

Sport mega-events, volunteer motivation, and self-assessment: reasons and expectations for participating in the Rio 2016 Olympic Games

MÁRIO COELHO TEIXEIRA¹, TELMA FRADE BANZA², NUNO CASTANHEIRA ALMEIDA³, ANDRÉ DIONÍSIO SESINANDO^{4*}

^{1,2,4}Sport and Health Department, University of Évora, PORTUGAL

¹Center for Advanced Studies in Management and Economics (CEFAGE), University of Évora, PORTUGAL

³School of Tourism and Maritime Technology, Polytechnic of Leiria, PORTUGAL

^{3,4}Centre for Tourism Research, Development and Innovation (CiTUR), PORTUGAL

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Abstract

Background: Sport management research is currently extensive and multidisciplinary, allowing a wide scientific knowledge about its multiple areas of intervention within the sport sciences. One of the key areas of research has focused on understanding the management of sporting events, particularly large-scale events, and their sporting, economic and social impacts. In the last decade, research has also been focusing on the study of volunteers involved in global sport mega-events. **Approach:** The main objective of this study focuses on in-depth knowledge about the satisfaction, expectations and motivations of volunteers involved in the organization of the 2016 Rio de Janeiro Olympic Games from a self-perception perspective, while identifying the socio-demographic profile and comparing results according to the variables of the analysis model. **Methods:** This research followed a quantitative-descriptive approach, using primary data collection through a semi-structured questionnaire survey. The data obtained were subsequently analysed and compared using descriptive and inferential statistical methods and techniques. In a universe of 25 241 volunteers, a total of 828 validated answers were obtained after verification of the questionnaires. **Results:** According to the survey, there was a prevalence of volunteers living in the organising country (90.1%), mostly female (53.7%). The most representative age groups were 16-25 years (38.6%), followed by the 26-35 age group (24.8%). Most volunteers were single (66.4%) and held a bachelor's degree (68.0%). The volunteers highlighted mainly the feeling of pleasure (20.0%), improvement of personal and professional curriculum (17.0%), passion for the Olympic Games (16.8%) and passion for sport (15.6%) as the main reasons and motivations for their involvement as volunteers in the event. The group comparison found some statistically significant gender differences, namely regarding the perceptions of "Recognition and/or rewards received", "Making professional contacts", "The tasks carried out allowed me to show my worth" and "Positive Experience". **Conclusions:** Participation as a volunteer in the world's most important sport mega-event was perceived as being positive, a feeling expressed by different motivations and levels of satisfaction regarding the value and benefits provided by this involvement. This is proven when 92.0% of the volunteers replied that they would participate in a similar experience again.

Keywords: sport management, sports development, sporting events, sporting experience, olympics, motivations and expectations

Introduction

Scientific research in the field of sports science is now wide and of unquestionable relevance, and the last decades have demonstrated the quality of several studies that contribute to a deep multidisciplinary knowledge in its various areas of intervention (Teixeira, 2009; Skinner & Engelberg, 2017; Theodorakis et al., 2019; Annear et al., 2019; Hills et al., 2019; Picamilho et al., 2021; Potop et al., 2022; Sesinando et al., 2023; Mestre et al., 2023).

However, the sport phenomenon has grown exponentially throughout the world, requiring a deeper understanding and study (Szczepaniak, 2020; Czupich, 2020; Szatkowski, 2022), not only in relation to the very structure and role of sport in modern societies (Dichter et al., 2019), but mainly at the level of sport organisations (Figueira & Teixeira, 2021; Camarada et al., 2021; Sesinando et al., 2022;).

In this field of scientific knowledge in particular, sport management research has contributed much through its ability to find answers to various questions about the organisation of sport (López-Carril et al., 2019; Lis, 2020; Lis & Tomanek, 2020; Teixeira et al., 2022; Hammerschmidt et al., 2023; Oliveira et al., 2023; Urbaneja et al., 2023), as well as all the actors involved in national and international sport development (Teixeira et al., 2016; Teixeira, 2019).

One of the areas that has made considerable advances in the field of scientific knowledge has been the in-depth study of the different types of sporting events (Vegara-Ferri et al., 2018; Cerezo-Esteve et al., 2022;

Ludvigsen et al., 2022) and their multiple impacts (Kokolakis et al., 2020; Teixeira et al., 2023; Reis et al., 2023), particularly major international sporting events. Science allows today, to know much more about the sporting, economic and social impacts (Barandela et al., 2018; Elahi et al., 2021), but also at the level of environmental responsibility and sustainability (Gulak-Lipka & Jagielski, 2020; Salgado-Barandela et al., 2021) and the very legacies that these events originate for the organising countries and their post-event temporal repercussions (Thomson et al., 2019).

On the other hand, it also allows an in-depth knowledge about the interests and motivations of those who participate in the sports spectacle itself (Theodorakis et al., 2019; Sorrentino et al., 2020), whether they are spectators, supporters, athletes, volunteers and others involved in the organisation of sports events, regardless of their typology (Hautbois et al., 2020; Ramos et al., 2022).

Sport has the unique ability to promote strong emotions, feelings of belonging and close connection which reveal themselves in different ways. These feelings, desires, aspirations and expectations become particularly relevant when we talk about major sporting events (Teixeira & Correia, 2011; Hautbois et al., 2020; Teixeira et al., 2023), particularly those that take place in predefined periods and with long periods between editions, as are the cases of the major international sporting events, i.e., the Olympic Games and the FIFA World Cup which take place every four years.

The bond to these mega events becomes particularly different from other sporting events of regular character and/or with a pre-defined calendar but of lesser expression, essentially due to the expectations created and the huge involvement and unique experiences they promote due to their singular nature (Kim et al., 2022).

The large-scale sporting events are quite complex and involve a whole structure that requires the execution of a strict protocol from its conception to its conclusion (Groschl, 2021), and in some cases they go beyond the period in which the event open to the public is concluded, but there is still a wide range of actions and tasks to be performed, in which the volunteers themselves are included.

