



What role geoparks play improving the health and well-being of senior tourists?

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ABSTRACT

In recent years geoparks, helped by governmental policies, have become tourist destinations especially among senior visitors. The paper aimed to analyse whether geoparks contribute to improving the health of tourists older than 65 years and what were their main motives to visit geoparks. The data were collected from 398 senior tourists who visited the Villuerca- Ibores-Jara Geopark (Spain) in 2023, presenting our results using SmartPLS version 4. The results showed that senior tourists are very interested in visiting this geopark for psychotherapeutic reasons, given its high environmental and geological interest. In addition, they consider geoparks as spaces where they can socialise, which is beneficial considering the isolation that many often experience during the year. These findings are highly relevant for public authorities to protect, maintain and promote geoparks among senior tourists.

1. Introduction

Public interest in senior tourism has been growing recently. Senior tourism is being one of the fastest growing sectors of the tourism industry prior to the COVID-19 pandemic [1], and one likely to continue increasing with older adults making up al-most a third of the world's population by 2050 [2]. In Spain the population over 65 years of age stands out for representing 21,65 % of the total population and for continuing to increase both in number and in proportion [3].

Senior tourism has been extensively studied with regard to its economic and social impacts on destinations [4], its contribution to the promotion of destinations [5] and its relationship with the development of educational policies aimed at improving the well-being of seniors [6,7].

The appeal of senior tourism has been commonly analysed from the perspective of the well-known push and pull theory as a tool to study tourism behaviour and consumption [8]. Pull factors have tended to be of greater scholarly interest, these being a destination's tourism attributes deriving from its e.g. natural, cultural, historical or urban attractions [9,10], architectonic and from the religious, spiritual and intangible cultural heritage [11,12]. By contrast, push factors – pertaining to tourists' motivations – have received less attention in new destinations such as natural parks and geoparks, despite some recent research efforts [13,14].

There are hardly any studies on senior tourism in geoparks as new protected natural areas of geological content [15]. However,

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visitor numbers to geoparks have started to increase since the last two decades [16,17], including among senior tourists [18,19], largely due to state policies regarding social tourism. Such policies focus on the price advantages of travel subsidised by public authorities, aimed at allowing disadvantaged citizens to exercise their right to rest and travel [20].

Geoparks are not only designed for those who have geological knowledge, but also for anyone seeking to enjoy nature [21] and improve their health through their direct contact with outdoors [22]. According to Fung and Jim [23], landscapes and geological features attract both local and foreign tourists who are motivated not only to learn about geoparks' natural and geological heritage, but also to improve their health (pull factors) [24].

Geopark Villuercas, Ibores, Jara is a geographical marvel that captures the essence of Earth's geological history and natural beauty. Its diverse landscapes, rich biodiversity, cultural heritage, educational opportunities, and recreational activities make it a destination of enduring interest and significance. As visitors and researchers explore this captivating region, they not only gain insight into the Earth's geological past but also contribute to the conservation and appreciation of this unique geological heritage. Geopark Villuercas, Ibores, Jara stands as a testament to the enduring allure of geoparks and their ability to connect people with the wonders of the natural world.

Taking into account the two main factors behind senior tourism – health and well-being [25,26]– the aims of the present study, conveyed as questions, are twofold. First, does geopark tourism help improve the health of senior tourists? Second, if it does, what are tourists' main motivations for visiting these new protected natural areas? Through highlighting the enormous appeal of geoparks (nature, landscapes and geological features), this research aims to provide information to tourism authorities on the kinds of activities offered by geoparks which can stimulate senior tourism and thereby improve older visitors' health and well-being.

The paper is organised into six sections. Following this introduction, the second section provides a review of the literature concerning the role played by social tourism in improving senior tourists' health and well-being in geoparks as well as these visitors' motivations for visiting them. Such motivations include: 1) a health and well-being motivation; 2) an environmental and geological motivation based on the biodiversity present in geoparks and its effect on health; 3) a psycho-therapeutic motivation, including with regard to stress reduction; and 4) social motivations. Hypotheses are drawn from the literature review section. The third section presents the study's methodology, which involved collecting data from the tourist office at the Geoparque Villuerca-Ibores-Jara, located in the heart of the region of Extremadura, Spain. We tested the model according to the partial least squares structural equation modelling (SEM-PLS) method. The fourth section delves into the results, providing the parameters for testing the validity and the reliability of the model as well as the significance of the hypotheses. In the fifth section, the results are compared with the findings discussed in the literature review, with the sixth section then drawing the key conclusions from this exercise as well as discussing the study's limitations and future lines of research.

2. Literature review

2.1. Health and well-being motivation in geoparks (HWM)

The relationship between health and well-being depends on factors such as the patterns that societies follow. In some societies, nature-based tourism has become mainstream, while in others it is still competing with other types of tourism [27]. The association depends in other cases on tourists' choices, as perceptions of physical and mental health factors can vary [28].

Generally, three factors define health and well-being motivation (HWM): the search for health, increasing knowledge of the place and relaxation [29]. According to Capaldi et al. [30], the pursuit of health and well-being is closely linked to resting in a natural space, as it improves mood and cognition. According to Neal et al. [31] (p. 4) research, the main reasons why seniors visit natural areas include 'to enjoy nature and the beauty of the natural environment', 'to escape from my daily routine' and 'to learn new things about nature'.

Due to their unprecedented time available to travel [32], senior tourists represent ideal visitors for destinations that can offer them the chance to engage in activities that can complement their well-being, such as learning about the history and the culture of the destination [25]. If tourism is understood as a break from one's daily routine, senior tourism activities can be regarded as means of giving older people content and meaning to their days [33]. Visits to geoparks can provide powerful and multifaceted information and lasting experiences of physical and sensory well-being, as well as represent an escape from everyday life [34].

Activities in a natural space do not only contribute to general well-being; they also help improve visitors' mental health [35,36]. The change of activity that travel entails can make it highly beneficial for older people's mental and emotional health. Previous research has substantiated the close links between nature, mental health and tourism [37,38].

In the case of senior tourism, the positive relationship between subjective well-being and health is particularly pronounced, providing necessary cognitive and emotional stimulation for older people [31,39]. Senior tourism provides opportunities for older adults to engage in enjoyable activities, form meaningful relationships, explore personal values, and achieve travel-related goals.

2.2. Social tourism programme (ST)

One of the factors contributing to the growth of senior tourism is social tourism, which is specifically oriented towards disadvantaged and low-income groups [40]. Social tourism provides a series of stimuli that are not only economic, but that also pertain to socio-labour, welfare, and social inclusion, and thereby contribute decisively to the sustainability of destinations [41]. It seems logical to consider that senior tourism should no longer be treated as a non-seasonal type of tourism. Due to the free time available to many older people, it is possible to concentrate this kind of tourism in those months when less tourism in general occurs. Social tourism is in

the base of any type of senior tourism's motivation destinations [42,43].

Since the pandemic, policy makers have started to establish formulas to minimise mass tourism [44–48]. Instead, many are seeking to stimulate higher levels of well-being and health through strategies that are fairer, more equitable and more ecologically sustainable for tourists and local inhabitants alike [49]. In Spain, these changes are being made almost exclusively by the public sector, through social programmes such as ‘Vacaciones’ and ‘Balnearios del IMSERSO’; moreover, in Europe more generally, the ‘Europe Senior Tourism’ programme has been launched. By contrast, the private sector has, to date, offered practically nothing. Taking in account public incentives, senior tourism can be regarded as leisure time promoted mainly through social policies [50]. States have become increasingly aware of the importance of enhancing older tourists' well-being and health and, accordingly, have recently started to offer trips to relevant destinations [51]. Public senior tourism programmes are improving health and wellness [26,29,32,52], accessing necessary medical and health care [53] and seeking memorable experiences [54,55]. The previous section allows us to introduce [Hypothesis 1](#).

Hypothesis 1. Social Tourism (ST) have a positive and significant influence in Senior tourists' health and well-being motivation (HWM).

2.3. Environmental and geological motivation (EGM)

Geoparks are very attractive for tourist due to their environmental, cultural and geological characteristics. Geoparks offer considerable geological and natural diversity, which not only promotes visitors' exposure to geological riches unavailable elsewhere, but also enables them to learn about the origin and conservation of the subsoil and its relationship with the environment [8].

The non-material benefits of ecosystems include mental health and well-being as well as peace and stability based on aesthetic values. These values are inspired by the richness of the landscape, which allows for cultural, environmental, geological or heritage experiences [56]. Those attributes provide a natural ecosystem to increase well-being and health of tourists [57]. This ecosystem regulates the biodiversity of the natural environment and allows visitors to have authentic experiences in relation to the animal and plant diversity of protected areas [58]. Geoparks stand out from other green spaces because of their valuable landscapes and natural features and can contribute to people's personal health and well-being [59].

In this way, the creation and conservation of protected natural areas now forms part of noteworthy regional strategies for attracting tourists towards a sustainable development environment [34–43,45–60]. These paragraphs introduce the following hypotheses.

Hypothesis 2. Social Tourism (ST) have a positive and significant influence Senior tourists' Environmental and Geological Motivation (EGM).

Hypothesis 3. Senior tourists' Environmental and Geological Motivation (EGM) have a positive and significant influence in Senior Tourism's Psycho-therapeutic Motivation (PTM).

Hypothesis 4. Senior tourists' Environmental and Geological Motivation (EGM) have a positive and significant influence in Senior Tourism's Social Motivation (SM).

