	46.6	86	61.9	53	38.1		
	Other	27	9.1	25	92.6	2	7.4		
No. of days on the island?	1 day/cruise	63	21.4	0	0.9	63	100.0	130.085	<0.001
	2–3 days	4	1.3	0	0.0	4	100.0		
	4–6 days	61	20.5	31	50.8	30	49.2		
	More than 6 days	170	57.6	138	81.2	32	18.8		

arrive on the island by cruise ship and sailboat (100%). In the same way, it can be seen that the canyoning tourists stay on the island for a single day, while the *levada* walking tourists tend to stay more than 6 days. This means that the tourists have the opportunity to visit and experience several *levadas*.

Concerning travel partners, both tourist groups did the activity with their spouse (husband or wife); but the friend's partnership had a better score in the canyoning activity compared to *levada* walking (63.9% vs 36.1%). The differences between the two groups were not as high ($p < 0.05$).

4.2 Purpose of visiting Madeira Island and connection with physical and sport tourism

In terms of the purpose of travel, the data suggest that most respondents opted for holiday leisure and recreation (92%) as a key reason to travel to Madeira Island. Around 3% mentioned other reasons. No significant differences were found in terms of travel motives between canyoning and *levada* walk ($p > 0.05$), as can be seen in Table 4.

Table 4: Main purpose of travel

Activity type		Frequency	%
Canyoning	Leisure or vacation	119	91.5
	Work	1	0.8
	Education	6	4.6
	To visit family	2	1.5
	Other	1	0.8
	Total	130	100.0
Levada walks	Leisure or vacation	154	91.1
	Work	3	1.8
	Education	2	1.2
	To visit family	1	0.6
	Other	9	5.3
	Total	169	100.0

However, when we asked the tourists to specify the most important reasons for visiting the island, we obtained positive results associated with nature, moun-

tains, landscapes and physical activity. Table 5 shows the number of choices and the percentage of the survey total.

Participants indicated motives related to nature (24.9%) as the key reason to choose Madeira as a tourism destination, followed by landscapes and mountains (11.9%), physical activity or sport experience (15.7%) and climate (14.4%). Additional results can be seen in Table 5.

The dimension of tourists who mentioned different motives by groups is clearly differentiated with regards to physical activity and climate ($p < 0.001$ and $p < 0.05$, respectively; Table 6). The number of tourists who mentioned active sports and physical activities, in general, was higher in the canyoning group (61.9%), when compared to the *levada* walking group (38.0%). Conversely, the climate factor was mentioned by a larger number of *levada* walking tourists (70.2 %) versus a smaller percentage (31.7%) in the canyoning group.

For the *levada* walking tourists, based on a global analysis, it is important to highlight nature, landscapes and mountains as the specific criteria for choosing the island as a tourism destination.

As physical activity and sports experiences were mentioned by the tourists as the important criteria for choosing the tourism destination, we decided to consider the physical activity of tourists in their daily lives and its connection with tourist activity during the holidays. The results of this descriptive and comparative analysis are shown in Table 7.

Table 5: Specific criteria for visiting Madeira Island

Criteria	No.	%
Nature	180	24.9
Landscapes and mountains	129	17.9
Physical activity or sport experience	113	15.7
Climate	104	14.4
Rest and relaxation	77	10.7
Sun	42	5.8
Sea and beach	23	3.2
Regional products (Madeira wine, flowers, embroidery, etc.)	18	2.5
Health and care	12	1.7
Gastronomy	12	1.7
Cultural identity	7	1.0
Price	6	0.8
Safety	5	0.7
Total	722	100.0

Firstly, most tourists are active in their daily lives (80%), but the *levada* walking tourists (60%) are more active than canyoning tourists (40%) ($p < 0.05$). Also, the next row of Table 6 demonstrates that the active routines of the *levada* walking tourists in their daily lives are associated with the tourism activity (*levada walking*) (95.4% and $p < 0.001$).

Of a total of 295 tourists, 80.3% said that it was the first time that they had experienced the tourist activity. No statistical differences were found between the two groups of tourists.

4.3 Perception of memorable experiences of both groups

Regarding the components of the study, *hedonism*, *refreshment*, *recollection* and *local culture*, the results show a significant difference between the two groups, except for local culture (Table 8).

