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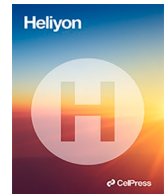
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Passion in hiking guides affects their group management skills and functional psychobiosocial experiences

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ABSTRACT

Using the individual zones of optimal functioning model as a conceptual framework, the purpose of this study was to examine the interplay between passion, perceived group management skills, and functional emotion-related (psychobiosocial) experiences in hiking guides. The participants were 60 Italian hiking guides, 47 men and 13 women, aged 32–74 years ($M = 57.25$, $SD = 10.49$). They were asked to fill in an online questionnaire containing measures of harmonious and obsessive passion, perceived group management skills, and psychobiosocial experiences. Path analysis results showed positive indirect effects of both harmonious passion and obsessive passion on psychobiosocial experiences via group management skills. Additional results from moderated moderation suggest that high levels of obsessive passion, combined with low levels of both harmonious passion and perceived group management skills, are associated with lower intensity levels of psychobiosocial experiences. The findings contribute to increasing our understanding of the overall experience of hiking guides, and the important role they play in motivating people to engage in physical activity in a natural environment.

1. Introduction

Hiking has become increasingly popular over the last decades due to a progressive interest in physical activity in a natural environment; "It only requires a good pair of hiking boots or shoes and a natural area" [1] (p. 6). Unlike trekking which can last more than a day, hiking usually lasts from a few hours to a full day and is less adventurous and demanding. It is often practiced as a leisure activity [2], and it takes place on easy terrains and trails, especially in the countryside, hills, forests, and parks; the mileage and elevation gain are not very high, and the backpack is quite light. Natural environments can vary a lot, but the difficulties, risks, and dangers are not usually high. Hiking is practiced either alone or in group, in the latter case as part of excursions led by one or more expert guides.

Hiking guides play a crucial role in the world of hiking, enabling novice and expert hikers to come into direct contact with the natural environment. With the growing popularity of hiking, the need for experienced guides has become increasingly important to

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ensure a safe and enjoyable hiking experience for participants. With their knowledge of the terrain, weather conditions, and potential hazards, hiking guides take responsibility for ensuring the safety of the group. They also play a key role in educating hikers about the importance of preserving and protecting the natural environment. In essence, hiking guides not only serve as expert guides, but also contribute to the sustainability and enjoyment of hiking as a popular recreational activity [1,3,4].

In particular, the following three primary aims have been identified as part of the outdoor guides' leadership: ensuring safety, ensuring the protection and preservation of the natural environment, and enhancing the quality of outdoor experiences in participants [3]. According to Cohen [4], tourist guides can guarantee pleasant experiences for participants (instrumental function), promote cohesion (social function), facilitate interactions in the context (interactional function), and facilitate communication (communicative function). Shooter et al. [5] underlined the importance of trust that participants should have in the outdoor leader, and observed how participants identified honesty, consistency, and respect as influential aspects in developing trust. An effective outdoor leader should be honest, knowledgeable about the itinerary, be calm in a crisis, communicate effectively, and show respect. Beyond the technical knowledge (e.g., type of path, cartography, meteorology), the preparation of outdoor leaders should include group management skills to ensure pleasurable emotional experiences for all participants.

People who engage in physical activity in natural environments usually do so because they love it. Hiking guides love hills and mountains, display a strong interest in their activity, and spend a lot of time in organizing and leading excursions. They are usually highly motivated toward accompanying participants through trails, and, in Italy, they frequently do it as volunteers. The motivational processes of hiking guides can be understood in light of the dualistic model of passion also applied in sport and physical exercise [6–9]. Passion is defined as a strong inclination or desire toward a self-defining activity that one likes (or even loves), highly values, and in which one invests time and energy. According to the dualistic model, there are two types of passion, harmonious passion and obsessive passion [7,10]. Harmonious passion entails an active, autonomous, balanced, flexible, and dynamic engagement in one's favorite activity. The person remains in control of their passion, which is expected to lead to more adaptive outcomes than obsessive passion in terms of affective and cognitive functioning. Obsessive passion, on the other hand, is characterized by a passive, conflicted, and inflexible type of engagement in the activity, as if the person is controlled by their passion. This type of passion typically leads to less adaptive outcomes, including ill-advised persistence and emotional suffering.