The organisation of any type of event implies the execution of different tasks with different degrees of demand and responsibility, thus comprising a wide range of necessary human resources involved so as to ensure their success (Herold et al., 2020). In the case of sporting events, and in particular of global mega-events, this need takes on such relevance that volunteers become indispensable (Yoo et al., 2022), being a fundamental piece not only in the success of the event itself, but also for its simple execution (Lamb & Ogle, 2019; Won et al., 2021). The specificity of sporting events is so differentiating that they are considered the most sought-after type of event by volunteers worldwide (Lachance et al., 2021; Bakhsh et al., 2021).

Volunteers involved in the organisation and implementation of sporting events take on different challenges, and may perform quite specific tasks of great responsibility (Kim et al., 2019), such as monitoring athletes and technical staff, sponsors and institutional partners, media support, logistical support in the different sports venues, as well as direct support to the organisers and respective departments or directly to the events to be held, among others, acting as key elements for the normal course of the event (Chen et al., 2022). The staging of sporting events such as the Olympic Games involves complex logistical operations, and therefore requires a wide range of people involved to enable tasks to be carried out with maximum rigour, quality and dedication (Dickson & Darcy, 2022).

In this sense, and increasingly valuing their importance, several researchers have been trying to deepen scientific knowledge about the motivations and intentions that lead thousands of people to want to be associated with the organisation of sporting events, and the relevance and indispensable role of volunteers in the implementation of sport mega-events is clearly recognised.

Some studies even address the concern and study on the possible creation of legacies associated with future intentions of volunteers to join new events (Doherty & Patil, 2019; Elahi et al., 2021; Chen et al., 2022), thus allowing establishing a close connection at the level of involvement and commitment (Lachance et al., 2021). This deepening of the study on the motivations, intentions and expectations of sport event volunteers (Bakhsh et al., 2021; Won et al., 2021) also allows sport organisations themselves to develop challenging and stimulating volunteering systems, offering valuable experiences and contributing to the improvement of skills and knowledge of volunteers in exchange for their maximum dedication and commitment (Kim et al., 2019).

On the other hand, some researchers also mention the evident distinction for the differences between volunteers of sporting and non-sporting nature, pointing out that their categorization has particularities widely associated with specific motivations (Nichols et al., 2019; Teixeira et al., 2023). This fact, among others, makes it pertinent and current that further study on the motivations of sporting event volunteers should continue, demystifying beliefs and preconceived ideas, while ascertaining the various reasons surrounding the personal decision to join a certain cause (Zhuang & Girginov, 2012; Sorrentino et al., 2020; Lachance et al., 2021). The relatively long space of time in which sport mega-events take place, enhance the inclusion of volunteers from different geographical regions, with significant differences in terms of age and gender, as well as different motivations and expectations, intentions and objectives that evolve and change from event to event (Kim et al., 2019).

The renewal of generations of volunteers at sporting events, at the same time as others become recurrently associated with different events, promotes the opportunity to continue studying the motivations and reasons for

sport volunteering, looking for patterns of behaviour that will not only improve the experience, but help different organisations identify what volunteers are essentially looking for when associating with a particular event (Kim et al., 2019; Lachance et al., 2021; Okada et al., 2022).

The Olympic Games are effectively the most important sporting event in the world, with each edition having its own particularities (Thomson et al., 2019; Ludvigsen et al., 2022), causing different impacts and expectations not only in the organising country, but in the entire world population that takes advantage of its realisation to travel and witness the various events and live sporting events. The 2016 edition of the Olympic Games in Rio de Janeiro had its own particularities, not only for being a country widely acknowledged as a sports lover, but also for its high population size, distinct culture and unique geographical characteristics acknowledged by the international community (Oliveira et al., 2020), having registered one of the highest rates of registrations ever made in relation to previous editions and respective number of volunteers involved in its organization and realization.

Therefore, the main objective of this study was to analyse and identify the motivations of the volunteers who participated in the Rio de Janeiro 2016 Olympic Games (Brazil), as well as their perception of the results of this experience in terms of their degree of satisfaction and their personal and professional growth in relation to the different variables under study. This study aims to contribute to a deeper knowledge in the field of research in sports management, in particular, on the motivations and intentions associated with the practice of sports volunteering, thus increasing the existing academic information and improving the understanding of this specific reality.

Methods

Research design and participants

Considering the purpose of the research and the expected high number of volunteers participating in the 2016 Rio Olympic Games ($n > 50\,000$), it was necessary to first establish the universe under study, to subsequently design the best strategy and achieve the maximum possible responses.

In this sense, and after a thorough and exhaustive search in various sources of information and institutional sites without success, we decided to directly contact the Brazilian Olympic Committee (COB) in order to find out the existence of volunteers contacts as well as the possibility of accessing them with the purpose of conducting the present study. This direct institutional contact allowed access to some information about volunteers, specifically, the emails registered at the time of their registration and subsequent validation of registrations, thus reaching a quite significant number of volunteers ($n = 25\,241$).

Due to the high number of volunteers involved to which we had access, the option for data collection was the use of an online questionnaire survey, which was sent via email with information on the purpose of the study and the objectives we intended to achieve, while safeguarding the anonymity of each respondent.

The data were collected in the post-event period, and a response rate of 3.5% was obtained in relation to the universe, corresponding to 874 answers and 828 questionnaires were validated after analysis, which represented the study sample. After verifying the answers obtained, 46 questionnaires were withdrawn, as they presented some inconsistencies in the answers or were not duly completed.

Instrument

As mentioned in the previous point, the research used a survey by questionnaire to collect the necessary data, containing a total of 34 questions divided into two parts and made available online through the Google Forms platform.

As regards to its structure, we decided to use a semi-structured measuring instrument with mixed answers. The first part of the questionnaire aimed to characterise the respondents by collecting sociodemographic data and identifying their history as volunteers in sports and/or non-sports events, with a set of closed-ended questions aimed to better understand the sample under study. The second part of the questionnaire was designed to assess the general perception and level of satisfaction following participation in the event, as well as the motivations and expectations arising from the experience based on the volunteers own perception.

In the first part, we used the traditional sociodemographic variables that allowed us to characterise the sample, such as gender, age, marital status, profession, academic qualifications and continental region of origin. In the second part of the questionnaire, and due to the research objective of assessing motivations, perceptions of satisfaction and expectations, we chose to adapt the scale previously validated by Webb et al. (2000), which provides a response based on a 5-level Likert-type assessment scale. However, in order to standardize and classify the volunteers different perceptions, we adapted the scale to 7 levels, where 1 means "not very important" and 7 "very important".