Both groups evaluated the activity as an experience to remember, to repeat and to recommend to a friend. The *recollection* dimension achieved high scores. This data suggests that most tourists rank the experience of *levada* walking or canyoning as a most memorable and unforgettable one, with a high probability of returning to the destination. Significant differences between canyoning and *levada* fans are discernible because the canyoning group assigns more meaning to the *recollection* dimension compared to the *levada* walking group (6.31 ± 0.772 vs 5.73 ± 0.947 ; $p < 0.001$).

For the other dimensions, *refreshment*, *hedonism* and *novelty*, the same pattern of attitude and behaviour was found, as canyoning fans systematically reported higher values in every area, and major differences emerged ($p < 0.001$).

In order to highlight the features of the forests of Madeira Island as a World Natural Heritage and the cultural environment of *levadas*, we decided to ask the tourists how they evaluated the experience they had. The descriptive and comparative results are shown in Table 9.

The *levada* walking tourists scored higher (60%) in the item “I felt that *levada* walks/canyoning can be useful for the preservation of nature” than the canyoning tourists (39.4%). However, we found no statistical differences between the two groups.

In the overall result, most tourists (64.5%) assessed both activities as very useful for the preservation of nature on the island. This result is reinforced by the fact that tourists of *levada* walking considered that there is an association between the tourist activity with the history

Table 6: The four most chosen criteria for visiting Madeira: comparing two groups of tourist activities

			Total		Levada walking		Canyoning		X^2	<i>p</i> Value
			n	%	n	%	n	%		
Nature	Yes		180	60.0	109	60.5	71	39.4	2.736	$p = 0.120$
	No		118	39.6	60	50.84	58	49.1		
Landscapes and mountains	Yes		129	43.3	81	62.8	48	37.2	3.224	$p = 0.077$
	No		168	56.4	88	52.4	80	47.6		
Physical activity or sport experience	Yes		113	37.9	43	38.0	70	61.9	26.425	$p < 0.001$
	No		184	61.7	126	68.5	58	31.5		
Climate	Yes		104	34.9	73	70.2	33	31.7	8.432	$p < 0.05$
	No		193	64.8	98	50.8	95	49.2		

Table 7: Activity of tourists in daily lives and connection with tourist activity

			Total		Levada walking		Canyoning		X^2	<i>p</i> Value
			n	%	n	%	n	%		
In your daily lives/where you live, is it usual to practise physical exercise or sport (one to three times per week)?	Yes		237	79.5	142	59.9	95	40.0	4.842	$p < 0.05$
	No		61	20.5	27	44.3	34	55.7		
If yes, is this practice connected to the tourist activity (canyoning/levada walking)?	Yes		65	27.7	62	95.4	3	4.6	48.826	$p < 0.001$
	No		170	72.3	77	45.3	93	54.7		
Is this your first experience of levada walking/canyoning?	Yes		237	80.3	133	56.1	104	43.9	0.674	$p = 0.461$
	No		58	19.7	36	62.0	22	37.9		

Table 8: Average and standard deviation of the two activities

	Activity type	No.	Average	Deviation	t-Test	Sig.
Hedonism	Canyoning	130	6.06	0.841	10.492	<0.001
	Levadas	169	4.86	1.075		
Novelty	Canyoning	129	5.67	1.063	4.557	<0.001
	Levadas	169	4.98	1.428		
Refreshment	Canyoning	130	5.68	0.910	7.831	<0.001
	Levadas	169	4.51	1.495		
Local culture	Canyoning	125	5.20	1.059	-1.102	0.271
	Levadas	164	5.32	0.871		
Recollection	Canyoning	130	6.31	0.772	5.657	<0.001
	Levadas	169	5.73	0.947		

and origin of water courses in the mountains (60.9%). Conversely, the canyoning tourists did not have the same opinion: 66.2% disagreed ($p < 0.001$). These differences were also identified in the result “I had close experience of the local culture”, but they were not so significant (57.4 disagreed; $p < 0.05$).

In general, the results of both groups considered that people from the local community are hospitable and friendly. A large majority of tourists (90%) were greatly impressed with the hospitality of the local people.