2.4. Psycho-therapeutic motivation (PTM)

According to Jiricka-Pürrier et al. [61], geoparks provide emotional as well as physical benefits by reducing harm, pain and tension as well as negative emotional symptoms such as depression and stress. Buckley [27] has shown that there is a direct link between visits to protected areas and individual mental health and well-being. Natural parks and geoparks provide therapeutic value to visitors based on their environmental and natural conditions, where harmony and tranquillity reign in the conditions of wild nature. Such therapeutic value, essential to reducing stress, also derives from observing plant species, engaging with the topography of the terrain or smelling the vegetation [22].

Natural areas improve therapeutic values [62]. An example of these is how Geoparks often have higher air quality than urban areas, which can be beneficial for respiratory health [63,64]. Besides, natural environments provide ecosystem services that mitigate allergies and reduce all-cause, respiratory, cardiovascular and cancer mortality [65].

Also, therapeutic values add in physical activities can help reduce stress [66] and anxiety, issues that many people experience in fast-paced cities [67]. Furthermore, this exercise enables cardiovascular health and mitigate risk factors like diabetes and obesity [68].

The geoparks provide positive feelings, greater resilience in the face of pain and other negative circumstances that day-to-day life entails and that affect the of stress levels [69]. People may experience reduced stress levels by enjoying the tranquillity of these natural settings. In addition, the calm and the natural sound can help to reduce the stress associated with the diversity of noises in cities, improving cognitive performance [70]. United all these factors, nature and wild landscapes benefit the psychological state of people [62].

Happiness is a complex and multifaceted emotion [71] deeply intertwined with human psychology and well-being [72]. In recent years, the recognition of the therapeutic value of natural environments, such as geoparks, has gained prominence in enhancing emotional and psychological health [27]. Geoparks as “emotional sanctuaries” are designated areas of geological significance, are often characterized by awe-inspiring landscapes, ancient rock formations, and stunning natural views [73]. These unique environments offer a range of emotional benefits that contribute to overall happiness and well-being [74,75]. Similarly, nature has a restorative effect on emotions, reducing feelings of anger, sadness, and anxiety and increasing happiness. Geoparks provide a serene, natural setting for emotional healing and rejuvenation.

Hypothesis 5. Senior tourists' (PTM) have a positive and significant influence in Senior Tourism's Health and Well-being motivation (HWM).

Hypothesis 6. Social Tourism' (ST) have a positive and significant Senior tourists' (PTM).

2.5. Social motivations (SM)

Visits to natural places such as geoparks provide an opportunity to socialise and maintain connections with other people [76,77], benefits that contribute significantly to both personal and social development [78].

Protected areas are becoming increasingly important in providing recreational ecosystem services [79]. Socialising is a crucial aspect of tourism as it promotes cultural exchange and understanding between different communities [80]. Visiting a natural park may constitute a great opportunity to spend time with friends or family, which can help improve social connections and overall well-being.

When people from different backgrounds and cultures interact, they learn from each other and develop a deeper understanding of each other's customs and ways of life. Such interaction can also help break down any stereotypes and prejudices that exist between different communities, promoting peaceful coexistence and harmony [81].

Many seniors need to socialise due to the isolation and lonely, health issues or the loss of a spouse. For this reason, socialising through tourism can help alleviate these feelings of loneliness and enhance individuals' mental and emotional well-being [82]. Seniors who engage in tourism activities are more likely than their counterparts to remain physically active, promoting their overall health and well-being [83]. Geoparks offer a unique opportunity for seniors to explore the beauty of nature while socialising with others. They often offer various activities, such as hiking, bird watching and nature walks, which can provide seniors with a chance to enjoy the outdoors and interact with like-minded individuals. Additionally, these activities can help stimulate their minds and keep them mentally alert, reducing their risks of cognitive decline [84,85].

Nature tourism and tourist recreation in natural spaces in the company of others is part of the activities offered to disconnect participants from the hustle and bustle of everyday life in cities [76,86]. In fact, some studies have shown that if people were not to participate in these leisure activities, healthcare costs would increase by 7,5 % over what some health authorities have predicted [87]. These costs include treatment, carers, lost productivity in the workplace and increased anti-social behaviours, both public and domestic [27].

Hypothesis 7. Senior Tourism's Social motivation (ST) has a positive and significant influence in Senior Tourism's Social motivation (SM).

Hypothesis 8. Senior Tourism's Social motivation (SM) has a positive and significant influence in Health and Well-being motivation (HWM).

3. Methodology

3.1. Data collection

In order to collect our data, we relied on the collaboration of the tourism office of Guadeloupe. During January 2023, we held several meetings with professionals from the tourist office to determine each of the indicators we would use in our research. As a result of these meetings, we refined our questionnaire, eliminating some questions and reworking the content of others to make them more understandable for senior tourists visiting the geopark. During February and March 2023, we collected a total of 398 questionnaires

Table 1
Demographic characteristics of visitors (n = 398).

		Residents	Frequency
Gender	Female	242	61 %
	Male	156	39 %
	Total	398	100 %
Age	65–69	259	65 %
	70–74	139	35 %
	Total	398	100 %
Populated areas	Urban areas	342	86 %
	Rural areas	56	14 %
	Total	398	100 %
Education	None	10	3 %
	Primary	40	10 %
	Secondary	95	24 %
	High School	130	33 %
	Vocational training	59	15 %
	University	61	15 %
	Do not know or refuse to answer	3	1 %
	Other	0	0 %
	Total	398	100 %

which all participants provided informed consent to participate in the study. All questionnaires included the information of the ethical approval from the Ethics Committee of University of Extremadura with the reference 07–2023. Besides, before the data collection, the research team explained to the customers that participation was entirely voluntary and they gave any information about the ethical consent and the develop of the questionnaires.

The researchers have used a convenience sampling. This method depends on the ease of access to subjects such as surveying customers at passers-by on a tourist office in two towns closed to the Geopark selected. Due to travel officers are usually in touch with tourist is has been easy to collect the required data. The research team have nearly no authority to select the sample elements, and it's purely done based on proximity. They were disseminated among tourists in the main town closed to the Geopark, called Guadalupe. The scientific purpose of the work – aiming to ascertain senior tourists' motivations for visiting the Geopark Villuerca-Ibores-Jara – was explained at the beginning of the questionnaire. According to Zimmer et al. [88], we divided the questionnaire into two intervals for ages between 65 and 74. Level of education and gender were other variables we considered (see Table 1).

We obtained our constructs from our literature review. They pertained to different aspects of the theoretical framework and revolved around the HWM of tourists visiting the Geoparque Villuerca-Ibores-Jara. Five constructs and 17 indicators are displayed in Table 2.

3.2. Model-based explanations

Health and wellbeing motivations in geoparks are multifaceted, interconnected, and vital for fostering a holistic sense of wellness. Beyond the obvious environmental and geological motivations, geoparks offer a unique opportunity for social tourism, psycho-therapeutic engagement, and the cultivation of social connections. These motivations contribute to physical health, mental well-being, and social inclusion. Recognizing and promoting these diverse motivations can enrich the visitor experience, enhance the sense of community, and ultimately lead to improved overall health and quality of life in geoparks. As we continue to explore the interconnectedness of geology, environment, and human health, geoparks serve as a shining example of the powerful synergy between nature and wellbeing as it is explained in Fig. 1.

Fig. 1 shows the relation between the five constructs: social tourism promotes senior tourist in Geoparks (SM), health and well-being motivation (HWM), environmental and geological motivation. Biodiversity in geoparks and its effect on health (EM), psycho-therapeutic motivation. Stress reduction and the therapeutic value of geoparks (PTM) and social motivations (SM).

3.3. Data processing

Using SmartPLS for SEM provides a robust methodology for assessing the impact of senior tourism on well-being. The analysis

Table 2
Indicators of the model.

Constructs/ indicators	Indicators	Authors
HWM: Health and wellbeing motivation		
HWM 1	Senior tourists are motivated to improve their health and learning about the history and the culture of the destination	[26,32]
HWM 2	Well-being is closely linked to resting in a natural space	[30]
HWM 3	Natural space helps improve senior tourists' mental and physical health	[31,35,36,39]
HWM 4	Change of activity benefits emotional health	[37,38]
ST: Social tourism programme		
ST1	Social tourism provides an economic nature, socio-labour, welfare, and social inclusion stimuli to senior tourists to visit the geopark	[40,41]
ST2	Senior tourism provides information to policy makers to promote health and well-being and avoid mass tourism	[44–46,48]
ST3	Senior tourism contributes to the sustainability of the destination	[87]
ST4	The geopark offers memorable experiences to senior tourists	[54,55]
EGM: Environmental and geological motivation		
EGM1	Geoparks offer geological and natural diversity and facilitate learning	[8]
EGM2	Geoparks provide peace and stability based on aesthetic values based on the richness of the landscape	[56]
EGM3	Ecosystem regulates the biodiversity of the natural environment, providing authentic experiences	[58,59]
EGM4	Conservation of protected natural areas is a strategy for attracting tourists towards a sustainable development environment	[34–43,45–60]
PTM: Psycho-therapeutic motivation		
PTM1	Geoparks produce physical benefits by reducing depression and stress	[61–66]
PTM2	Geoparks often have higher air quality than urban areas, which can be beneficial for respiratory health	[63,64]
PTM3	Natural environments reduce all-cause, respiratory, cardiovascular and cancer mortality	[65–68]
PTM4	The geoparks provide positive feelings, greater resilience in the face of pain and other negative circumstances	[69]
PTM5	The calm and the natural sound can help to reduce the stress associated with the diversity of noises in cities, improving cognitive performance	[62]
SM: Social motivations		
SM1	Geoparks provide an opportunity to socialise and maintain connections with other people	[76,77]
SM2	Socialising promotes cultural exchange and understanding between different communities	[80]
SM3	Alleviate feelings of loneliness and enhance mental and emotional well-being	[82]

