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# Unveiling the Impact of Mobile Fitness Applications on Motivational Orientation in Sustaining Exercise Behaviors: A Qualitative Investigation

**Authors' contribution:**

A) conception and design of the study
B) acquisition of data
C) analysis and interpretation of data
D) manuscript preparation
E) obtaining funding

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## Abstract

Notably, a lack of motivation appears as a significant contributing factor to physical inactivity, which raises one's susceptibility to noncommunicable diseases. While research indicates a strong link between smartphone fitness applications (apps) and people's motivational orientation towards physical activity and exercise, the theoretical basis of fitness app features for sustaining exercise routines remains unclear. Therefore, the purpose of this study was to investigate the utility of fitness apps as a behaviour modification tool on people's motivation to maintain physical activity and exercise behaviour. Using individual semi-structured interviews, we collected detailed accounts from nine active male and female fitness app users ($M_{age}$ = 23.4 years, $SD$ = 2.8). The findings of both inductive and deductive reflective thematic analysis revealed core themes emphasising that the use of fitness apps satisfies the participants' psychological needs through fostering emotions of competence, autonomy, and relatedness. Furthermore, fitness apps make it easier to track progress, challenge oneself, and compete against other exercisers, which further motivates participants to sustain their exercise behaviours. Confirming the use of fitness apps as an effective behaviour change tool for sustaining healthy exercise routines, the findings offer valuable feedback on specific app features for fitness software and wearable device developers that could potentially enhance the functionality and impact of their apps. Further discussions include limitations and areas for future research, such as discerning the role of fitness apps in sustaining motivation among diverse age groups with specific health, sport, or lifestyle goals in varying sensory, social, and affective contexts.

**Keywords:** Mobile fitness applications, motivation, physical activity, exercise behaviour

## Introduction

According to the UK Chief Medical Officers' physical activity recommendations (2019), people aged 18 to 64 should engage in at least 150 minutes of moderate-intensity or 75 minutes of vigorous-intensity aerobic physical activity every week. Despite these recommendations, 25% of people worldwide remain physically inactive (World Health Organization, 2016). Notwithstanding a notable rebound in physical activity levels to pre-COVID standards, England, like many other Western societies, currently observes a concerning decline, with nearly 500,000 fewer active young individuals (aged 16–34) than six years ago (Sport England, 2023). According to the World Health Organization (WHO), physical inactivity is a global issue and a primary cause of death, accounting for roughly 3.2 million deaths and 32.1 million disability-adjusted life years (DALYs) per year (World Health Organiza-

tion, 2023). Physical inactivity is linked to several health problems, including noncommunicable diseases including coronary heart disease (Gupta et al., 2016), stroke (Kuklina et al., 2012), type 2 diabetes (Admiraal et al., 2011), and malignancies like breast and prostate cancer (Knight, 2012). However, the impact of sedentary behaviour extends beyond physical health, as research has established a connection between inactivity and an elevated risk of mental health disorders such as depression (Zhai et al., 2015) and anxiety (Allen et al., 2019). Therefore, physical inactivity is detrimental both at the individual and societal levels, providing a strong basis for identifying the factors that influence the initiation and maintenance of physical activity and exercise behaviour.

**Motivation as Key Determinant of Exercise Behaviour**

In line with the widely recognized need of increasing physical activity, research seeks to uncover the causes behind noncompliance with exercise standards. According to the findings, low motivation is a substantial obstacle to starting and sticking to an exercise plan (Bauman et al., 2012; Wilson, 2012). In this regard, Maehr and Zusho (2009) define motivation as the process that determines the initiation, direction, quality, and persistence of goal-directed behaviour. There may be numerous motives to begin and continue physically active habits depending on the type of activity selected. For example, fitness initiation and participation are thought to be more motivated by appearance or health reasons, whereas sport initiation and participation are motivated by social reasons and enjoyment (Pedersen et al., 2021). Regardless of the type of activity or exercise setting, early intrinsic incentives derived from enjoying the activity and feeling competent in performing it are believed to be associated with heightened long-term commitment to physical activity or exercise (Emm-Collison et al., 2019; Richard et al., 1997). While it is true that people's motivation tends to fluctuate or change between the initial and adherence periods of participation (Hagger, 2019) there are several theoretical frameworks that explain the relationship between motivation and physical activity for a more nuanced understanding of people's exercise habits.