Table 9: The World Natural Heritage and the cultural environment of *levadas*: comparing two groups of tourist activities

		Total		Levada walking		Canyoning		X ²	p Value
		n	%	n	%	n	%		
I felt that <i>levada</i> walks/canyoning can be useful for the preservation of nature	Agree	193	64.5	117	60.6	76	39.4	4.031	p = 0.135
	Neutral	36	12.0	19	52.8	17	47.2		
	Disagree	70	23.4	33	47.1	37	52.9		
Concern was taken to associate the activity with the history and origin of water courses in the mountains	Agree	182	60.9	114	62.6	68	37.4	17.389	p < 0.001
	Neutral	52	17.4	33	63.5	19	36.5		
	Disagree	65	21.7	22	33.8	43	66.2		
Local people made a good impression on me	Agree	269	91.2	148	55.0	121	45.0	4.102	p = 0.116
	Neutral	14	4.7	9	64.3	5	1.7		
	Disagree	12	4.1	10	83.3	2	16.6		
I had close experience of the local culture	Agree	159	55.0	93	58.5	66	41.5	7.172	p < 0.05
	Neutral	69	23.9	45	65.2	24	34.8		
	Disagree	61	21.1	26	42.6	35	57.4		
Local people are welcoming and friendly	Agree	264	89.5	143	54.2	121	45.8	6.147	p < 0.05
	Neutral	21	7.1	16	76.2	5	23.8		
	Disagree	10	3.4	8	80.0	2	20.0		

5 Discussion

The activities of canyoning and *levada* walks, although based on a similar geographical setting (namely water courses flowing from the mountain peaks of Madeira Island), are clearly differentiated in terms of their intrinsic value as tourism products and physical activity demands. The sociodemographic characteristics, for example, professional status and reasons to experience the activity, were found to be different between the two groups. It is evident that canyoning fans seem more thrilled (*hedonism*) and delighted by their experience as compared to the *levada* tourists. A possible explanation relates to the exhilaration and challenge of canyoning as a sporting activity, that is, canyoning offered an exciting and unique activity as well as a physical challenge for several visitors. Age is another variable that can explain the differences between the two groups: the *levada* walkers were older than the canyoning tourists. Therefore, the differences in the profile of canyoning and of *levada* walking tourists were significant. Canyoning was highlighted as a unique experience, to be repeated and remembered. This is unique in natural canyons using a combination of

bush walking, abseiling, swimming, and rock scrambling (Hardiman & Burgin, 2010). Very positive points included the multisensory relationship with the water sounds and the sensations of freedom, freshness and revitalisation.

The *levada* walking tourists are more linked to and concerned with nature and the environment, mountains and landscapes than the canyoning tourists. Nevertheless, our results seem to indicate that canyoning is a memorable experience and is quite interesting/valuable from the active tourists' point of view.

Regarding *levada* walking, tourists highlighted the natural landscapes as being challenging but pleasant, with thick vegetation exuding feelings of pleasure and relaxation in natural surroundings. The natural landscapes are inseparable from the sociocultural and historical heritage of Madeira, and *levadas* are harmoniously integrated into nature, which arouses interest from visitors in understanding their origin and functions. This is a very important difference between the two groups. In addition to being a physical activity, *levada* walking is a multisensory experience resulting from a direct interaction not only with the fauna and flora, but also with the cultural landscape of *levadas* and *poios* (terraces), with

their dry-stone walls, and also *palheiros* (stables) punctuating the local communities. In this way, the results seem to suit tourists with moderate levels of ability for activity, reduced risk and a fondness of landscapes and nature, as well as a desire for healthy physical activity and well-being, together with an understanding of local culture and society.