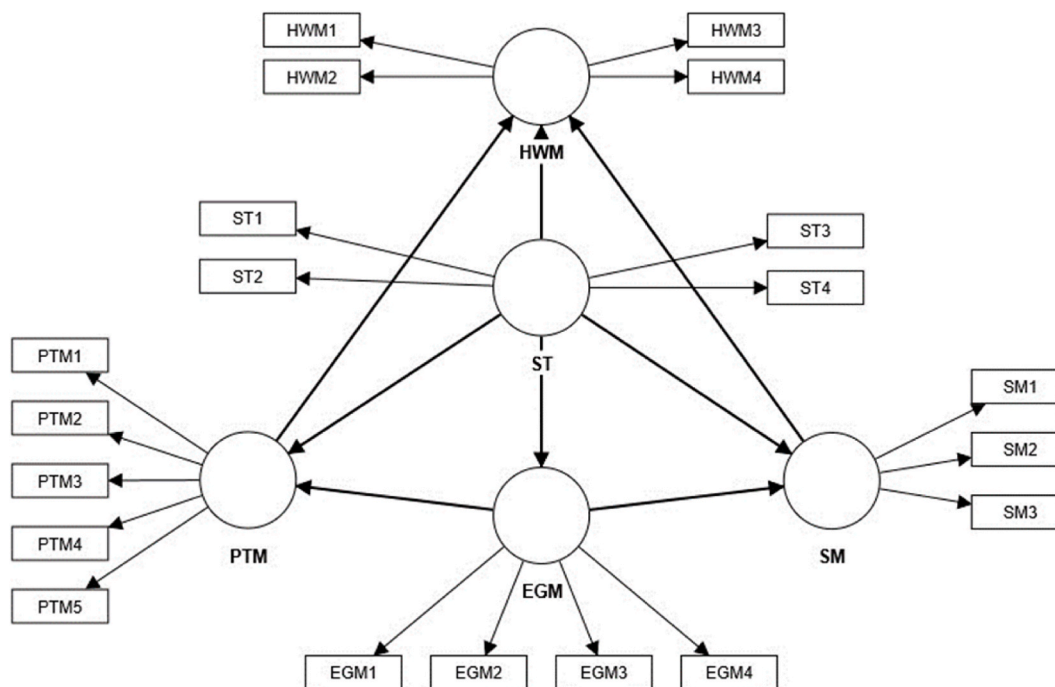


Fig. 1. Model-based explanations.

involves developing a measurement model, collecting data through surveys, and conducting analyses with SmartPLS to assess the relationships between constructs. This methodology allows researchers to gain insights into the complex relationships between senior tourism experiences and various dimensions of well-being, contributing to a deeper understanding of the effects of senior tourism on individuals' overall well-being.

The research design utilizes a cross-sectional approach to gather data from senior tourists. It involves collecting self-reported measures of senior tourists' experiences and well-being indicators. The study aims to assess the relationships between senior tourism as the independent variable and various dimensions of well-being as the dependent variables.

The first step is to develop a measurement model, which includes operationalizing constructs related to senior tourism and well-being. Constructs can be identified based on existing literature and theoretical frameworks. Each construct is measured using multiple items or indicators, which are rated on a Likert scale. Data is collected through surveys administered to senior tourists. The surveys include the items for each construct identified in the measurement model. Participants are recruited from senior travel agencies, tourism organizations, or online communities. To ensure an adequate sample size, a power analysis can be conducted based on the expected effect size and desired statistical power.

The collected data is analysed using SmartPLS, a software package specifically designed for SEM. The analysis involves two steps: assessment of the measurement model and examination of the structural model. 1) Measurement Model Assessment: The measurement model is assessed to evaluate the reliability and validity of the constructs. This includes assessing the internal consistency of the indicators using Cronbach's alpha and composite reliability. Convergent validity is examined through factor loadings and average variance extracted (AVE). Discriminant validity is assessed by comparing AVE with the square of the correlations between constructs. 2) Structural Model Examination: The structural model is analysed to investigate the relationships between senior tourism and well-being constructs. Path coefficients are estimated to determine the strength and significance of the relationships. Bootstrapping is applied to generate confidence intervals and test the significance of the path coefficients.

According to Hair et al. [89], SEM-PLS is often used in exploratory research or theory development. It allows researchers to test a wide range of hypotheses and relationships without relying on pre-specified models. Such flexibility is useful when the research question is not well-defined or when there is little prior knowledge about the relationships between variables.

We opted for SEM-PLS over covariance-based SEM techniques based on the complexity of the model and the latent variables [90]. Due to the recently evolved meaning of health and well-being through the pandemic era and the complexity of determining the content of senior tourists' motivations for visiting the geopark, we deemed SEM-PLS more appropriate than covariance-based SEM techniques. By contrast, co-variance-based SEM techniques can be more sensitive to misspecification, potentially resulting in biased estimates [91]. Further, SEM-PLS is more robust than covariance-based SEM techniques when dealing with non-normal data [92]. This is because it does not rely on the assumption of normality, which can be violated in real-world data.

4. Results

4.1. Measurement model assessment

Evaluating a PLS-SEM reflective measurement model is a rigorous process that requires multiple analyses and tests to ensure the reliability and validity of the scales and the internal and external consistency of the model. External loadings refer to the correlations between latent variables and observed variables or indicators. In other words, external loadings represent the strength of the relationship between each latent variable and its indicators. In the PLS-SEM reflective measurement model, external loadings are expected to be > 0,7 [93] for each indicator on its corresponding latent variable. As shown in Table 3, external loadings determine the absolute contribution of an item to its construct. In the case of our research, this was true in all cases except SM4 and HWM2.

In order to analyse the fulfilment of the research hypotheses, Fig. 2 includes the conceptual model with its values.

To study validity and reliability, we analysed the parameters shown in Table 4. The values range from 0 to 1 [94]. All conditions are met.

It is important to note that the Fornell-Larcker criterion only assesses discriminant validity indirectly, through comparing the average variance extracted (AVE) and correlations [95]. Furthermore, the criterion does not consider the possibility of a latent variable being related to variables that are not included in the model, which may affect discriminant validity (see Table 5).

The HTMT was proposed by Henseler, Ringle and Sarstedt in 2015 as an alternative to the Fornell-Larcker criterion for assessing discriminant validity in PLS-SEM [96]. The HTMT is based on comparing the correlations between latent variables with the indicators of each latent variable [97]. The HTMT is calculated as the correlation between two latent variables divided by the square root of the product of the average correlations between the indicators of each latent variable. If the HTMT is less than 0,90, discriminant validity is considered to exist between the two latent variables (see Table 6).

Table 7 shows several fit indices used to evaluate the overall fit of the model. These are: 1) SRMR measures the discrepancy between the observed and predicted covariance matrices. Values below 0,08 of SRMR indicate better model fit, in this case, 0,079 is accepted [98]. 2) d_ULS is a measure of the overall model fit based on the discrepancy between the observed and predicted covariance matrices. Lower values of d_ULS indicate better model fit, but the specific threshold for acceptable fit may vary depending on the context. 3) d_G is another measure of model fit that evaluates the discrepancy between the observed and predicted covariance matrices. Similar to d_ULS, lower values of d_G indicate better model fit. 4) Chi-square (χ^2): Chi-square is a statistical test that compares the observed covariance matrix with the model-implied covariance matrix. However, the chi-square test is sensitive to sample size, often leading to significant chi-square values even for relatively small discrepancies. Therefore, it is recommended to consider other fit indices in conjunction with chi-square. 5) NFI is a relative fit index that compares the fit of the estimated model with the fit of a null model (a model with no relationships between the variables). NFI values range from 0 to 1, with values closer to 1 indicating better fit. NFI.

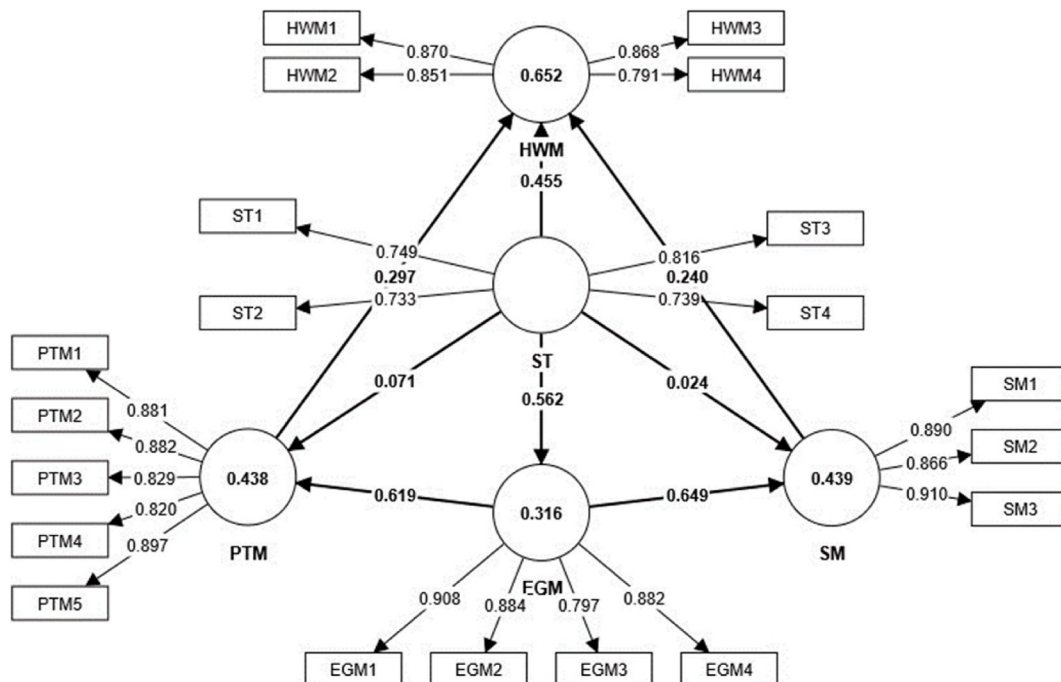


Fig. 2. Conceptual model with its values.