The dualistic model of passion has gained research support in different contexts and populations, including athletes and coaches (for a review, see Ref. [10]). However, the different implications of harmonious and obsessive passion are still conflicting. Research findings, indeed, support the notion of a partially polarized conception of passion, and the view of obsessive passion as more complex and not always maladaptive. In the sport domain, for example, Vallerand et al. [11] found obsessive passion to be a positive predictor of ambitious goal setting, to positively contribute to the development of competence and task mastery, and to underlie good performance. In the work domain, Omorede et al. [12] found a positive linear relationship between project management leaders' competence and obsessive passion. Challenging goals were attained to a greater extent when the project leaders reported high obsessive passion.

These research findings may also fit with the two-dimensional view of passion proposed by Szabo and colleagues [13,14]. This view suggests that passion can be understood and classified according to the co-occurrence of the two types of passion (i.e., harmonious and obsessive). The combination of high harmonious passion (a pleasurable engagement in the activity) and high obsessive passion (an intense urge to engage in the activity) indicates intense passion, a strong attraction to the activity. On the other hand, low harmonious passion combined with low obsessive passion indicates an absence of passion, and the person may not feel connected or committed to the task. Low harmonious passion paired with high obsessive passion reflects obligatory or pressurized behavior, in which the person feels compelled to engage in the task by external factors rather than experiencing genuine enjoyment and being driven by intrinsic motivation. Finally, high harmonious passion combined with low obsessive passion reflects affinity, devotion, and commitment. According to the two-dimensional view, these forms of passion are not fixed, but are dynamic traits that continuously interact with each other, varying in proportion and intensity in function of different situations and contexts. Discovery passion, as an inner motivation to explore and learn, was also assumed as a third dimension that lies between harmonious passion and obsessive passion [15, 16]. The coexistence of the three forms of passion can be present in leisure activities; one serves the enjoyment of the activity (harmonious passion), the other the reward of exploration and learning (discovery passion), and the third the discipline to achieve specific goals (obsessive passion).

Passion and emotions are closely related even though they are distinct constructs [17]. According to the dualistic model [10], passion serves as an amplifier of the intensity of emotions. When an individual is passionate about an activity, they experience high intensity levels of emotions. Harmonious passion is predicted to trigger pleasant emotional experiences, whereas obsessive passion is expected to lead to lower intensity levels of pleasant emotions and higher levels of unpleasant emotions. Coppin and Sander [18] define emotion as a complex phenomenon during which several components (expression, action tendency, bodily reaction, feeling, and appraisal) are activated by the evaluation of an event considered as relevant for an individual. A broad construct that involves emotion as well as other related experiences is the concept of psychobiosocial states, proposed within the individual zones of optimal functioning (IZOF) model [19–21], a leading theoretical framework widely applied in sport and physical activity [22]. In essence, psychobiosocial states are defined as the constellation of subjective experiences that result from the interaction with the environment and reflect the perceptions of one's ability (or inability) to manage situational demands and exert functional or dysfunctional effects on individual performance [20,21]. The primary modality of psychobiosocial states is the emotional experience, which can be pleasant or unpleasant. Other modalities involve cognitive, motivational, bodily-somatic, motor-behavioral, operational, and communicative aspects (for a full discussion, see Refs. [23,24]). There are instruments assessing these experiences, with a recent measure developed to assess other related modalities, such as assertiveness, confidence, and social support (see Ref. [25]).

In an extensive review of research based on the IZOF model in sport and physical activity settings, twenty-five studies were related

to communication or interpersonal relationships, coaching, and performance optimization [22]. Organizational and relational skills (i. e., group management skills) are at the core of the performance of hiking guides and are expected to be related to the two types of passion and psychobiosocial experiences. Therefore, the overall purpose of the present study was to examine the relationships between these variables. Understanding how these variables interact with each other can have relevant theoretical implications and provide useful information for the preparation of hiking guides.

1.1. Study purpose

The purpose of the present study was to examine the relationships between passion, perceived group management skills, and functional psychobiosocial experiences in hiking guides. We hypothesized that (a) harmonious passion would be positively related to group management skills and psychobiosocial experiences; and (b) obsessive passion would be positively associated with group management skills and negatively linked to psychobiosocial experiences (Hypothesis 1). We also expected to find a positive indirect link between harmonious passion and psychobiosocial experiences via group management skills (Hypothesis 2). No specific hypothesis was forwarded on the indirect link with obsessive passion because of the expected positive link of this variable with group management skills and the negative link with psychobiosocial experiences.