Another interesting finding of this study is that many from both groups of tourists are active in their daily lives, but the *levada* walking tourists are more active than the canyoning tourists. As *levada* walking tourists recognise that their (active and healthy) daily lives are associated with the tourism activity, it is strategic for the tourism destination to highlight the features of physical activity in the mountains (flat and moderate) and the positive effects on fitness and well-being. These findings are in accordance with other studies that confirmed that tourists' experiences and physical activity resulting from contact with nature create positive effects on human health (Brymer, Cuddihy, & Sharma-Brymer, 2010; Chang, 2014) and a positive connection with spiritual well-being and spiritual coping (Heintzman, 2009). Nevertheless, there are reasons to suggest that nature, climate, mountains and natural landscapes are the key attributes of the destination to attract tourists to pursue active holidays and to be in close contact with nature (Farkic & Taylor, 2019; Higham & Hinch, 2018). The findings reveal that *levada* walking tourists visit Madeira by airplane and stay in Madeira more than 6 days, while the canyoning tourists visit by cruise ship or sailboat and stay for 1 day on Madeira Island. This difference is especially important because the active tourists have the option to experience different and specific *levadas*. In the Laurisilva forest (especially in the north of the island), the active tourists can visit dozens of *levadas*, all different with characteristics of endemic flora and fauna, including unique and stunning landscapes. The length of the *levada* (from 2 to 22 km), the degree of physical difficulty, the changing weather, the unique cultural characteristics and the natural landscapes are the decisive elements to consider when planning the tourist service.

Interestingly, although canyoning tourists are less active in their daily routines than *levada* tourists, they consider having a sporting/physical experience to be an important criterion in choosing the tourist destination. This means that it is necessary to distinguish and highlight the features of the two types of tourism activities and services. *Levada* tourists are more linked to a physical and spiritual well-being experience (Azara et al., 2018; Smith & Diekmann, 2017) and slow adventure in nature tourism (Farkic & Taylor 2019), provided by the unique

characteristics of mountain forest, while the canyoning tourists are more connected to a challenging experience that involves risk and self-confidence. The main findings of this study highlight the advantage of adding a physical activity module to the current touristic product along with an efficient and adequate service management to match active tourists' expectations. For this reason, local operators aiming to increase the number of products available in this market niche must have access to in-depth knowledge of active visitors' needs and expectations in order to devise appropriate measures in terms of quality, motivations and operational feasibility (Szczechowicz, 2012). In addition, the activities in this natural environment are usually undertaken in small groups, and although safer and less risky, they require the presence of an expert, skilled guide to interpret, mediate and navigate people through unfamiliar wild spaces, negotiate harsh environments and make such experiences more accessible even for less-skilled participants (Farkic & Taypor, 2019; Varley, Farkic, & Carnicelli, 2018). Such experiences facilitate the generation of social capital and memorable experiences and contribute to positive energy and happiness.

With regards to the local cultural aspects, both groups presented similar results indicating that the tourist products should include and reinforce the features of local culture. Both these physical activities can be useful for the preservation of nature as an integrated strategy. Another possibility may be to create a *natural and cultural heritage park*, a project that would be managed by the territory, with an adequate integration of sporting and cultural activities for a sustainable development of the region (Perna, Custódio, & Oliveira, 2019). It should be an intercommunity tourist product involving all the localities of the Madeira and Porto Santo islands. One of the most innovative aspects is the holistic inclusive vision of the heritage concept, which involves the material, natural and historical values, as well as the immaterial cultural values of societies. This could include oral traditions, aspects of daily life, ancient labour activities and collective memory.

As local people are recognised by the participants in this study as friendly and welcoming, the hospitality of the workers and local community is a key factor for an active, sport tourism destination. This can offer a complete tourist product, enriching the experience of the visitor such that they recommend and revisit the destination, with a natural and cultural tour of the landscapes of this tourism destination. Their historic and ethnographic products reinforce and preserve the identity of regional heritage with lower environmental impact. It could also allow the recovery of *levadas* and rural dry-stone walls of *poios* (terraces), all over Madeira, even on the regional

roads and canyons, contributing to the maintenance of the distinctiveness of the Madeiran landscapes and their integrity. Authenticity and genuineness should be two features and values from a local identity in the offer of a sport tourism destination. Sport has unique advantages over other types of cultural tourist attractions when considered in the context of commodification and authenticity (Bouchet, Lebrun, & Auvergne, 2004; Hinch & Higham, 2005; UNESCO, 2016). Madeira has sites and landscapes of international geological significance that should be managed with a holistic concept of protection, education and sustainable development (Higham & Hinch, 2018; Sahebalzamani & Bertella, 2018), because natural and cultural heritage stimulate sport tourism as well as geo-tourism, ecotourism, wine tourism, gastronomic tourism and ethno-tourism. It is important that economic growth and tourist island development do not cause irremediable conflicts within communities. It is necessary to find a resilient model that integrates market demand and, on the other hand, respect for the issues of the environment, social cohesion and the quality of life of residents. Improving tourism services in the sense of valuing the genuine and endemic aspects of nature should be part of a good governance strategy in the tourist destination (Alberts & Baldacchino, 2017; Chalip, 2005).