The use of the online questionnaire survey was the best option, but also the most feasible to obtain the necessary data, since at the time of this research and respective data collection, the volunteers were already distributed by their respective geographical areas of residence.

Data collection and analysis

The research followed a quantitative-descriptive approach, using primary data collection to support the purpose of the study and its respective analysis through descriptive and inferential statistical methods and techniques to compare and assess the data obtained. In relation to the descriptive statistical methods and techniques for data analysis, measures of dispersion and central tendency were used, such as absolute and relative frequencies, means and standard deviations.

As for the methods and techniques of statistical inference, the level of significance to reject the null hypothesis was set at $\alpha \leq .05$. Student's t-test for one sample, Student's t-test for independent samples and One-Way ANOVA were used. The assumptions of these tests, specifically, the assumption of normality of distribution and the assumption of homogeneity of variances were analysed with the Shapiro-Wilk test and Levene's test. In situations where the sample size was higher than 30, the normality of distribution was accepted according to the central limit theorem. When homogeneity was not satisfied, the Student's t-test or the One-Way ANOVA with Welch correction were used. Statistical analysis was performed using the software Statistical Package for the Social Sciences version 25.0 for Windows.

Results

Sociodemographic characteristics of the volunteers

As previously mentioned, the study sample comprised 828 volunteers participating in the 2016 Rio de Janeiro Olympic Games after the respective analysis and validation of the responses obtained.

According to the data obtained (Table 1), there was a higher number of female volunteers (53.7%) compared to male volunteers (46.3%), and in both cases the volunteers were from 35 different countries.

Regarding the countries of origin, there was a high number of volunteers from the organising country (Brazil), representing 90.1% of the sample, followed by Portugal with 1.4% of the volunteers, Argentina and the United States of America with 1.1% each respectively.

As expected, the most representative age group was the volunteers between 16 and 25 years of age (38.6%), followed by the group between 26 and 35 years with 24.8%. Finally, it was found that the volunteers were mostly single (66.4%), with 68.0% having a Bachelor's degree, of which 17.9% were students and 16.8% were Teachers.

Table 1. Sociodemographic characterization of volunteers in the Rio 2016 Olympic Games

	N	%
Gender:		
Female	445	53.7%
Male	383	46.3%
Total	828	100.0%
Age:		
16-25	319	38.6%
26-35	206	24.8%
36-45	134	16.2%
46-55	103	12.4%
>55	66	8.0%
Total	828	100.0%
Marital status:		
Single	550	66.4%
Married	216	26.1%
Divorced	51	6.2%
Widow(er)	11	1.3%
Total	828	100.0%
Academic qualifications:		
Basic Education	29	3.5%
Secondary Education	186	22.5%
Bachelor's Degree	563	68.0%
Master's Degree	39	4.7%
PhD	11	1.3%
Total	828	100.0%
Continent of origin:		
America	783	94.6%
Europe	31	3.7%
Africa	7	0.8%
Asia	6	0.7%
Oceania	1	0.1%
Total	828	100.0%

Volunteer work experience and motivations

With regard to volunteering experience and motivations for volunteering, the respondents were asked about their previous participation in this area, trying to identify the existence or not of previous experiences in sporting events and what were the reasons and motivations identified for volunteering.

In this sense, the data obtained essentially show (Table 2) a very approximate value between respondents with previous volunteering experiences (47.6%) and those who participated for the first time (52.4%) in an event as volunteers. With regard to those who identified a previous volunteering experience, the majority (33.5%) indicated that this experience was related to participation in sporting events, while 25.1% of the sample with participations related to other types of event.

In relation to the reasons and motivations identified by the volunteers, we noted a considerable distribution as to the different reasons and motivations, there being no reason/motivation that particularly stands out from the others. However, we found that, essentially, the volunteers highlighted the feeling of pleasure (20.0%), improvement of the personal and professional curriculum (17.0%), passion for the Olympic Games (16.8%) and passion for sport (15.6%).

Finally, and a data that reinforces the importance and motivation associated with this particular experience, concerns the fact that 92.0% of the respondents stated that they would participate in the event again, while 7.0% might participate again and only 1.0% would not participate in the Olympic Games as a volunteer.

Table 2. Experience and motivations of volunteers at the Rio 2016 Olympic Games

	N	%
Previous experience:		
No	434	52.4%
Yes	394	47.6%
Total	828	100.0%
Type of event:		
Sporting Events	278	33.5%
Non-sporting Events	208	25.1%
Not applicable	342	41.3%
Total	828	100.0%
Motive for volunteering:		
Pleasure	166	20.0%
Improving the curriculum	141	17.0%
Passion for the Olympic Games	139	16.8%
Passion for sport	129	15.6%
Training/Improvement of foreign language	104	12.6%
Meeting people	79	9.5%
Other	63	7.6%
Attend events free of charge	7	0.8%
Total	828	100.0%

Perceptions about the experience at the Rio 2016 Olympic Games

The study developed had as its main objective the analysis of several parameters and indicators that would allow us to assess the level of satisfaction/motivation of volunteers of the Rio de Janeiro 2016 Olympic Games according to their own perception of the experience lived. In this sense, Table 3 allows us to check the evaluation made by the volunteers according to the variables under study.

When asked about the parameter which was most important after their participation in the event, the average (5.92) of answers was higher in the variable "Enjoyment promoted by the experience". In relation to post-event satisfaction, the volunteers valued on average (6.22) as most relevant the fact that "The experience was positive", however, the remaining fields obtained relatively close response averages, which allows a quite satisfactory analysis of their experience at various levels.

Regarding the perception of the importance and value of participating in the event in terms of personal development, the average number of answers was higher in the variable "Taking part in the world's biggest sporting event" (6.24), followed by the variable "Multicultural interaction" (6.21) and "Cultural and anthropological experience" (6.20). As far as the perception of satisfaction with the personal involvement in the event and the role played as volunteers is concerned, the average response was higher in the variable "I would attend a similar event again" (6.21), followed by "I missed the event after it ended" (6.02) and lastly, "I am satisfied with the role and tasks assigned to me" (5.92). These results show a strong and intimate connection regarding the way they perceive their involvement during the event.