**Theories of Motivation**

Given the importance of motivation in understanding exercise adherence, distinguishing between extrinsic and intrinsic reasons for physical activity is crucial (Deci & Ryan, 2000). Extrinsic motivation in sports or exercise occurs when a person's engagement is influenced by external considerations such as avoiding censure or seeking recognition and/or rewards apart from the action itself (Deci & Ryan, 2007). In contrast, intrinsic motivation for physical activity derives from the natural sensations of enjoyment and satisfaction that one has when engaging in the activity (Pedersen et al., 2021). Expanding on this idea, a person may join in an athletic activity for the inherent sensation of belonging (Graham, 2021). Affiliation motives are particularly high in social circumstances such as team or co-acting sport (Kesenheimer et al., 2023), but less so in individual sport (Elbe et al., 2013). If an activity is perceived to be optimally difficult, an individual may be intrinsically motivated to participate in sport or fitness (Gavin et al., 2014). Competition is another well-known incentive for engaging in physical activity and exercise practices (Weinberg & Gould, 2019). While healthy competition may serve as motivation to engage in an activity (Ivanova & Korostelev, 2019), the pressure of competition may drive intrinsic motivation down due to the control it withholds over behaviour (Reeve & Deci, 1996; Ryan & Deci, 2017). In this regard, it is not straightforward to say that competition generates motivation in exercise and fitness. Nonetheless, a wealth of research shows that people have different motives for exercising, stressing the relevance of intrinsic motivation in exercise adherence (Huberty et al., 2008; Jekauc, 2015; Marin et al., 2018).

General cognitive-behavioural theories, such as the Theory of Planned Behaviour (TPB) (Ajzen, 2012) explains that attitude, subjective norms, and perceived behavioural control all contribute to one's intention to exercise. While there is ample evidence supporting the effectiveness of the TPB in explaining exercise behaviour (Azjen, 2015; Boudreau & Godin, 2007; Rivis & Sheeran, 2003), conflicting findings exist (Hardeman et al., 2002). Additionally, the impact of specific model components, such as subjective norms, in influencing exercise behaviour remains uncertain (Armitage & Conner, 2001). Albeit subjective norms are often used in interventions for behaviour modification, notably in sports and exercise (Azjen, 2011). Another explanation for engaging in physical activity and exercise behaviour is Bandura's Self-Efficacy Theory (Bandura, 1977). This theory emphasizes a person's belief in their capability to perform a behaviour as a key driving factor for personal improvement and persistence. In alignment with this, individuals with greater self-efficacy are believed to adhere better to physical activity and exercise (Collado-Mateo et al., 2021; Picha & Howell, 2018). The widely referenced Self-Determination Theory (SDT) (Deci & Ryan, 1985, 2000) provides additional insights into motivation in physical activity and exercise. A key assumption of this theory is that individuals are intrinsically driven toward personal growth, which influences their behaviour (Deci & Ryan, 2008; Ryan & Deci, 2017). Embedded within the SDT is the idea that motivation to engage in physical activity or exercise is brought on by the opportunity it offers to satisfy one's fundamental need for the feeling of competence, autonomy, and relatedness (Ntoumanis et al., 2021). Autonomy is described in this context as a sense of personal

causality in one's activities, competence is the ability to do something efficiently or successfully, and relatedness is the desire to feel connected and involved in the world (Ryan & Deci, 2017). Further explanations for motivation towards physical activity and exercise are understood through the Achievement Goal Theory (Nicholls, 1984). Hereby, an individual is motivated by their interpretation of competence, which might be viewed as low or high in relation to their prior performance or relative to others (Nicholls, 1984). Individuals who develop a sense of competence through their own efforts or improvements in personal task mastery, are thought to be task-involved. In contrast, individuals who acquire a feeling of competence through superior achievement compared to others are believed to be ego-involved (Harwood & Thrower, 2020). Subsequently, in this sense competition with oneself and others may motivate an individual to participate in physical activity and exercise.