Table 3
External loadings.

	EGM	HWM	PTM	SM	ST
EGM1	0,908				
EGM2	0,884				
EGM3	0,797				
EGM4	0,882				
HWM1		0,870			
HWM2		0,851			
HWM3		0,868			
HWM4		0,791			
PTM1			0,881		
PTM2			0,882		
PTM3			0,829		
PTM4			0,820		
PTM5			0,897		
SM1				0,890	
SM2				0,866	
SM3				0,910	
ST1					0,749
ST2					0,733
ST3					0,816
ST4					0,739

Table 4
Reliability and validity conditions of the constructs.

	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
EGM	0,892	0903	0,925	0755
HWM	0,866	0871	0,909	0714
PTM	0,914	0917	0,936	0744
SM	0,867	0869	0,919	0790
ST	0,762	0792	0,845	0578

Table 5
Discriminant validity: the Fornell-Larcker criterion.

	EGM	HWM	PTM	SM	ST
EGM	0,869				
HWM	0,672	0845			
PTM	0,659	0658	0,862		
SM	0,663	0627	0,707	0889	
ST	0,562	0673	0,419	0389	0,760

Table 6
Discriminant validity: the heterotrait-monotrait (HTMT) ratio.

	EGM	HWM	PTM	SM	ST
EGM					
HWM	0,760				
PTM	0,720	0736			
SM	0,744	0721	0,796		
ST	0,660	0803	0,471	0445	

Table 7
Goodness of fit tests.

	Saturated Model	Estimated model
SRMR	0,073	0094
d_ ULS	1106	1838
d_G	0,602	0655
Chi- square	1426,832	1490,284
NFI	0,769	0759

4.2. Structural model assessment

In SEM-PLS, the hypotheses are expressed in terms of regression coefficients (beta). The regression coefficients indicate the strength and the direction of the relationship between the variables in the model. According to Cepeda-Carrion et al. [99], to assess the statistical significance of the regression coefficients, confidence intervals, Student's t-tests and P-values can be used. The confidence interval indicates the range in which the true value of the regression coefficient is likely to lie, at a certain level of confidence. For example, a 95 % confidence interval indicates that there is a 95 % probability that the true value of the regression coefficient lies within the interval. Student's t-test is used to assess whether the regression coefficient is significantly different from zero. A t-value greater than 1,96 (at a 5 % significance level) indicates that the regression coefficient is significantly different from zero. The P-value indicates the probability of obtaining a t-value as extreme or more extreme than the observed value, under the null hypothesis that the regression coefficient is equal to zero. A P-value less than 0,05 indicates that the regression coefficient is significantly different from zero (Table 8).

Two coefficients are used to assess the model's ability to explain and predict the variables of interest: the coefficient of determination R^2 and the coefficient of prediction Q^2 .

The coefficient of determination R^2 indicates the amount of variance in the out-come variable that can be explained by the predictor variables in the model. In SEM-PLS, R^2 is calculated as the explained variance of the latent outcome variable divided by its total variance. An R^2 of 1 indicates that all predictor variables in the model fully explain the variance in the outcome variable, while an R^2 of 0 indicates that the predictor variables do not explain the variance in the outcome variable. This indicates the amount of variance of a construct that is explained by the predictor variables of the endogenous construct, whose values range from zero to one. Chin [100] considers 0,67, 0,33 and 0,10 substantial, moderate and weak, respectively.

The prediction coefficient Q^2 is used to assess the ability of the model to predict the outcome variable outside the sample used to estimate the model. In SEM-PLS, Q^2 is calculated as the difference between the total variance of the outcome variable and the variance not explained by the model, divided by the total variance of the outcome variable. A Q^2 of 1 indicates that the model has perfect ability to predict the out-of-sample outcome variable, while a Q^2 of 0 indicates that the model has no ability to predict the out-of-sample outcome variable. The effect size Q^2 allows one to assess how an exogenous construct contributes to an endogenous latent construct Q^2 as a measure of predictive relevance, which can be small (0,02), medium (0,15) or large (0,35) [89] (see Table 9).

5. Discussion

According to the results, senior tourists regard the Geoparque Villuerca-Ibores-Jara as a place where they can improve their health and well-being.

The interest of senior tourists in improving their health by visiting the Villuerca-Ibores-Jara Geopark explains the success of public policies aimed more at disadvantaged and low-income groups [40]. The study of the health, therapeutic and environmental motivations of senior tourists provide sufficient information for public authorities to continue promoting social tourism through programmes that stimulate welfare, socio-labour and social inclusion aspects. The results obtained contribute to the sustainability of the destinations [41] not only because they are largely fulfilling the purpose for which they were designed such as the exposure of territories, with clearly defined boundaries, that host a geological heritage of international relevance used as a basis for their sustainable socio-economic development.

They also allow contributing to a social function that contributes to the improvement of tourists' health and their social development as individuals. Moreover, social tourism helps the sustainability of geoparks by reducing mass tourism [44–48]. Through non-seasonal tourism it is possible to design a sustainable visitation policy throughout the year that reduces the possible negative impact of tourists on geological heritage conservation [47,48]. The results obtained are in line with recent policies taken by the authorities following the pandemic. These measures have focused on developing fairer, more equitable and ecologically sustainable strategies for both tourists and local people [49].

This finding confirms most of the hypotheses and corroborate that Geo/Natural Parks offer physical and emotional benefits, as well as fostering social connections that contribute to community cohesion [101].

Results shows a strong relationship between social tourism and environmental and geological motivation (H2: ST→EGM: $\beta = 0,562$; $T = 22,898$; P-value = 0,000) and health and wellbeing motivation (H1: ST→HWM: $\beta = 0,455$; $T = 13,653$; P-value = 0,000). According to the senior tourist involved in the study both motivations are in the base of the social programmes run by public states. As

Table 8
Hypotheses testing with confidence intervals, t-statistics and P values in PLS-SEM.

		Beta	2,5 %	97,5 %	T statistics (O/STDEV)	P values	Significance of the hypotheses
H1	ST→HWM	0,455	0388	0,518	13,653	0,443	No
H2	ST→EGM	0,562	0515	0,610	22,898	0,006	Yes
H3	EGM→PTM	0,619	0520	0,715	12,416	0,000	Yes
H4	EGM→SM	0,649	0564	0,728	15,648	0,000	Yes
H5	PTM→HWM	0,297	0204	0,394	6007	0,000	Yes
H6	ST→PTM	0,071	−0,033	0178	1322	0,000	Yes
H7	ST→SM	0,024	−0,075	0124	0,470	0000	Yes
H8	SM→HWM	0,240	0147	0,332	5131	0,000	Yes

Table 9
Variance explained (R-square) and predictive relevance (Q-square).

	R-square	Q-square
EGM	0,316	0225
HWM	0,652	0455
PTM	0,438	0288
SM	0,439	0287

public administration has become increasingly aware of the importance of enhancing older tourists' well-being and health [51] they commonly link the subsidized trips to get closer to the environment as well as wellbeing activities [26,29,32,52], accessing necessary medical and health care [53] and seeking memorable experiences [54,55].

As a result, environmental and geological activities play a key role in improving the older people's therapeutic conditions (H3: EGM→PTM: $\beta = 0,619$; $T = 12,416$; $P\text{-value} = 0,000$). Those natural activities are relevant to provide those healthy conditions, otherwise it would not had been possible (H6: ST→PTM: $\beta = 0,071$; $T = 1322$; $P\text{-value} = 0,186$). According to Jiricka-Pürerrer et al. [61], senior tourists are enabled to experience emotionally positive feelings environmental geological motivation and a positive impact on older people's therapeutic conditions. Unsurprisingly given that a large proportion of our respondents came from large cities (86 %), they particularly highlighted the quality of the air in the geopark (see also [62,63], another factor that stands in contrast with fast-paced city life [67]. Moreover, according to Chrousos [102], contact with nature reduces stress levels, digestive problems, and headaches. Average blood pressure also drops significantly after physical exercise in the open air, preferably in a natural environment. Natural areas enhance therapeutic values the simple act of contemplating beautiful scenery helps lower heart rate and can act as a powerful antidote to depression, anxiety, mental fatigue, and other disorders [60,61]. Although in recent years, there has been increasing attention given to the potential benefits of natural scenarios on mental health [37] Establishing a direct causal relationship between those natural scenarios and mental health outcomes can be complex due to various factors. Firstly, mental health is influenced by a multitude of personal, social, and environmental factors beyond the presence of natural parks alone [103]. Factors such as socio-economic status, access to healthcare, social support, and individual coping mechanisms can significantly impact mental well-being. It is challenging to isolate the effects of natural parks from these confounding factors and determine their exclusive contribution.

All these therapeutic factors affect the emotions of senior tourists. Emotions play a fundamental role in defining memorable experiences [104], receiving unprecedented recognition in the field of tourism but also because they drive individuals towards positive feelings [105], occupying the core of motivation [5]. They provide positive feelings, greater resilience to pain and other negative circumstances which come with daily life and that affect stress levels [66]. People can reduce stress levels by enjoying the tranquillity of these natural settings. In addition, calm and natural sound can help reduce the stress associated with the diversity of noise in cities, improving cognitive performance [67]. Combined with all these factors, nature and wild landscapes benefit the psychological state of people [63].