Table 3. Perceptions on the experience of volunteers at the Rio 2016 Olympic Games

	Mean	SD
Perception of the importance of participation:		
Recognition and/or rewards received	5.36	1.86
Variety of activities developed	5.57	1.76
Enjoyment promoted by the experience	5.92	1.69
Perception of post-event satisfaction:		
Enjoyment promoted by experience	5.97	1.54
The experience was positive	6.22	1.49
Your contribution was important during the event	6.05	1.53
Your participation contributed to the success of the event	6.09	1.52
Perception of the importance of personal development:		
Personal knowledge	6.00	1.58
Personal and professional growth	5.95	1.66
Multicultural interaction	6.21	1.53
Socialisation	6.19	1.54
Cultural and anthropological experience	6.20	1.52
Making professional contacts	5.49	1.88
Making friends	6.01	1.61
Taking part in the world's biggest sporting event	6.24	1.60
Learning about mega events organisation	6.02	1.67
Perception of satisfaction with personal involvement:		
The tasks carried out allowed me to show my worth	5.19	1.93
I missed the event after it ended	6.02	1.73
Participation was important in my personal development	5.72	1.80
I would attend a similar event again	6.21	1.58
I am satisfied with the role and tasks assigned to me	5.67	1.82
I am satisfied with my performance	5.92	1.68
Perception of influencing factors after participation:		
Personal development	5.08	1.49
Greater connection to sport	4.85	1.61
Privileges of volunteering	4.90	1.59
Positive experience	4.94	1.55
Contribution to the community	5.15	1.44
Social and cultural development	5.22	1.43

Legend: 1 - not very important / 7 - very important

Finally, in order to verify factors of influence resulting from their participation in the event, the average response was higher in the variable "Social and cultural development" (5.22), followed by "Contribution to the community" (5.15) and "Personal development" (5.08). These results suggest that participation in the event mainly influenced factors of an exogenous nature and social enhancement.

Once the initial data obtained through the application of the questionnaire had been observed, the intention was to analyse and identify through descriptive and inferential statistical methods and techniques, comparing the different perceptions according to gender, marital status, age groups and academic qualifications, in order to deepen the knowledge about this specific reality.

Perceptions about the experience at the Rio 2016 Olympic Games according to gender

After the joint analysis of the data, the next aim was to compare the answers between male and female volunteers, trying to identify the existence or not of significant differences between genders (Table 4). In this sense, data point to some significant differences, evidencing a fairly consensual pattern of perception and satisfaction/motivation in relation to participation as volunteers in the 2016 Rio de Janeiro Olympic Games.

Table 4. Perceptions of the experience of volunteers at the Rio 2016 Olympic Games according to gender

	Male		Female		t
	Mean	SD	Mean	SD	
Importance of volunteer work	6.6	.9	6.6	1.0	0.454
Recognition and/or rewards received	5.5	1.9	5.2	1.8	2.068*
Variety of activities developed	5.6	1.7	5.5	1.8	0.782
Enjoyment promoted by the experience	5.9	1.7	6.0	1.7	-0.600
Enjoyment promoted by the experience	6.0	1.6	6.0	1.5	0.299
The experience was positive	6.2	1.5	6.3	1.4	-0.731
Your contribution was important during the event	6.0	1.5	6.1	1.5	-0.264

Your participation contributed to the success of the event	6.1	1.5	6.1	1.5	0.358
Personal knowledge	6.1	1.5	6.0	1.6	0.929
Personal and professional growth	6.0	1.6	5.9	1.7	0.484
Multicultural interaction	6.3	1.5	6.1	1.6	1.403
Socialisation	6.2	1.5	6.2	1.6	0.017
Cultural and anthropological experience	6.2	1.5	6.2	1.5	0.052
Making professional contacts	5.7	1.8	5.3	1.9	2.975*
Making friends	6.1	1.5	5.9	1.7	1.867
Taking part in the world's biggest sporting event	6.3	1.6	6.2	1.6	0.155
Learning about mega events organisation	6.1	1.6	5.9	1.7	1.505
The tasks carried out allowed me to show my worth	5.4	1.9	5.0	2.0	3.034*
I missed the event after it ended	6.0	1.7	6.0	1.7	0.064
Participation was important in my personal development	5.8	1.8	5.7	1.8	0.845
I would attend a similar event again	6.2	1.6	6.2	1.6	-0.486
I am satisfied with the role and tasks assigned to me	5.8	1.8	5.6	1.9	1.309
I am satisfied with my performance	5.9	1.7	5.9	1.7	-0.108
Personal development	5.1	1.4	5.0	1.5	1.058
Greater connection to sport	5.0	1.5	4.8	1.7	1.913
Privileges of volunteering	5.0	1.5	4.8	1.6	1.716
Positive experience	5.1	1.5	4.8	1.6	2.519*
Contribution to the community	5.2	1.4	5.1	1.5	1.241
Social and cultural development	5.2	1.4	5.2	1.5	0.456

* $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$

In the case of male volunteers, we highlight a higher average evaluation of answers for the variables "Importance of volunteer work" (6.6), "Taking part in the world's biggest sporting event" (6.3), "Multicultural interaction" (6.3), "The experience was positive" (6.2), "Socialisation" (6.2), "Cultural and anthropological experience" (6.2) and "I would attend a similar event again" (6.2). While for female volunteers the variables "Importance of volunteer work" (6.6), "The experience was positive" (6.3), "Socialisation" (6.2), "Cultural and anthropological experience" (6.2) and "Taking part in the world's biggest sporting event" (6.2) stand out. In other words, what is predominantly verified is that both genders evaluated and attributed similar significance to the same variables.

However, and no less important, it should also be noted that there were statistically significant differences regarding "Recognition and/or rewards received", i.e. men attributed greater importance to this dimension than women – $t(826) = 2.068, p=0.039$. The same occurred in the dimension "Making professional contacts", where males also attributed greater significance in comparison to females – $t(826) = 2.975, p=0.003$. In the dimension "The tasks carried out allowed me to show my worth", statistically significant differences were also found between genders, with males again attributing greater relevance to this field - $t(826) = 3.034, p=0.002$. Finally, the variable "Positive experience" also showed significant differences between males and females, with the former attributing greater value to this field when comparing the data – $t(826) = 2.519, p=0.013$.