What an individual attributes their achievement to can also be used to understand their motivation for exercise and fitness behaviour. In this respect, and in line with Weiner's Attribution Theory (1985), a high achiever's successful performance is often attributed to a stable component such as their aptitude or ability, which increases the predictability of, and motivation for future sporting efforts (Weinberg & Gould, 2019). Also, it is believed that striving for a perfect sporting performance positively impacts motivational orientation, encouraging one to enhance their sporting performance (Pitsiladis & Wang, 2015; Stoeber & Becker, 2006). More recent theorizations on motivation driving intervention approaches for public health include the Affective Reflective Theory (ART) (Brand & Ekkakiss, 2018). This dual process theory posits that an individual's automatic thoughts, experiences, and feelings related to exercise play a significant role in determining their motivation to engage in physical activity. For example, the presentation of an exercise related stimulus that elicits an automatic negative affective valuation (e.g., displeasure, humiliation) is perceived as a deterrent to engaging in exercise behaviour, but a positive affective valuation (e.g., pride, sense of physical reinvigoration) in response to the stimulus results in higher motivation for engagement if self-control resources are available (Brand & Ekkakiss, 2018; Conroy & Berry, 2017). So, in other words, the initial automatic affective valuation (type-1 process) forms the foundation for a regulated, reflective appraisal (type-2 process) that may occur when self-control capabilities are present. The automatic affective valuation is linked to an action urge (inclination to approach or avoid), while the controlled response can lead to the formulation of action strategies for engaging in physical activity and exercise.

The Theory of Energetic Cost Minimization (TECM; Cheval et al., 2018) is another recent explanation that deepens understanding of exercise motivation and physical inactivity. This theory suggests that people have an evolutionary tendency toward effort optimization and therefore are likely to avoid exercising if they think it would be too physically taxing or expensive in terms of energy. Individuals, on the other hand, might be inspired to engage in physical activities that they believe will require less energy expenditure. This can result in a predilection for passive behaviours or low-effort pursuits, which can increase physical inactivity (Brand & Cheval, 2019). In summary, comprehending various theoretical explanations of people's motivational orientation is crucial for facilitating behaviour change aimed at reducing inactivity and improving exercise adherence.

**The Use of Fitness Applications to Influence and Track Exercise Behaviour**

In recent years, mobile health and fitness applications (apps) that are linked to wearable devices such as GPS enabled smart watches, trackers, and rings have emerged as a potential remedy for inactivity providing individuals access to a wide variety of features ranging from personalized plans, tailored advice from experts or coaches, and the capability to monitor inactivity levels/workouts and nutrition intake (Scheid & Lupien, 2021). This can be extremely beneficial for those who are looking for a structured approach to improving their health and fitness with compelling evidence indicating a positive correlation between these apps and increased levels of physical exercise (Sullivan & Lackman, 2017; Yerrakalva et al., 2019). Consequently, there has been a dramatic rise in the use of smartphone fitness apps using wearable devices, smartphones, and tablets, especially since the COVID-19 pandemic (Eades et al., 2021) with a projected total of 86.3 million users of health or fitness apps in the United States alone (Ceci, 2023). Based on market research, some prominent fitness apps include Run keeper, Google LLC, MyFitnessPal, Sworkit, Runtastic (Adidas), Nike Run Club (Vantage Market Research, 2022). However, despite the persistent increase in fitness app users, a substantial attrition rate among exercisers who use these apps has been reported (Krebbs & Duncan, 2015) as many smartphone programs fail to consider the crucial elements of theory inspired behaviour modification strategies (Conroy et al., 2014; Middelweerd et al., 2014).

As a result, Molina and Myrick (2020) set out to explore how technology works and how users interact with such platforms. The themes that emerged from their research emphasised participants' individual motivations for using fitness apps (such as improved well-being), but they ignored any report on how well these apps support exercise behaviour and whether theoretical frameworks on motivation underpin the intentions of these apps. This study also raises various methodological problems. For

example, participants were mandated to utilize a designated fitness app for two weeks leading up to the interviews of which this approach fails to provide sufficient insight into the app's long-term impact on motivation. Drawing on the reasoning of Barber (2013), the positive outcomes observed in this study may be influenced by expectancy effects resulting from the implementation of these interventions. While other research indicates that personalization features and gamification of fitness programs that allow users to monitor personal behaviours are beneficial for motivation (Damaevius et al., 2022; Kari et al., 2016), there is little explanation as to how this relationship was established and whether theories on motivational behaviour can be applied in this context.