Results also channel positively the senior tourist's loneliness. It is one of the worries for many older people, needs to be tackled as one of the objectives of social tourism, especially that involving older people [102]. Thought environmental and geological activities seniors engage with different cultures, traditions, and communities, fostering intercultural understanding and tolerance (H4: EGM→SM: $\beta = 0,619$; $T = 15,648$; $P\text{-value} = 0,000$). Generally speaking, social tourism needs environmental activities to tackle loneliness, otherwise it would not be possible (H7: ST→SM: $\beta = 0,024$; $T = 0,470$; $P\text{-value} = 0,639$). By interacting with locals and fellow travellers, seniors can develop new perspectives, broaden their horizons, and challenge preconceived notions. This exposure to diverse social environments can lead to personal growth and enhance their social awareness. Furthermore, tourism serves as a catalyst for social interaction and companionship among seniors. Many seniors may face social isolation due to factors such as retirement, loss of loved ones, or limited social networks. Traveling allows them to connect with like-minded individuals and form new friendships. Group tours or senior-oriented travel programs facilitate social bonding, providing a sense of belonging and support. Such interactions contribute to mental and emotional well-being, combating feelings of loneliness and improving overall quality of life. Through the

Table 10
Variance explained of the constructs.

	Coefficient of determination (R ²)	Direct Effect	Correlation	Variance explained
HWM	0,652			
PTM		0,297	0658	0,195
ST		0,455	0673	0,306
SM		0,24	0,627	0150
PTM	0,438			0,652
ST		0,071	0419	0,030
EGM		0,619	0659	0,408
SM	0,439			0,438
EGM		0,649	0663	0,430
ST		0,024	0389	0,008
EGM	0,316			0,439
ST		0,562	0562	0,316

public policies of IMERSO travel, not only are the health and well-being of seniors being improved [51], but through providing opportunities to socialise, their feelings of loneliness are being alleviated, too [82]. The desire to maintain physical fitness and vitality is a common driver for engaging in travel activities. Exploring new destinations often involves physical exertion, such as walking tours or outdoor adventures, which can improve cardiovascular health, muscular strength, and flexibility. Seniors who embark on travel experiences are more likely to engage in regular physical activity, thus reaping the benefits of an active lifestyle. Indeed, tourists are able to contemplate the beauty of the topography and nature [83] and disconnect themselves from the hustle and bustle of big cities [74,84].

These results are aligned when analysing the explanatory power of the model. Based on a coefficient of determination $R^2 = 0,652$, we can say that the amount of variance of the dependent variable (HWM) is significantly explained by the predictor variables of the endogenous constructs (PTM, EGM, SM). It should be noted that there is no considerable difference in the explanatory power of the endogenous variables. According to Table 10, 43,9 % of the R^2 (HWM) is explained by social motivation, 43,8 % by psycho-therapeutic motivation and 31,6 % by environmental and geological motivation. However, if HWM is decomposed into the three direct elements (PTM, ST, SM) is worth noticing that senior tourists consider that health and wellbeing activities depend on the defining social tourism programs (variance explained = 0,306). It explains the efficiency of these geological programs due to decisively contribute to improve their health and well-being.

These motivations reinforce the importance of the public authorities proposed investment in the geopark. The totality of experience with the environmental attributes that contributed to the therapeutic value of the space [65]. In this way, there is a need for better collaboration between protected areas and health institutions, transdisciplinary partnerships and effectively integrating scientific evidence into public policy, planning and management [106,107]. Also, implementing an interdisciplinary research program remains a priority to better comprehend the linkages between human health, ecosystem services and conservation policies at global scale [108].

6. Conclusions

This paper has highlighted previous studies which have indicated the importance of seniors' health and wellbeing motivations when visiting geoparks. The study allows us to draw conclusions to foster senior tourists' motivations for visiting a geopark. Geoparks are popular tourist destinations that attract visitors from all over the world due to their unique geological and cultural features. With their abundant natural and geological beauty, they offer a unique and enriching experience for senior tourists. Theoretical and practical implications are the following.

6.1. Theoretical implications

First, the rise of social tourism as a result of state policies and the growth of geoparks worldwide have presented a new but hitherto underexplored topic, of potential interest to researchers in different disciplines. After the COVID-19 pandemic, there has been a notable shift in the motivations and priorities of tourists. Environmental and geological motivations have gained increased importance, leading to the rise of social tourism that focuses on sustainable travel experiences [26,29,32,52]. The pandemic restricted travel options, and people found solace in nature and outdoor spaces during lockdowns [49]. According to Buckley [27], it has led to a growing interest in nature-based tourism experiences, such as hiking, camping, wildlife observation, and exploring national parks.

Second, public policies based on guaranteeing tourism – especially to disadvantaged people such as the elderly – are providing new opportunities to senior tourists [39,40]. To cater to the unique needs and preferences of senior tourists, public policies aimed at guaranteeing tourism can play a pivotal role. According to Cisneros-Martínez et al., [42]. implementing policies address transportation, infrastructure, education, and community involvement, governments, those ones guarantee an inclusive and enriching tourism experience for senior visitors.

Third, according to Stolton et al. [56], the distinguishing characteristics of geoparks – notably their geological heritage – are also becoming a source of appeal for senior tourists, many of whom seek to learn about these spaces' biodiversity. Senior tourists often seek opportunities to learn also about the history and the culture of the destinations they visit, geoparks may be of interest, because they offer the possibility of experiencing nature and geological [58].

6.2. Practical implications

First, according to Puhakka [56] senior tourists often seek opportunities to contribute to the preservation of the natural and cultural heritage of the places they visit, a real possibility in geoparks, which allow visitors to learn about these issues and engage in sustainable tourism practices, benefitting them in the long run. With a greater understanding of the fragility of ecosystems, tourists are actively seeking opportunities to support conservation efforts [60]. Ecotourism has gained popularity, with travellers engaging in activities that contribute to the preservation of natural habitats and wildlife. This may include volunteering for conservation projects, participating in reforestation initiatives, or supporting local sustainable development projects.

Second, senior tourists' practical motivations for visiting a geopark include, first, discover new destinations. Indeed, senior tourists often seek new destinations to explore and experience, qualities offered by geoparks, which provide a variety of unique experiences, such as hiking, guided tours and exploring geological landscapes [58].

Third, senior tourists may seek to improve their health and well-being [35,36]. As a result, Bratman et al. [37], and Williams, A., and Ólafsdóttir [38] consider psycho-therapeutic issues like blood circulation and cardiovascular function, which may entail increased

risks of heart disease and other chronic disorders. Geoparks are relevant because they offer a wealth of outdoor activities, such as hiking, walking, and cycling, which can improve fitness, strength and flexibility.

Fourth, senior tourists may look for social benefits [76–78]. According to Sirgy [77] geoparks are appealing because they allow senior tourists to interact with other visitors and participate in group activities, which can improve their quality of social life and thereby reduce their feelings of social isolation and improve their self-esteem.

The results of this study reinforce and add scientific knowledge about which fundamental is the preservation of nature's ecosystem services for the maintenance of human health, highlighting the benefits under the psychological-logical aspects. They also demonstrate that geoparks and protected areas, when fulfilling their objectives of protecting and managing the natural heritage, provide space for the integration of human beings with natural environments.

The study of tourist perceptions in geoparks have several limitations and challenges. Researchers have navigated through a diverse visitor demographics, limited sample sizes, language barriers, temporal factors, visitor interactions with local communities to gain a comprehensive understanding of tourist perceptions. Despite these challenges, addressing tourist perceptions in geoparks it has been crucial for developing a sustainable model of these unique geological and environmental treasures. Researchers and park managers have worked collaboratively to overcome these limitations and have provided visitors with meaningful, educational, and enjoyable experiences while preserving the geological heritage of these remarkable destinations.

The future research can be too focused on knowing the involvement of senior tourism in tourism activities related to sustainability and in learning about geoparks developing their knowledge of this protected areas. Besides, it will be studied how these activities improve the effects in the satisfaction of senior tourists.

Author declaration of interest statement

the authors declare no conflict of interest.

Data availability statement section

data are in the repository which hyperlinks is <https://shorturl.at/chN28>.

CRedit authorship contribution statement

Rafael Robina Ramírez: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Project administration, Resources, Software, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing. **María Martín Lucas:** Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Project administration, Resources, Software, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing. **Alline Dias:** Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Project administration, Resources, Software, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing. **Francisco Javier Castellano-Álvarez:** Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Project administration, Resources, Software, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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References

- [1] UNWTO, *Tourism Highlights*, 2018.
- [2] United Nations. Population ageing and development. Available online: www.un.org/en/development/desa/population/publications/pdf/ageing/2012PopAgeingandDev_WallChart.pdf(accessed Apr 08 2023).
- [3] Julio Pérez Díaz, Diego Ramiro Fariñas, Pilar Aceituno Nieto, Carlos Muñoz Díaz, Clara Bueno López, J. Sebastián Ruiz-Santacruz, Isabel Fernandez Morales, Ana Belén Castillo Belmonte, Julia De las Obras-Loscertales Sampérez, Begoña Villuendas Hijosa, "Un perfil de las personas mayores en España, 2022. Indicadores estadísticos básicos". Madrid, Informes Envejecimiento en red 29 (2022) 40 [Fecha de publicación: 30/09/2022].
- [4] M. Chand, R.L. Tung, The aging of the world's population and its effects on global business, *Acad. Manag. Perspect.* 28 (4) (2014) 409–429.
- [5] M.H. Pestana, A. Parreira, L. Moutinho, Motivations, emotions and satisfaction: the keys to a tourism destination choice, *J. Destin. Market. Manag.* 16 (2020), 10033, <https://doi.org/10.1016/j.jdmm.2018.12.006>.
- [6] Christine A. McGladdery, Berendien A. Lubbe, Rethinking educational tourism: proposing a new model and future directions, *Tourism Review* (2017), <https://doi.org/10.1108/tr-03-2017-0055>.
- [7] R. Patuelli, P. Nijkamp, Travel motivations of seniors: a review and a meta-analytical assessment, *Tourism Econ.* 22 (4) (2016) 847–862, <https://doi.org/10.1177/1354816616654257>.
- [8] L. Chen, W. Chen, Push–pull factors in international birders' travel, *Tourism Manag.* 48 (2015) 416–425, <https://doi.org/10.1016/j.tourman.2014.12.011>.