Perceptions about the experience at the Rio 2016 Olympic Games according to marital status

Regarding the comparison made according to the marital status of the surveyed volunteers (Table 5), it should be noted that no statistically significant differences were found. Overall responses were quite similar, suggesting that marital status had no influence on the perception of satisfaction/motivation in relation to participation as volunteers in the 2016 Rio de Janeiro Olympic Games.

Similar to the comparison between genders, we found that the variables with higher average responses between groups were "Importance of volunteer work" (6.6), "Enjoyment promoted by the experience" (5.9-6.0), "The experience was positive" (6.1-6.3), "I would participate in a similar event again" (6.2-6.4), "Multicultural interaction" (6.1-6.3), Making friends (6.0) and "Socializing" (6.1-6.2).

Table 5. Perceptions of the experience of volunteers at the Rio 2016 Olympic Games according to marital status

	Single		Married		Divorced		F
	Mean	SD	Mean	SD	Mean	SD	
Importance of volunteer work	6.6	.9	6.6	1.0	6.6	1.1	0.038
Recognition and/or rewards received	5.4	1.8	5.2	1.9	5.3	2.0	1.115
Variety of activities developed	5.6	1.8	5.5	1.8	5.7	1.8	0.280
Enjoyment promoted by the experience	6.0	1.7	5.8	1.7	5.7	1.9	1.558
Enjoyment promoted by the experience	6.0	1.6	5.9	1.6	6.0	1.5	0.511
The experience was positive	6.2	1.5	6.1	1.5	6.3	1.3	0.371
Your contribution was important during the event	6.0	1.6	6.1	1.5	6.0	1.7	0.097
Your participation contributed to the success of the event	6.1	1.5	6.1	1.5	6.1	1.7	0.253

Personal knowledge	6.0	1.6	5.9	1.6	6.1	1.5	0.297
Personal and professional growth	6.0	1.6	5.8	1.8	5.8	1.8	1.618
Multicultural interaction	6.2	1.5	6.1	1.6	6.3	1.5	0.339
Socialisation	6.2	1.6	6.1	1.6	6.2	1.5	0.182
Cultural and anthropological experience	6.2	1.5	6.1	1.6	6.1	1.6	0.427
Making professional contacts	5.5	1.9	5.4	1.9	5.4	1.9	0.393
Making friends	6.0	1.7	6.0	1.6	6.0	1.5	0.128
Taking part in the world's biggest sporting event	6.3	1.6	6.2	1.7	6.2	1.6	0.084
Learning about mega events organisation	6.1	1.7	5.9	1.7	6.1	1.6	0.660
The tasks carried out allowed me to show my worth	5.2	1.9	5.1	2.0	5.2	2.1	0.280
I missed the event after it ended	6.0	1.7	5.9	1.8	6.1	1.8	0.681
Participation was important in my personal development	5.8	1.8	5.6	1.9	5.8	1.9	0.562
I would attend a similar event again	6.2	1.6	6.2	1.6	6.4	1.3	0.421
I am satisfied with the role and tasks assigned to me	5.7	1.8	5.6	1.8	5.6	2.1	0.176
I am satisfied with my performance	5.9	1.7	6.0	1.7	5.8	1.9	0.536
Personal development	5.1	1.5	5.0	1.6	5.1	1.6	0.499
Greater connection to sport	4.9	1.6	4.8	1.7	4.8	1.6	0.206
Privileges of volunteering	5.0	1.6	4.8	1.7	4.8	1.8	1.232
Positive experience	5.0	1.5	4.8	1.7	4.8	1.7	0.961
Contribution to the community	5.1	1.4	5.1	1.5	5.2	1.5	0.016
Social and cultural development	5.2	1.4	5.1	1.5	5.2	1.5	0.583

* $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$

Perceptions about the experience at the Rio 2016 Olympic Games according to age groups

With regard to the comparison of the answers obtained according to the different age groups in which the volunteers were included (Table 6), and in order to better frame the results, it was decided to define four groups.

In this sense, and after performing the respective statistical inference tests, no statistically significant differences were found between age groups, except for the variable "Making professional contacts" – $F(3, 648.411) = 3.108, p = 0.026$. In other words, the multiple comparison tests afterwards indicate that the significant differences are found above all in the volunteers aged less than 20 years and in those aged over 40 years, with the youngest volunteers assigning the highest value to this aspect.

Although there are no significant differences, it is possible to verify that there are higher response averages in certain variables that help to understand this approximation between groups, establishing an important level of comparability in relation to the objectives of the study. In this sense, and according to the surveyed volunteers assessment of satisfaction/motivation, we highlight the variables "Importance of volunteer work" (6.5-6.6), "Cultural and anthropological experience" (6.1-6.4), "Multicultural interaction" (6.2-6.3), "Taking part in the world's biggest sporting event" (6.2), "Socialisation" (6.1-6.3) and "The experience was positive".

Table 6. Perceptions of the experience of volunteers at the Rio 2016 Olympic Games according to age groups

	<20 years		21-30 years		31-40 years		>40 years		F
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	
Importance of volunteer work	6.6	.9	6.6	.9	6.5	1.1	6.7	1.0	0.602
Recognition and/or rewards received	5.5	1.7	5.4	1.8	5.2	2.0	5.3	1.8	0.945
Variety of activities developed	5.8	1.6	5.6	1.8	5.5	1.9	5.5	1.7	1.054
Enjoyment promoted by the experience	6.1	1.6	6.0	1.7	5.8	1.8	5.8	1.6	0.953
Enjoyment promoted by the experience	6.1	1.5	5.9	1.6	5.9	1.7	6.0	1.4	0.814
The experience was positive	6.3	1.4	6.2	1.5	6.1	1.6	6.3	1.4	1.109
Your contribution was important during the event	6.1	1.5	5.9	1.6	6.0	1.5	6.2	1.4	1.331
Your participation contributed to the success of the event	6.1	1.5	6.0	1.6	6.1	1.6	6.2	1.4	1.158
Personal knowledge	6.1	1.6	6.0	1.5	5.9	1.8	6.1	1.5	0.332
Personal and professional growth	6.1	1.6	6.0	1.6	5.8	1.9	5.9	1.7	0.798
Multicultural interaction	6.3	1.5	6.2	1.5	6.2	1.7	6.2	1.5	0.324