2. Materials and methods

2.1. Participants

We involved in the study a sample of 60 hiking guides belonging to two Italian hiking associations (Italian Alpine Club, Passo-Barbasso) and mostly living in Emilia-Romagna, a region in Northeastern Italy. The first author, who deals with hiking organizations, contacted the representatives of the two hiking associations and explained to them the purpose of the study. After this, participants were recruited via email, telephone calls, and snowball sampling. The sample consisted of 13 women and 47 men aged 32–74 years ($M = 57.25$, $SD = 10.49$). Twenty-eight participants (6 women and 22 men) had attended specific training and were qualified guides. The guides had between 1 and 45 years of hiking guiding experience ($M = 10.13$, $SD = 8.68$), mainly with groups with less than 15 participants and on low difficulty excursions, but almost half of the guides accompanied groups also in routes with high difficulty, and a third of them were equipped in snow-covered paths.

2.2. Measures

2.2.1. Passion

Based on the dualistic model of passion, we used the Passion Scale [7,26] to measure harmonious passion (6 items; e.g., “This activity is in harmony with the other activities in my life”) and obsessive passion (6 items; “I have almost an obsessive feeling for this activity”), which are deemed to be predictive of adaptive and maladaptive outcomes, respectively. Items were rated on a 5-point scale ranging from 0 (“do not agree at all”) to 4 (“completely agree”). This scale demonstrated good validity and reliability across cultures, gender, and a wide variety of activities (e.g., leisure, sport, social, work, education [7,10,26,27]). This scale, originally devised in French and then translated into English, was translated and adapted to the Italian language following back-translation procedures [28].

2.2.2. Perceived group management skills

Following an extensive literature search (e.g., Refs. [2,3]), and for the purposes of this study, we developed a questionnaire to assess perceived group management skills of hiking guides. To examine the validity and suitability of the questionnaire, four highly experienced guides, responsible for the education and training of new guides, were involved in a focus group led by two of the authors. One of them had a vast hiking and trekking experience, which served as background knowledge used for an in-depth discussion of the topic, providing a great level of understanding of guides’ experiences. In particular, she led the discussion by encouraging all participants to contribute their views and experiences, eliciting spontaneous insights, ensuring that everyone had a chance to express their views, asking follow-up questions to clarify and explore points of view or experiences, taking detailed notes during the discussion to capture important key themes, and summarizing the main points. The main areas identified after extensive discussion of the skills hiking guides should possess were interpersonal and organizational. The resulting questionnaire contained 15 items to assess both relational skills (e.g., “Stimulate encouragement and support among the participants”) and organizational skills (e.g., “Being able to respect what was planned in terms of objectives and times”). The hiking guides were asked to rate their perceived management skills on a 5-point scale ranging from 0 (“not at all”) to 4 (“very much”). All experts agreed that the items identified provided a comprehensive evaluation of the guides’ relational and organizational skills.

2.2.3. Psychobiosocial experiences

Psychobiosocial experiences were assessed using the Psychobiosocial Experience Semantic Differential scale in sport (PESD-Sport [25]), which consists of 30 bipolar items representing 10 modalities with 3 items each. In particular, the PESD-Sport comprises (a) psychological modalities—emotion u/p (unpleasant/pleasant), confidence, anxiety, assertiveness, and cognitive; (b) bodily modalities—bodily-somatic and motor-behavioral; and (c) social modalities—operational, communicative, and social support. In the semantic differential, an adjective and its antonym form the scale anchors of each item (e.g., “unconfident–confident”,

“submissive–fighting spirit”). Dysfunctional adjectives for performance are placed on the left side of a Likert-type scale, while functional antonyms for performance are placed on the right side. Positive scores on all modalities were reported by athletes to describe how they usually felt before an important competition [25], thus indicating that the scale mostly reflects functional experiences.

The hiking guides were asked to think about how they usually feel before embarking on an important and demanding hike, to choose one functional or dysfunctional descriptor for each bipolar item, and to rate the chosen descriptor on the bipolar Likert-type scale ranging from 4 (very much) to 0 (neither ... nor) on the “dysfunctional” side and from 0 (neither ... nor) to 4 (very much) on the “functional” side. Ratings on the dysfunctional side are then converted into negative scores. Thus, the score of an item can range from –4 to 4, with 0 indicating no effect. A total score is derived by adding the scores of the individual items. Factorial, construct, convergent, discriminant, and nomological validity of the measure was reported in a sample of Italian athletes [25].