- [9] J. Nunes, H. Sá, A. Termalismo Freitas, turismo de saúde e bem-estar e turismo sénior: contributos para o turismo sustentável nos Açores. *Turismo sénior: Abordagens, sustentabilidade e boas práticas*, 2021.
- [10] A.G. Vijaya, *Tourism Industry in India: Performance Evaluation of Tourism in Andhra Pradesh*, A Ph.D Research Design, Seminar Submitted to Rayalaseema University Kurnool, Andhra Pradesh, 2016.
- [11] J. Mendes, S.G. Costa, T. Medeiros, Senior tourism in são miguel island – azores: proposal for a religious and cultural route, in: Á. Rocha, C. Ferrás, A. Méndez Porras, E. Jimenez Delgado (Eds.), *Information Technology and Systems. ICITS 2022. Lecture Notes in Networks and Systems*, vol. 414, Springer, Cham, 2022, https://doi.org/10.1007/978-3-030-96293-7_15.
- [12] É. Fernandes-Pinto, M. de A. Irving, Sacred natural sites: ancient values and new challenges for nature protection policies, *Desenvolv. Meio Ambiente* 40 (2017) 275–296, <https://doi.org/10.5380/dma.v40i0.47843>.
- [13] C. Eusébio, M.J. Carneiro, E. Kastenholz, H. Alvelos, Social tourism programmes for the senior market: a benefit segmentation analysis, *J. Tourism Cult. Change* 15 (1) (2017) 59–79, <https://doi.org/10.1080/14766825.2015.1117093>.
- [14] G. Prayag, S. Hosany, When Middle East meets west: understanding the motives and perceptions of young tourists from United Arab Emirates, *Tourism Manag.* 40 (2014) 35–45, <https://doi.org/10.1016/j.tourman.2013.05.003>.
- [15] R.B. Singh, D. Wei, S. Anand, *Global Geographical Heritage, Geoparks and Geotourism*, Springer, Singapore, 2021, p. 483p, <https://doi.org/10.1080/14766825.2015.1117093>.
- [16] L. Hakim, B. Rahardi, D.A. Guntoro, N.I. Mukhoyyarah, Coffee landscape of banyuwangi geopark: ecology, conservation, and sustainable tourism development, *Journal of Tropical Life Science* 12 (1) (2022) 107–116, <https://doi.org/10.11594/jtls.12.01.11>.
- [17] S. Sagala, A. Rosyidie, M.A. Sasongko, M.M. Syahbid, Who gets the benefits of geopark establishment? A study of batur geopark area, bali province, Indonesia, in: IOP Conference Series: Earth and Environmental Science, vol. 158, IOP Publishing, 2018, 012034, <https://doi.org/10.1088/1755-1315/158/1/012034>. No. 1.
- [18] N.T. Farsani, C. Coelho, C. Costa, *Geoparks and Geotourism: New Approaches to Sustainability for the 21st Century*, Universal-Publishers, 2012.
- [19] N.S.M. Fauzi, A. Misni, Geoheritage Conservation: indicators affecting the condition and sustainability of Geopark—a conceptual review, *Procedia-Social and Behavioral Sciences* 222 (2016) 676–684, <https://doi.org/10.1016/j.sbspro.2016.05.224>.
- [20] S. McCabe, G. Qiao, A review of research into social tourism: launching the annals of tourism research curated collection on social tourism, *Ann. Tourism Res.* 85 (2021), 103103, <https://doi.org/10.1016/j.annals.2020.103103>.
- [21] Nate Seltenrich, Just what the Doctor Ordered: Using Parks to Improve Children’s Health, 2015, <https://doi.org/10.1289/ehp.123-a254>.
- [22] R. Gabriel, H. Moreira, A. Alencão, A. Faria, E. Silva, A. Sá, An emerging paradigm for the UNESCO global geoparks: the ecosystem’s health provision, *Geosciences* 8 (3) (2018) 100, <https://doi.org/10.3390/geosciences8030100>.
- [23] C.K. Fung, C.Y. Jim, Segmentation by motivation of Hong Kong Global Geopark visitors in relation to sustainable nature-based tourism, *Int. J. Sustain. Dev. World Ecol.* 22 (1) (2015) 76–88, <https://doi.org/10.1080/13504509.2014.999262>.
- [24] R. Robina-Ramírez, A. Fernández Portillo, What role does tourists educational motivation play in promoting religious tourism among travellers? *Annals of Leisure Research* 23 (3) (2020) 407–428, <https://doi.org/10.1080/11745398.2018.1561309>.
- [25] E. Alen, J.L. Nicolau, N. Losada, T. Dominguez, Determinant factors of senior tourists’ length of stay, *Ann. Tourism Res.* 49 (2014) 19–32, <https://doi.org/10.1016/j.annals.2014.08.002>.
- [26] C. Oliveira, A. Brochado, A. Correia, Seniors in international residential tourism: looking for quality of life, *Anatolia* 29 (1) (2018) 11–23, <https://doi.org/10.1080/13032917.2017.1358189>.
- [27] R. Buckley, Is adventure tourism therapeutic? *Tour. Recreat. Res.* 46 (4) (2021) 553–557, <https://doi.org/10.1080/02508281.2021.1931775>.
- [28] H. Ramkissoon, Place affect interventions during and after the COVID-19 pandemic, *Front. Psychol.* 12 (2021), <https://doi.org/10.3389/fpsyg.2021.726685>.
- [29] A. Balderas-Cejudo, Towards a deeper understanding of senior tourists: challenges and opportunities of an emerging market segment, *Journal of Tourism and Heritage Research* 2 (2) (2019) 262–277, available at: <https://jthr.es/index.php/jour-nal/article/view/52/88>.
- [30] C.A. Capaldi, Raelyne L. Dopko, John M. Zelenski, The relationship between nature connectedness and happiness: a metaanalysis, *Frontiers* 5 (2014) 976, <https://doi.org/10.3389/fpsyg.2014.00976>.
- [31] J. Neal, J. Sirgy, M. Uysal, Measuring the effect of tourism services on travelers’ quality-of-life; further validation, *Journal of Social Indicators* 69 (2004) 243–249, <https://doi.org/10.1007/s11205-004-5012-3>.
- [32] T. Medeiros, A.I. Moniz, J. Mendes, O. Silva, L. Tomás, M. Sousa, S. Furtado, V. Vieira, J.A. Ferreira, *Turistas seniores: contributos para a caracterização No destino Açores, Turismo Sénior No Destino Açores*, 2021, pp. 17–39.
- [33] E.L. Deci, R.M. Ryan, The “what” and “why” of goal pursuits: human needs and the self-determination of behaviours, *Psychol. Inq.* 11 (2000) 227–268, https://doi.org/10.1207/s15327965plii1104_01.
- [34] R. Puhakka, K. Pitkänen, P. Siikamäki, The health and well-being impacts of protected areas in Finland, *J. Sustain. Tourism* 25 (12) (2017) 1830–1847, <https://doi.org/10.1080/09669582.2016.1243696>.
- [35] M.R. Gabor, F.D. Oltean, Babymoon tourism between emotional well-being service for medical tourism and niche tourism. Development and awareness on Romanian educated women, *Tourism Manag.* 70 (2019) 170–175, <https://doi.org/10.1016/j.tourman.2018.08.006>.
- [36] L. Su, B. Tang, J. Nawijn, Eudaimonic and hedonic well-being pattern changes: intensity and activity, *Annals of Tourist Research* 84 (2020), <https://doi.org/10.1016/j.annals.2020.103008>.
- [37] G.N. Bratman, C.B. Anderson, M.G. Berman, B. Cochran, S. de Vries, J. Flanders, C. Folke, H. Frumkin, J.J. Gross, T. Hartig, et al., Nature and mental health: an ecosystem service perspective, *Sci. Adv.* 5 (7) (2019), <https://doi.org/10.1126/sciadv.aax0903>.
- [38] A. Williams, R. Ólafsdóttir, Nature-based tourism as therapeutic landscape in a COVID era: autoethnographic learnings from a visitor’s experience in Iceland, *GeoJournal* (2022) 1–18, <https://doi.org/10.1007/s10708-022-10713-5>.
- [39] N. Hazel, Holidays for children and families in need: an exploration of the research and policy contexts for social tourism in the UK, *Child. Soc.* 19 (2005) 225–236, <https://doi.org/10.1002/chi.838>.
- [40] A. Diekmann, S. McCabe, Systems of social tourism in the European Union: a critical review, *Curr. Issues Tourism* 14 (5) (2011) 417–430, <https://doi.org/10.1080/13683500.2011.568052>.
- [41] J.D. Cisneros-Martínez, S. McCabe, A. Fernández-Morales, The contribution of social tourism to sustainable tourism: a case study of seasonally adjusted programmes in Spain, *J. Sustain. Tourism* 26 (1) (2018) 85–107, <https://doi.org/10.1080/09669582.2017.1319844>.
- [42] Alexis Saveriades, Establishing the social tourism carrying capacity for the tourist resorts of the east coast of the Republic of Cyprus, *Tourism Manag.* 21 (2) (2000) 147–156, [https://doi.org/10.1016/s0261-5177\(99\)00044-8](https://doi.org/10.1016/s0261-5177(99)00044-8).
- [43] Lynn Minnaert, Robert Maitland, Graham Miller, Tourism and social policy: the value of social tourism, *Ann. Tourism Res.* 36 (2) (2009) 316–334, <https://doi.org/10.1016/j.annals.2009.01.002>.
- [44] M. Sánchez-Oro Sánchez, J. Castro-Serrano, R. Robina-Ramírez, Stakeholders’ participation in sustainable tourism planning for a rural region: Extremadura case study (Spain), *Land* 10 (6) (2021) 553, <https://doi.org/10.3390/land10060553>.
- [45] R. Robina-Ramírez, M.S.O. Sánchez, H.V. Jiménez-Naranjo, J. Castro-Serrano, Tourism governance during the COVID-19 pandemic crisis: a proposal for a sustainable model to restore the tourism industry, *Environ. Dev. Sustain.* (2021) 1–22, <https://doi.org/10.1007/s10668-021-01707-3>.
- [46] R. Robina-Ramírez, J.A. Medina-Merodio, L. Moreno-Luna, H.V. Jiménez-Naranjo, M. Sánchez-Oro, Safety and health measures for COVID-19 transition period in the hotel industry in Spain, *Int. J. Environ. Res. Publ. Health* 18 (2) (2021) 718, <https://doi.org/10.3390/ijerph18020718>.
- [47] R. Robina-Ramírez, M. Isabel Sánchez-Hernández, C. Díaz-Caro, Hotel manager perceptions about corporate compliance in the tourism industry: an empirical regional case study in Spain, *J. Manag. Govern.* 25 (2) (2021) 627–654, <https://doi.org/10.1007/s10997-020-09514-0>.
- [48] A. Sharma, J.L. Nicolau, An open market valuation of the effects of COVID-19 on the travel and tourism industry, *Ann. Tourism Res.* 83 (2020), <https://doi.org/10.1016/j.annals.2020.102990>.