Socialisation	6.3	1.5	6.2	1.5	6.1	1.6	6.2	1.5	0.526
Cultural and anthropological experience	6.4	1.4	6.2	1.5	6.1	1.6	6.2	1.5	0.706
Making professional contacts	5.8	1.6	5.6	1.8	5.4	2.1	5.2	1.9	3.108*
Making friends	6.1	1.7	6.0	1.6	5.9	1.8	6.1	1.5	0.535
Taking part in the world's biggest sporting event	6.2	1.6	6.2	1.6	6.2	1.8	6.4	1.5	0.508
Learning about mega events organisation	6.2	1.6	6.0	1.6	5.9	1.8	6.0	1.6	0.507
The tasks carried out allowed me to show my worth	5.2	1.9	5.3	1.9	5.0	2.1	5.2	1.9	0.952
I missed the event after it ended	6.0	1.6	6.0	1.7	5.8	1.9	6.1	1.7	1.035
Participation was important in my personal development	5.8	1.8	5.7	1.8	5.5	1.9	5.8	1.8	0.707
I would attend a similar event again	6.2	1.6	6.2	1.5	6.1	1.7	6.3	1.5	0.524
I am satisfied with the role and tasks assigned to me	5.7	1.9	5.7	1.8	5.5	1.9	5.7	1.8	0.282
I am satisfied with my performance	5.9	1.6	5.9	1.7	5.9	1.7	6.0	1.6	0.323
Personal development	5.2	1.5	5.2	1.4	4.9	1.6	5.1	1.5	1.196
Greater connection to sport	4.8	1.6	4.9	1.6	4.8	1.7	4.8	1.6	0.491
Privileges of volunteering	5.0	1.5	5.0	1.5	4.8	1.7	4.8	1.6	1.669
Positive experience	5.0	1.5	5.0	1.5	4.9	1.7	4.9	1.5	0.354
Contribution to the community	5.1	1.5	5.1	1.4	5.1	1.5	5.2	1.4	0.459
Social and cultural development	5.2	1.5	5.3	1.4	5.1	1.5	5.2	1.4	0.374

* $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$

Perceptions about the experience at the Rio 2016 Olympic Games according to academic qualifications

Regarding the comparison of responses of volunteers participating in the 2016 Rio de Janeiro Olympic Games according to academic qualifications (Table 7), comparison tests were carried out demonstrating the existence of statistically significant differences in one of the variables under study.

According to the data analysed, the subsequent multiple comparison tests indicate the existence of significant differences in the variable "Making professional contacts" between volunteers with secondary education and those with university degrees, i.e. volunteers with less academic qualifications valued this dimension more highly compared with those with higher education – $F(3, 167.810) = 3.638, p=0.016$.

With regard to the remaining variables, and although no further statistically significant differences were identified, we again found patterns with very similar upper mean responses between groups for the same variables. Regardless of academic qualifications, volunteers also valued the "Importance of volunteer work" (6.6-6.7), "Taking part in the world's biggest sporting event" (6.2-6.3), "Cultural and anthropological experience" (6.1-6.3), "Multicultural interaction" (6.0-6.2) and "Your participation contributed to the success of the event" (6.1-6.2).

Table 7. Perceptions of the experience of volunteers at the Rio 2016 Olympic Games according to academic qualifications

	Basic Education		Secondary Education		Bachelor's Degree		Master's Degree/PhD		F
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	
Importance of volunteer work	6.7	.6	6.6	1.1	6.6	.9	6.5	1.0	0.413
Recognition and/or rewards received	5.1	2.0	5.7	1.7	5.3	1.9	5.1	1.9	2.403
Variety of activities developed	5.5	2.2	5.8	1.6	5.5	1.8	5.4	1.7	1.832
Enjoyment promoted by the experience	5.9	2.1	6.0	1.7	5.9	1.7	6.1	1.4	0.573
Enjoyment promoted by the experience	5.9	1.8	6.0	1.7	6.0	1.5	6.0	1.5	0.041
The experience was positive	5.9	2.0	6.3	1.5	6.2	1.4	6.3	1.6	0.659
Your contribution was important during the event	5.9	1.8	6.1	1.6	6.0	1.5	6.2	1.6	0.338
Your participation contributed to the success of the event	6.1	1.8	6.2	1.6	6.1	1.5	6.2	1.6	0.322
Personal knowledge	5.9	1.8	6.0	1.6	6.0	1.6	5.9	1.6	0.076
Personal and professional growth	6.1	1.8	6.1	1.7	5.9	1.7	5.8	1.8	0.666
Multicultural interaction	6.0	1.9	6.2	1.6	6.2	1.5	6.2	1.4	0.246
Socialisation	6.1	1.9	6.3	1.5	6.1	1.5	6.4	1.3	0.896

Cultural and anthropological experience	6.1	1.9	6.3	1.6	6.2	1.5	6.3	1.3	0.220
Making professional contacts	5.7	1.9	5.8	1.7	5.4	1.9	5.1	2.1	3.638*
Making friends	6.1	1.9	6.1	1.6	6.0	1.6	6.0	1.5	0.287
Taking part in the world's biggest sporting event	6.2	1.8	6.3	1.6	6.2	1.6	6.4	1.3	0.254
Learning about mega events organisation	6.2	1.9	6.1	1.6	6.0	1.7	5.9	1.5	0.530
The tasks carried out allowed me to show my worth	5.3	2.1	5.4	1.9	5.1	1.9	4.8	1.9	1.570
I missed the event after it ended	6.1	2.0	6.0	1.7	6.0	1.7	6.1	1.7	0.116
Participation was important in my personal development	5.7	2.0	5.8	1.8	5.7	1.8	5.7	1.8	0.206
I would attend a similar event again	6.1	1.9	6.1	1.7	6.2	1.5	6.2	1.5	0.302
I am satisfied with the role and tasks assigned to me	5.7	2.1	5.8	1.8	5.6	1.8	5.7	1.6	0.362
I am satisfied with my performance	5.8	2.1	6.0	1.7	5.9	1.7	6.0	1.6	0.134
Personal development	5.0	1.8	5.2	1.5	5.1	1.5	4.9	1.4	0.833
Greater connection to sport	4.9	1.8	5.0	1.5	4.8	1.6	4.6	1.7	1.308
Privileges of volunteering	4.8	1.9	5.0	1.6	4.9	1.6	4.6	1.5	1.185
Positive experience	4.8	1.8	5.0	1.5	4.9	1.6	4.7	1.5	0.675
Contribution to the community	5.0	1.8	5.3	1.4	5.1	1.4	5.0	1.4	0.929
Social and cultural development	5.0	1.9	5.3	1.5	5.2	1.4	5.1	1.4	0.604