2.3. Procedure

The study was carried out according to the ethical principles of the Declaration of Helsinki and following ethical approval by the ethics committee of “G. d’Annunzio” University of Chieti-Pescara (No.19, 09/09/2021). The guides were informed about the general aim of the study and the completely voluntary and anonymous nature of participation. Participants who agreed to participate in the study were sent a link to complete an online questionnaire containing the informed consent, demographic questions, and the measures of passion, perceived group management skills, and psychobiosocial experiences. The link was made available through the hiking associations or other hiking guides who had already joined the survey. The guides could decide when to complete the online survey, which required about 20 min. Participants were asked to think about their feelings, experiences, and responsibilities when involved in their role as hiking guides. The online system was set so that all items had to be answered and only one choice could be made, thus, there were no missing values. Dropout from the study was not observed, so all individuals who opted to participate completed the survey.

2.4. Data analysis

Prior to the main analysis, the dataset was screened for potential univariate or multivariate outliers on the mean total scores of the variables (i.e., Harmonious passion, Obsessive passion, Perceived group management skills, and Psychobiosocial experiences). Assumptions of normality and multicollinearity were also checked [29]. Descriptive statistics, Pearson product-moment correlation coefficients, Cronbach’s alpha (α) values, and McDonald’s omega (ω) values were computed for the measures using SPSS (version 27). Although it has limitations, Cronbach’s α is a widely used measure of internal consistency, while McDonald’s ω is considered a more suitable alternative for assessing reliability [30].

Path analysis was performed in Mplus version 8.5 [31] to test the hypothesized relationships between variables. Several authors (e.g., Refs. [29,32]) suggest the rule of thumb to include at least ten participants per parameter to be estimated. Five parameters had to be estimated in the present study, so the current sample size was deemed appropriate. To examine indirect effects, we employed the bias-corrected bootstrap method based on 10,000 resamples and 95% confidence intervals (CIs) around the standardized estimate (β). The indirect effect is assumed significant when the CI for the indirect effect does not include zero [33].

3. Results

An examination of boxplots and Mahalanobis’ distances ($p < 0.01$) did not provide evidence for univariate or multivariate outliers. Assumptions of normality and multicollinearity were met, and reliability values were good for all measures (see Table 1). Hiking guides reported higher mean scores for harmonious passion and lower mean scores for obsessive passion than the midrange, indicating that participants’ passion was mainly harmonious. It is worth noting that mean scores for obsessive passion were substantially lower than those reported in samples of exercisers from nine countries [14]. Mean scores of group management skills and psychobiosocial experiences were also above the midrange, meaning that participants perceived possessing good management skills which were accompanied by functional psychobiosocial experiences.

In line with Hypothesis 1, the results indicated correlations between variables in the expected direction, that is harmonious passion was positively associated with group management skills and psychobiosocial experiences. The correlation between obsessive passion and psychobiosocial experiences was not significant. Path analysis results are shown in Fig. 1. All the paths linking the variables were significant and positive, except for the direct link between obsessive passion and psychobiosocial experiences which was significant and negative (these results support Hypothesis 1). The relationships proposed in the model explained 27.3% of the variance in group

Table 1

Descriptive statistics, Pearson product-moment correlation coefficients, Cronbach’s alpha (α) values, and McDonald’s omega (ω) values ($N = 60$).

Variables	<i>M</i>	<i>SD</i>	Skewness	Kurtosis	1	2	3	α	ω
1. Harmonious passion	2.647	0.532	0.009	–0.387	–			0.780	0.753
2. Obsessive passion	0.911	0.686	0.794	0.043	0.170	–		0.810	0.817
3. Group management skills	2.602	0.576	0.320	–0.543	0.470 [§]	0.305*	–	0.936	0.936
4. Psychobiosocial experiences	2.043	0.692	–0.855	0.916	0.563 [§]	–0.054	0.471 [§]	0.949	0.948

Note. Correlation *low, [§]moderate [34].