- [49] S. McCabe, A. Diekmann, K. Kakoudakis, Human rights, disabilities and social tourism, in: *The Sage Handbook of Tourism Management: Applications of Theories and Concepts to Tourism*, SAGE, 2018, pp. 61–74, <https://doi.org/10.4135/9781526461490.n7>. ISBN 9781526461131.
- [50] A. Álvarez, *El ocio turístico en las sociedades industriales avanzadas*, A. Bosch. Álvarez, Barcelona, 2004, pp. 15–44.
- [51] C.M. Chen, S.H. Chen, H.T. Lee, T.H. Tsai, Exploring destination resources and competitiveness—A comparative analysis of tourists' perceptions and satisfaction toward an island of Taiwan, *Ocean Coast Manag.* 119 (2016) 58–67, <https://doi.org/10.1016/j.ocecoaman.2015.09.013>.
- [52] S.S. Jang, B. Bai, C. Hu, C.-M.E. Wu, Affect, travel motivation, and travel intention: a senior market, *J. Hospit. Tourism Res.* 33 (1) (2009) 51–73, <https://doi.org/10.1177/1096348008329666>.
- [53] F.E. Otoo, S.S. Kim, Analysis of studies on the travel motivations of senior tourists from 1980 to 2017: progress and future directions, *Curr. Issues Tourism* 23 (4) (2018) 393–417, <https://doi.org/10.1080/13683500.2018.1540560>.
- [54] Y. Chang, R.-J. Hou, K. Wang, A.P. Cui, C.-B. Zhang, Effects of intrinsic and extrinsic motivation on social loafing in online travel communities, *Comput. Hum. Behav.* 109 (2020), <https://doi.org/10.1016/j.chb.2020.106360>.
- [55] Y. Zhang, J. Li, C.-H. Liu, Y. Shen, G. Li, The effect of novelty on travel intention: the mediating effect of brand equity and travel motivation, *Manag. Decis.* 59 (6) (2021) 1271–1290, <https://doi.org/10.1108/md-09-2018-1055>.
- [56] S. Stolton, N. Dudley, B. Avcıoğlu Çoçalışkan, D. Hunter, K.-Z. Ivanić, E. Kanga, M. Kettunen, Y. Kumagai, N. Maxted, J. Senior, M. Wong, K. Keenleyside, D. Mulrooney, J. Waithaka, Values and benefits of protected areas, in: *Protected Area Governance and Management*, ANU Press, 2015, pp. 145–168. <https://press.anu.edu.au/publications/protected-areagovernance-and-management#tabanchor>.
- [57] E. Crespo-Cebada, C. Díaz-Caro, R. Robina-Ramírez, M.I. Sánchez-Hernández, Is biodiversity a relevant attribute for assessing natural parks? Evidence from cornalvo natural park in Spain, *Forests* 11 (4) (2020) 410, <https://doi.org/10.3390/f11040410>.
- [58] G.A. Rook, Regulation of the immune system by biodiversity from the natural environment: an ecosystem service essential the health, *Proc. Natl. Acad. Sci. USA* 110 (46) (2013), <https://doi.org/10.1073/pnas.1313731110>.
- [59] J.E. Gordon, R. Crofts, E. Díaz-Martínez, K.S. Woo, Enhancing the role of geoconservation in protected area management and nature conservation, *Geoh Heritage* 10 (2018) 191–203, <https://doi.org/10.1007/s12371-017-0240-5>.
- [60] R.R. Ramírez, P.R. Palos-Sánchez, Environmental firms' better attitude towards nature in the context of corporate compliance, *Sustainability* 10 (9) (2018) 3321, <https://doi.org/10.3390/su10093321>.
- [61] A. Jiricka-Pürner, Valeria Tadini, Boris Salak, Karolina Taczanowska, Andrzej Tucki, Giulio Senes, Do protected areas contribute to health and well-being? A cross-cultural comparison, *Int. J. Environ. Res. Public Health* 16 (2019), <https://doi.org/10.3390/ijerph16071172>.
- [62] A.E. Cheesbrough, Theresa Garvin, Candace I.J. Nykiforuk, Everyday wild: urban natural areas, health, and well-being, *Health Place* 56 (2019) 43–52, <https://doi.org/10.1016/j.envpol.2007.06.012>.
- [63] M. Kampa, E. Castanas, Human health effects of air pollution, *Environmental Pollution* 151 (2) (2008) 362–367, <https://doi.org/10.1016/j.envpol.2007.06.012>.
- [64] W. Mueller, James Milner, Miranda Loh, Sotiris Vardoulakis, Paul Wilkinson, Exposure to urban greenspace and pathways to respiratory health: an exploratory systematic review, *Sci. Total Environ.* (2022), <https://doi.org/10.1016/j.scitotenv.2022.154447>. Volume.
- [65] R. Aerts, Honnay Olivier, An Van Nieuwenhuysse, Biodiversity and human health: mechanisms and evidence of the positive health effects of diversity in nature and green spaces, *Br. Med. Bull.* 127 (1) (2018) 5–22, <https://doi.org/10.1093/bmb/ldy021>.
- [66] F. Romagosa, Physical health in green spaces: visitors' perceptions and activities in protected areas around Barcelona, *Journal of Outdoor Recreation and Tourism* 23 (2018) 26–32, <https://doi.org/10.1016/j.jort.2018.07.002>.
- [67] K. Pinckard, K.K. Baskin, K.I. Stanford, Effects of exercise to improve cardiovascular health, *Front. Cardiovasc. Med.* 6 (2019) 69, <https://doi.org/10.3389/fcvm.2019.00069>.
- [68] M.A. Elmagd, *Benefits, need and importance of daily exercise*, *International Journal of Physical Education, Sports and Health* 3 (5) (2016) 22–27.
- [69] M.F.F. Chong, H.X. Lim, B.W. Wong, Z.H. Chi, J.K. Inthujaa, F. Müller-Riemenschneider, K.S. Chia, Transiting out of full-time national service: a qualitative study of barriers and motivators of weight change in young adult men in Singapore, *Am. J. Men's Health* 16 (2) (2022), 15579883221074788, <https://doi.org/10.21203/rs.3.rs-108688/v1>.
- [70] R. Buxton, Amber L. Pearson, Claudia Allou, Kurt Frstrup, Wittemyer George, A synthesis of health benefits of natural sounds and their distribution in national parks, *Proc. Natl. Acad. Sci. USA* 118 (14) (2021), e201309711, <https://doi.org/10.1073/pnas.2013097118>.
- [71] R. Ravina-Ripoll, E. Galván-Vela, C.R.G. Popescu, E. Ahumada-Tello, Guest editorial: exploring happiness in the workplace as an essential theme for developing managers post-pandemic, *J. Manag. Dev.* 42 (6) (2023) 421–424, <https://doi.org/10.1108/JMD-07-2023-512>.
- [72] R. Ravina Ripoll, L.M. Romero-Rodríguez, E. Ahumada-Tello, Guest editorial: happiness management: key factors for sustainability and organizational communication in the age of Industry 4.0, *Corp. Govern.* 22 (3) (2022) 449–457, <https://doi.org/10.1108/CG-05-2022-576>.
- [73] A. Benassi, *Imagining the Memory of the Earth. Thinking Continental: Writing the Planet One Place at a Time*, vol. 76, 2017, <https://doi.org/10.2307/j.ctt1w6t6kf.9>.
- [74] R. Ravina-Ripoll, L. Tobar-Pesantez, J.A.L. Sanchez, Entrepreneur happiness as a portfolio of competitiveness and sustainability in the Covid-19 era, *Int. J. Entrepren.* 25 (2021) 1–3. Retrieved from, <https://www.proquest.com/scholarly-journals/entrepreneur-happiness-as-portfolio/docview/2563847577/se-2>.
- [75] R. Robina-Ramírez, A. Leal-Solís, J.A. Medina-Merodio, R. Estriegana-Valdehita, From satisfaction to happiness in the co-creation of value: the role of moral emotions in the Spanish tourism sector, *Qual. Quantity* 57 (4) (2023) 3783–3804, <https://doi.org/10.1007/s11135-022-01528-0>.
- [76] R. Robina-Ramírez, J.A. Medina-Merodio, Transforming students' environmental attitudes in schools through ex-ternal communities, *J. Clean. Prod.* 232 (2019) 629–638, <https://doi.org/10.1016/j.jclepro.2019.05.391>.
- [77] M.J. Sirgy, Toward a quality-of-life theory of leisure travel satisfaction, *J. Trav. Res.* 49 (2) (2010) 246–260, <https://doi.org/10.1177/0047287509337416>.
- [78] R. Robina Ramírez, M. Pulido Fernández, Religious experiences of travellers visiting the royal monastery of santa maría de Guadalupe (Spain), *Sustainability* 10 (6) (2018) 1890, <https://doi.org/10.3390/su10061890>.
- [79] U. Schirpke, R. Scolozzi, R. Da Re, M. Masiero, D. Marino, Recreational ecosystem services in protected areas: a survey of visitors to Natura 2000 sites in Italy, *Journal of Outdoor Recreation and Tourism* 21 (2018) 39–50, <https://doi.org/10.1016/j.jort.2018.01.003>.
- [80] A. Fleischer, A. Pizam, Tourism constraints among Israeli seniors, *Ann. Tourism Res.* 29 (1) (2002) 106–123, [https://doi.org/10.1016/s0160-7383\(01\)00026-3](https://doi.org/10.1016/s0160-7383(01)00026-3).
- [81] L. Horneman, R.W. Carter, S. Wei, H. Ruys, Profiling the senior traveler: an Australian perspective, *J. Trav. Res.* 41 (1) (2002) 23–37, <https://doi.org/10.1177/004728750204100104>.
- [82] L. Huang, H.-T. Tsai, The study of senior traveler behavior in Taiwan, *Tourism Manag.* 24 (5) (2003) 561–574, [https://doi.org/10.1016/s0261-5177\(03\)00008-6](https://doi.org/10.1016/s0261-5177(03)00008-6).
- [83] G. Nimrod, A. Rotem, Between relaxation and excitement: activities and benefits gained in retirees' tourism, *Int. J. Tourism Res.* 12 (1) (2010) 65–78, <https://doi.org/10.1002/jtr.739>.
- [84] M.C. Sellick, Discovery, connection, nostalgia: key travel motives within the senior market, *J. Trav. Tourism Market.* 17 (1) (2004) 55–72, https://doi.org/10.1300/j073v17n01_04.
- [85] S. Ryan Shoemaker, Segmentation of the senior pleasure travel market: 10 years later, *J. Trav. Res.* 39 (2000) 11–26, <https://doi.org/10.1177/004728758902700304>.
- [86] A.J. Halliday, M.L. Kern, D.K. Garrett, D.A. Turnbull, The student voice in well-being: a case study of participatory action research in positive education, *Educ. Action Res.* 27 (2) (2019) 173–196, <https://doi.org/10.1080/09650792.2018.1436079>.
- [87] A. Schröder, T. Widmann, Demographic change and its impact on the travel industry: oldies—nothing but goldies? Trends and issues in global tourism (2007) 3–17, https://doi.org/10.1007/978-3-540-70905-3_1.
- [88] Z. Zimmer, R.E. Braley, M.S. y Searle, Weather to go and where to go: identification of important influences on senior's decisions to travel, *J. Trav. Res.* 33 (1995) 3–10, <https://doi.org/10.1177/004728759503300302>.