The meaning and value of *levadas*, *poios* (terraces), canyons, waterfalls and traditional houses of stone come mainly from the material identity dimensions of the Madeiran cultural landscape to be preserved. The notion of ecotourism, as well as that of ethno-tourism, involving an understanding of the history and culture or original ethnography of a region or of rural societies living in harmony with nature, can help to preserve the environment (Arntzen, 2002; Wood, 2002). In the same way, tourism sports activities in nature can affirm the authenticity of the cultural landscapes associated with local communities, contributing to sustainable rural tourism and improved quality of life of the people (Mackenzie & Brymer, 2018; Martins & Costa, 2009).

With regards to the visitors' assessment of their experiences, it is important to note that most tourists declared that their current experience was memorable and amazing, which leads to high levels of interest in returning to the destination and likelihood that they will recommend it to family members and friends. Therefore, the tourists' experience must be considered when it comes to the benefit of the participant's long-term interest, loyalty, customers' confidence and future recommendation (Klaus & Maklan, 2011). The quality of the service experience in a positive environment (Tukamushaba, Xiao, & Ladkin, 2016) is also very important for a pleasant memory of the place.

Both activities are deemed useful for the preservation of nature since they safeguard the natural characteristics and the cultural context in which they are performed. This is also true for other activities that are part of the diversity of tourism marketing segment of active tourism and sports in nature, for example, mountain biking and trail running in the mountains. So, the question is how to grow and improve the services of active and sports tourism linked to mountains and cultural traditions and, at the same time, cause positive impacts on nature? We know that there has been an evident conflict between the needs, that is, preservation of trails and wildlife in many places, and an overuse of mountain biking, canyoning, running or walking in the mountains. Safeguarding these natural spaces does not mean prohibiting the activity, but to make it *sustainable* and viable. A new regulation, taxing and usage fee for these activities, touristic or sporting competition is necessary in order to preserve and save the natural genuineness of the trail, canyons and *levadas*. In a strategy for an active and sport tourism destination, with the development of mountain activities as tourist products, it is necessary to create rules and guidelines that allow for better organisation, without going beyond the limits that jeopardise the preservation of the territory. Accordingly, the legislation needs to be changed and it is important to create geo-referenced trails and canyons, or go even further and create a charter of nature sports.

From the point of view of attracting tourists to the island of Madeira, it can be highlighted that there is a market for mountain activities for tourists who are interested in travelling for the purpose of participating in canyoning and *levada* walking and having unique and memorable experiences in the mountains of Madeira with their natural and cultural landscapes.

6 Conclusions

This study aimed to identify two active tourism products associated with mountains and nature. Canyoning and *levada* walking are two distinct tourism products targeted at different groups of active/sports tourists. These tourists look to experience unique and memorable activities related to waterways, mountain trails and natural and cultural landscapes, with a freshness and sense of freedom that nature provides. The profile of *levada* walking tourists is: older, more female than male, retiree, more active, staying on the island more than 6 days, travelling by plane with travel agency support and the travel partner is the husband/wife. The profile of canyoning tourists is:

younger, more male than female, less active, travelling by cruise ship or sailboat, the travel partner is the husband/wife or friends and they do not use a travel agency to travel, but they do themselves via the internet.

We can conclude that *levada* walking tourists consider having an experience of *levada* walking in the mountains as decisive in their decision to visit the island. For these tourists, it is important to highlight nature, landscapes and mountains as the specific criteria for choosing the island as a tourism destination. So, if we consider that there are a few thousand tourists (per month) who have that mountain experience, we can conclude that we have a specific, tourist nature product. On the other hand, for canyoning tourists, having this experience was not decisive in their choice to visit Madeira.