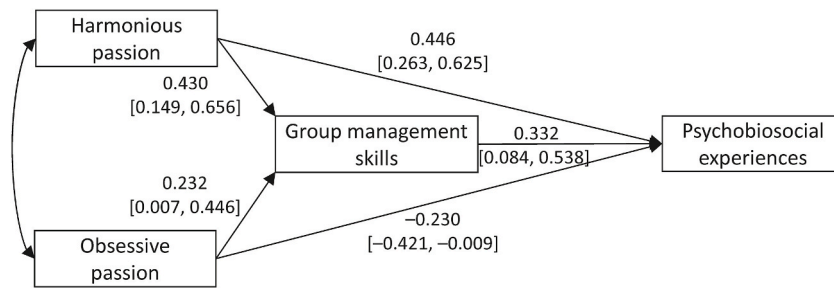


Fig. 1. Path analysis results. All standardized values (β) are significant at $p < 0.05$ (95% CI are in square brackets).

management skills, and 42.0% of the variance in psychobiosocial experiences.

As predicted (Hypothesis 2), the indirect link between harmonious passion and psychobiosocial experiences via group management skills was significant and positive ($\beta = 0.143$, 95% CI = 0.048, 0.286). The indirect link between obsessive passion and psychobiosocial experiences via group management skills was also significant and positive ($\beta = 0.077$, 95% CI = 0.005, 0.218); however, the direct path from obsessive passion to psychobiosocial experiences was negative (see Fig. 1).

To further examine the latter path, we plotted the interactive effects of harmonious passion and obsessive passion as a function of group management skills. The plot was obtained from the results of a moderated moderation using Model 3 of the PROCESS macro v. 4.1 for SPSS [28]. Obsessive passion was entered as independent variable in the prediction of psychobiosocial experiences, while group management skills and harmonious passion were entered as moderators. Following mean centering of the independent variable and the moderators, one standard deviation below and above the mean scores of harmonious passion, obsessive passion, and group management skills served as a reference to derive the interactive effects which are depicted in Fig. 2. Findings suggest that high levels of obsessive passion combined with low levels of both harmonious passion and group management skills are associated with low intensity levels of psychobiosocial experiences. This hypothesis is also supported by the increase in the negative correlation between obsessive passion and psychobiosocial experiences found when comparing the entire sample ($r = -0.054$) with a subsample of participants ($n = 20$, $r = -0.464$, moderate correlation [34]), characterized by lower levels of group management skills and harmonious passion than their colleagues.

4. Discussion

Drawing on the dualistic model of passion [6–10], the purpose of this study was to examine the interplay between passion (harmonious and obsessive), perceived group management skills, and psychobiosocial experiences in hiking guides. We also examined possible indirect links between passion and psychobiosocial experiences via group management skills. The sample comprised 43 men and 13 women, which underscores the underrepresentation of women in outdoor leadership positions as found also in previous studies [35,36].

The data showed that hiking guides reported relatively high values of harmonious passion, perceived group management skills, and psychobiosocial experiences, and low values of obsessive passion. According to Hypothesis 1, positive moderate correlations were

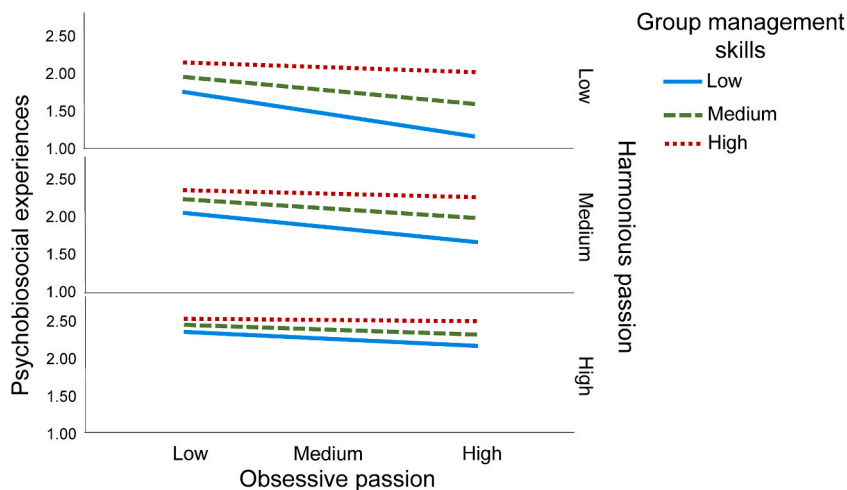


Fig. 2. Relationships between harmonious passion, obsessive passion, group management skills, and psychobiosocial experiences. “Low” indicates -1 SD below and “High” indicates $+1$ SD above the mean scores after mean centering.

found between harmonious passion, group management skills, and psychobiosocial experiences, while positive low correlations were shown between obsessive passion and group management skills. On the other hand, obsessive passion was not related to psychobiosocial experiences. These findings indicate that the hiking guides' overall experience is positive and functional for the role they play.