- [89] J.F. Hair Jr., L.M. Matthews, R.L. Matthews, M. Sarstedt, PLS-SEM or CB-SEM: updated guidelines on which method to use, *International Journal of Multivariate Data Analysis* 1 (2) (2017) 107–123, <https://doi.org/10.1504/ijmda.2017.10008574>.
- [90] P.B. Lowry, J. Gaskin, Partial least squares (PLS) structural equation modeling (SEM) for building and testing behavioral causal theory: when to choose it and how to use it, *IEEE transactions on professional communication* 57 (2) (2014) 123–146, <https://doi.org/10.1109/tpc.2014.2312452>.
- [91] W. Reinartz, M. Haenlein, J. Henseler, An empirical comparison of the efficacy of covariance-based and variance-based SEM, *Int. J. Res. Market.* 26 (4) (2009) 332–344, <https://doi.org/10.1016/j.ijresmar.2009.08.001>.
- [92] Z. Jannoo, B.W. Yap, N. Auchoybur, M.A. Lazim, The effect of nonnormality on CB-SEM and PLS-SEM path estimates, *International Journal of Mathematical and Computational Sciences* 8 (2) (2014) 285–291, <https://doi.org/10.3990/2.357>.
- [93] Edward G. Carmines, Richard A. Zeller, *Reliability and Validity Assessment*, vol. 17, Sage publications, 1979, <https://doi.org/10.4135/9781412985642>.
- [94] J.F. Hair, C.M. Ringle, M. Sarstedt, PLS-SEM: indeed a silver bullet, *J. Market. Theor. Pract.* 19 (2) (2011) 139–152, <https://doi.org/10.2753/mtp1069-6679190202>.
- [95] Claes Fornell, David F. Larcker, Structural equation models with unobservable variables and measurement error: algebra and statistics, *J. Market. Res.* (1981) 382–388, <https://doi.org/10.1177/002224378101800313>.
- [96] J. Henseler, C.M. Ringle, M. Sarstedt, A new criterion for assessing discriminant validity in variance-based structural equation modeling, *J. Acad. Market. Sci.* 43 (1) (2015) 115–135, <https://doi.org/10.1007/s11747-014-0403-8>.
- [97] J. Henseler, C.M. Ringle, M. Sarstedt, Testing measurement invariance of composites using partial least squares, *Int. Market. Rev.* (2016), <https://doi.org/10.1108/imr-09-2014-0304>.
- [98] G. Dash, J. Paul, CB-SEM vs PLS-SEM methods for research in social sciences and technology forecasting, *Technol. Forecast. Soc. Change* 173 (2021), <https://doi.org/10.1016/j.techfore.2021.121092>.
- [99] G. Cepeda-Carrion, J.G. Cegarra-Navarro, V. Cillo, Tips to use partial least squares structural equation modelling (PLS-SEM) in knowledge management, *J. Knowl. Manag.* 23 (1) (2018) 67–89, <https://doi.org/10.1108/jkm-05-2018-0322>.
- [100] W.W. Chin, The partial least squares approach to structural equation modeling, *Modern Methods for Business Research* 295 (2) (1998) 295–336.
- [101] A. Diekmann, S. McCabe, C.C. Ferreira, Social tourism: research advances, but stasis in policy. Bridging the divide, *J. Policy Res. Tour. Leis. Events* 10 (3) (2018) 181–188, <https://doi.org/10.1080/19407963.2018.1490859>.
- [102] G.P. Chrousos, Stress and disorders of the stress system, *Nat. Rev. Endocrinol.* 5 (7) (2009) 374–381, <https://doi.org/10.1038/nrendo.2009.106>.
- [103] T. Wyatt, S.B. Oswalt, Comparing mental health issues among undergraduate and graduate students, *Am. J. Health Educ.* 44 (2) (2013) 96–107, <https://doi.org/10.1080/19325037.2013.764248>.
- [104] V.W.S. Tung, J.B. Ritchie, Exploring the essence of memorable tourism experiences, *Ann. Tourism Res.* 38 (4) (2011) 1367–1386, <https://doi.org/10.1016/j.annals.2011.03.009>.
- [105] L. Moutinho, Role of budgeting in planning, implementing, and monitoring hotel marketing strategies, *Int. J. Hospit. Manag.* 6 (1) (1987) 15–22, [https://doi.org/10.1016/0278-4319\(87\)90005-3](https://doi.org/10.1016/0278-4319(87)90005-3).
- [106] F. Romagosa, P.F.J. Eagles, C.J. Lemieux, From the inside out to the outside in: exploring the role of parks and protected areas as providers of human health and well-being, *Journal of Outdoor Recreation and Tourism* 10 (2015) 70–77, <https://doi.org/10.1016/j.jort.2015.06.009>. ISSN 2213-0780.
- [107] J. Terraube, A. Fernández-Llamazares, M. Mar Cabeza, The role of protected areas in supporting human health: a call to broaden the assessment of conservation outcomes, *Curr. Opin. Environ. Sustain.* 25 (2017) 50–58, <https://doi.org/10.1016/j.cosust.2017.08.005>.
- [108] G. Moore, J. Hopkins, *Urban Parks and Protected Areas: on the Front Lines of a Pandemic*, vol. 27, PARKS, 2021, <https://doi.org/10.2305/iucn.ch.2021.parks-27-sigm.en>. Special Issue.