Another conclusion that reinforces the marketing segmentation of the profile of the *levada* walking tourists is their lifestyle and daily routines. This group is more active than canyoning tourists and their active routines in their daily lives are associated with the tourism activity. These explain the origin of the *levada* walking tourists, who are people from the north of Europe having a positive link with regular exercise and healthy, natural and environmental behaviour. Both activities require different levels of physical demand, which call for the segmentation of tourists. But, if we analyse the physical characteristics of particular canyons and *levadas*, we will probably find different degrees of physical demand not only between the two activities, but also within a single activity. Thus, while a 3-km *levada* can be done by active tourists over 70 years old, others are more extensive and complex and present a higher degree of difficulty. Thus, it is pertinent to have studies that classify *levada* and canyoning tourists, and other trails, according to the degree of physical demand. On the other hand, it is necessary to be careful in the offer and planning of the active nature tourism service, in the sense of knowing whether or not tourists are physically able to perform an activity in a canyon or in a specific *levada*.

In a global analysis, the five most important criteria for the decision to visit Madeira Island in order of importance were: nature, landscapes and mountains, physical activity or sport experience, and climate. We can conclude that Madeira is a nature and mountain tourism destination and is not meant only for walking and canyoning. There are other sporting tourist activities in the mountains for other tourist targets, such as endurance mountain biking, trailing and hiking. More investigation is necessary for the segmentation process of the profiles of sport and active tourists connected to the mountains and landscapes.

Regarding the perception of memorable experiences, both groups evaluate their tourist activity in the mountains as memorable and unforgettable: “I will repeat, recommend and remember it and there are parts of the route that I will never forget”. However, the recollection of this experience is more important for *levada* walking tourists than canyoning tourists.

Canyoning tourists highlighted the challenges and natural barriers of the steep and unpredictable characteristics of canyons (*hedonism*); the courage and physical requirement of mobility and strength; the application of basic abseiling techniques; the refreshing, memorable experience; the diversity of skills that makes the activity fascinating; and lastly, the controlled risk.

It can be concluded that participants in both groups had a very positive assessment of their tourist experience and that tourist activities can be useful for preservation of nature on this tourism island. This can be explained by the fact that *levada* walking tourists consider that there is an association between the tourist activity and the history and origin of water courses in the mountains. Conversely, the findings show that canyoning tourists do not have the same evaluation. In conclusion, *levada* walkers emphasised the uniqueness of the Madeiran landscapes, their interest in the origin and functions of the Madeira *levadas* from a historical and cultural heritage perspective, the integration of man with nature as it pertains to the development of his well-being, the contemplative and relaxing surroundings and the knowledge of biodiversity and of the *Laurisilva* forest.

A limitation of this study is that we evaluated the tourists experience only on one canyon, the “*Ribeira das Cales* canyon”, while for *Levada* walking tourists, we used six *levadas*. So, it is necessary to perform the study in other canyons, especially in the north side of the island that is greener in nature and shows forest diversity.

The specificity and genuineness of Madeiran nature and culture make sporting activity a unique experience between human and natural challenges. Having said this, the natural, historical and traditional or sociocultural heritage, all distinct qualities of Madeira Island, must be preserved as a whole, genuine and unique, differentiating this destination and environment from other places as a premium location for touristic sport activities.

Additionally, this study concludes that people from the local community are hospitable and friendly and the tourists have a positive image and great impression of the workers and local people.

As the success of a tourist service that links nature with history, physical activity and cultures depends on the quality of service that requires the presence of an

expert, a skilled guide, to mediate and help tourists navigate in wild spaces, it is important to improve the profile and skills of nature guides. The satisfaction and positive impacts on the health of tourists and a memorable experience in nature sport are achievable if we provide a guide with an appropriate profile, qualities and skills. This is an assumption we should study in the future.

The findings recommend that local authorities, companies and stakeholders connected to the mountain sport activities and the tourism destination must preserve the natural tourist spots. There should be regular observation and management of human presence to maintain the integrity and availability of nature, as expected by visitors, as well as the historical and cultural values of the local societies. As tourist sport activities in the mountains have been markedly increasing, it is important to respect the wildlife and the genuineness of the natural forest and world heritage. In this sense, natural positive impacts of tourist activities should be made compulsory. The findings of this study indicate that tourists are sensitive and receptive to this contribution. More studies are needed in order to segment and specify the profile of mountain tourists and the features and potentialities of mountains and waterfalls as a natural, ecological, cultural and tourist product.

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