In a meta-analytical review of the relationship between the two distinct types of passion and different aspects of intrapersonal outcomes (e.g., affect, motivation, performance goals), Curran et al. [37] found that both harmonious and obsessive passion were energizing and could have adaptive consequences. Most studies showed a positive relationship between harmonious passion and positive intrapersonal responses. Interestingly, previous research examining the role of leaders suggests that, in certain environmental situations, obsessive passion can be beneficial. For example, Patel et al. [38] found that project leaders' obsessive passion resulted in effective performance. Moreover, this effect was reinforced in dynamic environments characterized by unpredictability and rapid changes in the situation. Changing conditions require leaders to be able to adapt rapidly, spending significant personal energy in the face of new and different demands from the environment or specific group situations, while maintaining a strong goal commitment. In addition, Omorede et al. [12] suggested that project management leaders' obsessive passion improves motivation and is a key mechanism in contexts where goals are challenging, highly difficult, and complex. In difficult situations, where individuals need to actively focus, persist, and make the most of their skills, obsessive passion could be a strong motivating factor.

These contentions also align with the two-dimensional model of passion [15,16], which implies co-occurrence of harmonious and obsessive types of passion, as well as discovery passion that lies between them. Hiking guides act in a dynamic environment which may be unpredictable at times, such as an abrupt change in the weather conditions. Rapid and unexpected environmental changes can determine sudden and intense physical and emotional reactions in participants [39]. Obsessive passion can, therefore, help guides anticipate potentially dangerous environmental changes and effectively deal with dynamic and complex situations in natural environments. In relation to hiking guides' discovery passion, it can be hypothesized that their intrinsic motivation to explore and acquire new knowledge and skills plays a significant role in cultivating their harmonious passion, which, in turn, would foster their overall involvement and commitment to the activity. The desire for new discoveries might not only help improve their skills, but also make them more proficient in their role as guides. As a result, hiking guides might be better equipped to promote participants' exploration and enjoyment of nature while stimulating curiosity, adaptability, environmental awareness, and facilitating transformative experiences.

The relationships between passion and psychobiosocial experiences found in our study are in line with the results of previous studies based on the dualistic model of passion, indicating adaptive and functional effects of harmonious passion on the different components of an individual experience as considered in the IZOF model. In a recent review in sport and exercise settings, Vallerand and Verner-Filion [40] reported that harmonious passion entails cognitive (concentration), motivational (task-oriented coping), motor-behavioral (higher levels of performance), bodily-somatic (increase in energy following activity engagement) adaptive processes and outcomes. Specifically referring to emotional aspects, past research showed that harmonious passion is associated with pleasant emotional experiences, while obsessive passion is linked with a decrease in pleasant emotions or an increase in unpleasant emotions [10,40–42]. In particular, hiking guides are highly passionate about activities that take place in nature; the bond with nature triggers pleasant emotions. Research shows that the more connected one feels with nature, the greater the positive effects on emotions [43].

As group leaders, hiking guides should be able to manage specific skills, such as structuring the excursion, being kind and attentive, providing effective verbal and non-verbal communication and instructions, and promoting cohesion in the group to guarantee that the participants will have a pleasant experience [4]. The results of the current study support these contentions. Path analysis showed a positive indirect effect from harmonious passion to psychobiosocial experiences via group management skills (Hypothesis 2). The indirect effect of obsessive passion on psychobiosocial experiences via group management skills was also positive, although the direct path from obsessive passion to psychobiosocial experiences was negative. Interestingly, the present findings suggest that psychobiosocial experiences are impaired only when both harmonious passion and perceived management skills are low and obsessive passion is high. On the other hand, high levels of perceived management skills seem to buffer the potential negative effects of obsessive passion on psychobiosocial experiences. These results underline the importance of a specific training on management skills to enable hiking guides to acquire and improve both organizational skills and relational competences. Organizational skills of hiking guides imply the ability to plan and adjust schedules (e.g., walking pace and breaks) based on the characteristics, skills, and aptitudes of the participants, as well as in function of environmental changes and constraints (e.g., meteorological conditions, terrain asperities, and barriers). Relational competencies involve the ability to communicate effectively, stimulate positive interaction between participants, share decisions, and prevent and resolve conflicts within the group.