* $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$

Differences between expectations and outcome of volunteers participation related to perceived enjoyment at the Rio 2016 Olympic Games

In order to improve the understanding of the topic under study and take the opportunity to analyse the data obtained from different perspectives, we decided to finalise the research with a comparison between initial expectations and the final outcome of the participation as a volunteer in the event (Table 8). To this end, we attempted to identify the existence of statistically significant differences in relation to the question "To what extent do you rate your satisfaction with the volunteer experience at the 2016 Rio de Janeiro Olympic Games?".

As regards the dimension "gender", the difference between initial expectations and the result of the participation is more favourable to male volunteers when compared to female volunteers, although the existing difference is not statistically significant – $t(826) = 1.511, p=0.131$. As regards the "academic qualifications" variable, there were no statistically significant differences between groups; however, it is possible to observe that volunteers with higher education qualifications, namely with a Bachelor's degree, present a positive result when compared to volunteers with a Master's or Doctor's degree – $F(3, 824) = 1.123, p=0.339$.

Regarding the dimension "gender", the difference between initial expectations and the result of the participation is more favourable to male volunteers when compared to female volunteers, although the existing difference is not statistically significant – $t(826) = 1.511, p=0.131$. As regards the "academic qualifications" variable, there were no statistically significant differences between groups; however, it is possible to observe that volunteers with higher education qualifications, namely with a Bachelor's degree, present a positive result when compared to volunteers with a Master's or Doctor's degree – $F(3, 824) = 1.123, p=0.339$.

In relation to "marital status", no statistically significant differences were observed between groups, and both present positive results when compared, particularly noting the difference between single and divorced people, where the latter present a higher perception between initial expectations and the result of participation – $F(3, 814) = 1.485, p=0.227$.

Finally, and when comparing the variable "age groups", we verify that the volunteers between 21-30 years of age are the only group that presents a negative result, which suggests that the result of the participation did not exceed their expectations, when compared to the next group of 31-40 years of age – $F(3, 824) = 1.262, p=0.286$. However, it should be noted that no statistically significant differences were found in this dimension either

Table 8. Differences between expectations and outcome of volunteers participation in relation to perceived enjoyment

Volunteer expectations according to gender					
	Male		Female		
Experience	Mean	SD	Mean	SD	t
-driven fun	0.10	0.90	0.01	1.0	1.511

Expectations of volunteers according to academic qualifications					
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	Basic Education		Secondary Education		Bachelor's Degree		Master's Degree and PhD		
Experience-driven fun	Mean	SD	Mean	SD	Mean	SD	Mean	SD	F
	0.05	1.7	-0.3	0.9	0.09	0.92	-.08	1.0	1.123
Volunteers expectations according to marital status									
	Single		Married		Divorced				
Experience-driven fun	Mean	SD	Mean	SD	Mean	SD	F		
	0.01	0.99	0.10	0.90	0.22	1.0	1.485		
Volunteers expectations according to age groups									
	<20 years		21-30 years		31-40 years		>40 years		
Experience-driven fun	Mean	SD	Mean	SD	Mean	SD	Mean	SD	F
	0.07	0.97	-.02	.97	0.08	1.11	0.14	0.87	1.262

* $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$

Discussion

The main objective of the research was to study the scientific field of sports science, and in particular sport management in the field of sport mega-events and the motivations of volunteers to participate in this particular and unique type of event.

In this sense, a strategy was designed that would allow reaching the largest number of volunteers involved in the implementation of the 2016 Rio de Janeiro Olympic Games, a task that, despite having reached a small part of the universe under study, allowed the analysis and identification of several parameters and indicators that enable a better and deeper understanding on the theme of volunteers in sporting events, their motivations and expectations. This thematic area has been widely studied (Bang et al., 2019; Lamb & Ogle, 2019; Kim et al., 2019b; Nichols et al., 2019; Lachance et al., 2021; Rozmiarek et al., 2021; Won et al., 2021; Gang et al., 2023), so the data resulting from this research allows us to contribute to strengthen and increase the existing scientific knowledge.

The results show that in relation to the sociodemographic profile, and contrary to what would hypothetically be expected, most of the volunteers involved are female (53.7%), in contrast to the male elements (46.3%). The most representative age groups were 16-25 year olds, followed by 26-35 year olds, representing 38.6% and 24.8% of the sample respectively. Most volunteers were single (66.4%), had higher education qualifications, namely university degrees (68.0%) and their geographical origin was from the organising country itself, i.e. they were resident in Brazil (94.6%).

Considering that, in terms of sports and federated practice, the overall figures point to a predominance of males (Blanco-Garcia et al., 2021), it would be expected that this superiority would also be evident in sports participation and volunteering. This situation suggests the possibility that the female gender is more susceptible and has greater motivation and interest for practices and voluntary participation in sporting events than the male elements themselves (Hallman et al., 2020). On the other hand, we can also question the reasons, interests and motivations that lead to greater female participation, particularly due to the fact that they are predominantly less physically active (Cowley et al., 2021). The study results highlight the possibility that the active practice of physical and sporting activity is not a highly relevant criterion in sports volunteering, particularly in sport mega-events (Cuskelly et al., 2021; Hayton & Blundell, 2021).

This finding is reinforced when we verify the reasons that volunteers point out for their involvement in the event, where, in most cases, pleasure (20.0%), improvement of personal and professional curriculum (17.0%) and passion for the Olympic Games (16.8%) were the main reasons for their participation. Some studies also point to a greater appreciation of issues linked to pleasure and emotional satisfaction (Hallman et al., 2020; Cho et al., 2020a; Rozmiarek et al., 2021; Chen et al., 2022), but above all to the multidisciplinary nature of the main reasons for volunteer participation in this type of event (Kragt & Holtrop, 2019; Cho et al., 2020b). These motivations also corroborate with the fact that the majority were volunteering for the first time (52.4%) and that only 33.5% of the sample had previous experience as a volunteer at sporting events.