4.1. Conclusions and practical implications

To our knowledge, most of the literature concerning outdoor leadership has been limited to examining adventure activity guiding (e.g., wilderness trekking, rock climbing), which is characterized by inherent significant levels of risk and uncertainty, focusing on emotional and motivational aspects related to potential sources of stress [35,44,45]. Even though typically there are fewer potential sources of stress in hiking than in adventure activities, sometimes hiking may present similar risks and dangers due to the environment (weather conditions, terrain, and wildlife) or to some characteristics of the participants and outdoor leaders (lack of competence, poor decision-making skills, lack of judgment [3]). We therefore assume that the findings of the present study extend to adventure activities, although future research is needed to test this hypothesis. Both hiking and adventure activity guides usually deal with participants they do not know well and who may possess different motor abilities and physical training levels. Moreover, in every environment and

situation, guiding is an emotional, body-oriented, and multi-role interactive activity, which requires multiple skills and social abilities, particularly in natural settings [39]. Understanding motivational processes and emotional (psychobiosocial) experiences of hiking and adventure activity guides is therefore important to increase their own well-being and positive outcomes resulting from their work. As Houge MacKenzie and Kerr [44] pointed out, carrying out psychological research to examine these issues can help foster guides' well-being, as well as reduce possible negative outcomes (e.g., burnout, turnover, poor service quality, and risk management).

From an applied perspective, the findings of the present study support practical recommendations for the training and development of passionate hiking guides, specifically focusing on enhancing organizational skills and cultivating relational competencies. Organizational skills encompass the capacity to plan and adapt schedules, taking into account internal factors such as characteristics, skills, and aptitudes of participants, as well as external factors like weather conditions and challenging terrain. Training programs should prioritize the development of such organizational skills to enable guides to navigate and adjust effectively to changing circumstances during hiking trips. In addition, effective communication and the ability to foster positive interactions among participants are paramount. Relational competencies are needed to foster engagement, promote teamwork, involve participants in decision-making, and handle group conflicts. Training should encompass these competencies, equipping guides with the essential skills needed to establish supportive and harmonious group dynamics. Well-trained guides proficient in these areas can accurately meet the needs and capabilities of participants, thereby ensuring safe, well-organized, and enjoyable hiking experiences.

4.2. Limitations and future research directions

The assessment of passion and psychobiosocial experiences, together with the relational and organizational skills derived from a focus group with experts, enabled us to examine some important features of the interplay between specific dispositions, role, and experience of hiking guides. Study findings, therefore, extend the knowledge to outdoor leadership in increasingly widespread activities in the natural environment that involve people of very different ages, abilities, and experience.

Notwithstanding the study's contribution, a limitation of this study is the relatively small sample size. A larger sample size and a proportionate number of female and male participants would ensure more reliable results and the possibility of examining potential gender differences in the study variables. However, it should be considered that the organized activity of guided hiking in Italy is mostly carried out by a limited number of non-professional passionate volunteers. Another study limitation is the correlational design adopted, which does not allow us to provide evidence on causality. Future longitudinal studies collecting data at different time-points can be used to better examine the dynamic relations between psychological constructs (such as passion and psychobiosocial experiences) and the reciprocal effects between psychological constructs and behaviors (i.e., management skills). Additional research can also shed light on the knowledge and skills hiking guides may need to acquire to effectively perform their role. This knowledge can derive from multiple sources, such as hiking participants and guide supervisors, together with hiking guide-centered retrospective measures and the implementation of intensive experience sampling assessment. Finally, research should further investigate the positive effects on health and well-being on an increasing number of participants involved in activities in the natural environment.

Author contribution statement

Mabel Morsiani: Conceived and designed the experiments; Performed the experiments; Wrote the paper.
 Claudio Robazza: Conceived and designed the experiments; Analyzed and interpreted the data; Wrote the paper.
 Massimiliano Di Liborio: Conceived and designed the experiments; Performed the experiments; Wrote the paper.
 Montse C. Ruiz: Conceived and designed the experiments; Analyzed and interpreted the data; Wrote the paper.
 Laura Bortoli: Conceived and designed the experiments; Performed the experiments; Wrote the paper.

Data availability statement

Data will be made available on request.

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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