The volunteering activity, globally, implies an involvement that goes beyond the possible direct connection to the scope of the activity developed (Bang et al., 2019), i.e., it is not exactly necessary that, within the context of sporting events, volunteers are primarily athletes and/or sports practitioners (Chen et al., 2022). The mega sporting events are highly multidisciplinary and complex events, where it is necessary to complete different functions and tasks with different degrees of demand and responsibility (Teixeira et al., 2023). In this sense, it seems evident and natural that these events arouse the interest in the participation of several people from different contexts and distinct professional realities (Cuskelly et al., 2021).

What is advocated, and attempted to study with this work, was to understand essentially the reasons, motivations and expectations that led volunteers to participate in this specific event and the results allow us to make some considerations in that sense.

First of all, the aggregated data show that the pleasure gained from the experience and the positive assessment made by the participation in the event (Nichols et al., 2019; Rozmiarek et al., 2021; Chen et al., 2022), but also the sense of achievement and satisfaction with the different tasks performed, were the points most valued by volunteers (Hallman et al., 2020). On the other hand, and in the more personal aspect, volunteers assigned greater value to the opportunity to socialise and cultural exchange between different people, thus establishing new friendships, while these experiences allowed for gains in their skills and knowledge, also recognising the opportunity to participate in the largest sports event in the world (Doherty & Patil, 2019; Lachance et al., 2021).

All in all, looking at the results, it can be inferred that the experience was not only extremely positive but also influenced the level of satisfaction and perception of participation in the event, which is reflected in the evaluation made by the volunteers when asked if they would participate in the event again and the answer was unequivocally positive, i.e. 92.0% of the sample answered yes, they would participate in the event again.

Therefore, it is in this sense that some researchers have sought to find answers, in order to understand not only the motivations to participate in a particular event (Lamb & Ogle, 2019; Lachance et al., 2021; Okada et al., 2022; Teixeira et al., 2023), which in itself is extremely valuable and allows replicating some strategies in future events, but above all to defend the idea of legacy within the scope of sports volunteering (Kim et al., 2019a). According to

Serapioni et al. (2013), it is extremely relevant to consider motivation as a way to ensure a continuity and involvement arising from volunteers, ensuring from the outset, the attribution and recognition of values and principles, but above all, an articulation between tasks to be performed vs. lived experience during each event. In other words, it is essential to create strategies not only to attract volunteers, but also conditions that allow them multidisciplinary gains, both at the personal, professional and social levels (Bang et al., 2019; Doherty & Patil, 2019).

In this field, it is important to remember that sporting events, especially of this type, depend immensely on their volunteers and that the success and image of the same will be as or more enhanced and positive, as the dedication, involvement and motivation of the volunteers themselves (Cho et al., 2020b) who are, in essence, a fundamental part, without any type of compensation or remuneration, in direct and indirect contact with all those involved in the organisation and execution of the event. That is, the decision to become a volunteer is a personal one, as are the interests and expectations created for participation in the event; however, the experience lived and the way this participation takes place has a profound impact on decision making for new experiences or not to repeat them at all (Lachance et al., 2021; Angosto et al., 2021; Chen et al., 2022).

Clary et al. (1998) define six functions of psychological nature closely associated not only with the decision to volunteer and get involved in a specific cause, but mainly with the gains and expectations that volunteers aim to achieve with their experience. In other words, it is important to consider: a) Values - desire to demonstrate humanitarian and altruistic values and attitudes; b) Understanding - desire to learn new skills and knowledge, while applying existing knowledge and skills; c) Social - desire to socialise and meet new people; d) Profession - desire to acquire knowledge and skills that promote improvements in the professional life; e) Protection - desire for belonging and protection in an attempt to reduce and/or overcome difficulties experienced or negative emotions in personal and/or professional terms; and, f) Improvement - desire to increase self-esteem through the cementing of knowledge, perception of being useful in what one is doing or maintenance of social status.

In conclusion, we believe that the study developed allows a contribution to the academic and scientific knowledge on this subject, by promoting greater knowledge about the participation of volunteers in one of the biggest events in the world, while identifying some indicators that allowed us to assess their satisfaction and motivation resulting from this participation.

The study was limited by the difficulty in obtaining a larger number of responses from the volunteers involved, both due to the evident distance between the different continents and the timeline between the event and the time when the study was carried out, i.e. there is a high probability that many of the volunteers did not respond due to lack of interest or because they no longer felt fully connected to the event and their participation. The high number of volunteers also made the task itself time-consuming, as did some email contacts that were not correct.

Conclusions

Scientific knowledge in sport management in general, and in particular in the field of organising and staging sport mega-events, currently provides in-depth knowledge of a reality that has a major impact on the development and sustainability of sport at various levels. The last decade has enabled a better understanding of the impacts resulting from the holding of various types of events, not only at sporting, economic and social levels, but also in relation to the very sustainability of the events, social responsibility and post-event legacy.

On the other hand, many researchers have also been trying to know in greater depth the motivations associated with the people who participate in the organization and execution of sport mega-events, especially in relation to sport volunteers. In this sense, this study and the resulting research data are a contribution to the existing knowledge and allow a better understanding of a specific reality, as well as what resulted from the experience and participation of a considerable number of volunteers involved in an edition of the Olympic Games. Basically, the results are in line with the shortcomings pointed out by several authors regarding the need to increase knowledge about the decision-making process for volunteering in this type of event, as well as the motivations and expectations before, during and after the event.

Science shows that a stimulating and positive experience is more likely to be repeated, so this should be one of the main focuses of those organising and designing a volunteer structure for participation and involvement in a world sporting event.

The study about the involvement and participation in sport mega-events is an area in broad growth, with multiple possibilities for research, and it seems essential to us that future studies focus on obtaining data before, during and after the event in an organization of this magnitude. This scenario will certainly improve the understanding of the motivations, expectations and satisfaction associated with sports volunteering and its temporal legacy, which promotes not only new participations, but also more efficient and effective participations that enhance the success of the events and the experience lived by all those involved, whether athletes, spectators, local residents, sponsors or executive and directive elements of the responsible organizational structures.

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