It is no secret that fitness apps often incorporate features like goal setting, self-monitoring, and feedback, which have been linked to autonomous motivation in physical activity and exercise (Hermsen et al., 2016; Knittle et al., 2018). Other factors cited as reasons for continuous usage of fitness apps include its utility, ease of use, satisfaction, goal achievement, and social connection (Zang & Xu, 2020). However, existing research in this field (e.g., Molina & Sundar, 2020; Sun et al., 2021; Tsai et al., 2021), primarily relies on quantitative approaches or preferences on app usage and fail to capture users' in-depth experiences on how the continued use of apps influence their long-term motivation. As a result, qualitative research that delves deeper into users' viewpoints is required to acquire a more comprehensive knowledge of the motivational influence of fitness apps. Using a qualitative method will offer context to this already-established link. Despite the recent spike in studies on how fitness app use changes an individual's intention to exercise (Huang & Ren, 2020; Zhang & Xu, 2020; Valcarce-Torrente et al., 2021), it ignores whether there is following change in the exercise habit portrayed. While traditional theory predicts that intentions and subsequent behaviour will match, this is not always the case, since the intention to do a behaviour may only account for 20–30% of future behaviour (Azjen, 2015). Consequently, the short-term links between fitness apps and intents may be insufficient in cementing the significance of fitness applications in influencing behavioural changes. As a result, the present study will address this issue by focusing on exercise output rather than just on the intention to exercise.

### The Present Study

Although research has identified distinctive fitness app features as variables for ongoing usage and exercise motivation (Hermsen et al., 2016; Knittle et al., 2018; Zhang & Xu, 2020), the theoretical underpinnings of these employed elements remain unknown. Furthermore, because most study focuses on activity intentions rather than actual exercise output, there is a dearth of understanding regarding the long-term maintenance of fitness levels utilizing these apps. Therefore, the present study aims to address gaps in the current understanding of using mobile fitness apps and wearable devices to sustain physical activity and exercise behaviour over time. It will collect qualitative in-depth perspectives and experiences on app usage and assess if modern-day fitness apps are influenced by theoretical frameworks on motivated behaviour. The central research question guiding this study is, "How does the use of mobile fitness applications influence motivational orientation in sustaining physical activity and exercise behaviour?" Our findings may offer valuable insights into the advantages and drawbacks of general fitness apps. These perspectives could have significant implications for utilising fitness technology as a practical tool for establishing and maintaining a healthy exercise routine.

## Method

### Research Design

In this study, we adopted a qualitative approach as the prevalence of quantitative research, which offers limited insights into how fitness apps sustain exercise behaviour, necessitates a compelling case for adopting qualitative designs to gain a deeper understanding of the practical value of fitness applications (Islam & Aldaihani, 2022). Furthermore, this research was influenced by a social constructivist approach, acknowledging how personal, social, and cultural elements affect the experiences of the participants (Lincoln & Guba, 2016). Embracing a relativist perspective (ontology) and a subjectivist transactional understanding (epistemology), we analysed how individuals perceived the use of mobile fitness apps while maintaining their exercise routines within the context of their own life experiences.

### Participants

The study sample included nine participants living in the United Kingdom, all of which were active fitness app users who engaged in weekly exercise. The mobile apps predominantly used by the study participants included Strava (N = 2), My Fitness Pal (N = 1), Fitbit (N = 2), and Apple Fitness+ (N = 4). Furthermore, two participants reported using multiple apps, depending on the type of exercise they were engaged in. These apps were integrated with wearable devices like GPS-equipped smartwatches from Apple and Fitbit, and mobile phones, which participants used during physical activity and exercise. Out of the participants, five identified as female (60%) and four identified as male (40%), with ages ranging between 19 to 27 years (Mage = 23.4, SD = 2.8). No participants were excluded from the initial sample. The recruitment strategy used was convenient sampling, as it was deemed the

most suitable for efficiently recruiting readily available participants. An invitation to participate in the study was disseminated through the lead investigator's social media profiles, including sport-related Facebook groups and Instagram. This approach was selected based on the insights from Topolovec-Vranic and Natarajan's (2016) scoping review, which highlighted social media as a more effective recruitment tool for targeting specific categories of potential participants compared to traditional methods. Eligibility criteria for participation in the study required participants to be 18 years or older, an active user of a fitness app that supported their fitness and exercise behaviour for a minimum of six months or longer, with at least 75 minutes of vigorous exercise or 150 minutes of moderate-intensity exercise per week for the past six months or longer. Following Malterud et al.'s (2016) model for evaluating information power in qualitative interview data, we ascertained that the recruited sample size for this study was sufficient. This conclusion considered several factors, including the diverse range of fitness applications utilised by participants, the study's alignment with pertinent theoretical models on motivational behaviour in sport and exercise, the proficiency of the researchers in exercise behaviour and qualitative interviewing skills, and the application of a cross-case analytical approach. Further validation was sought through consultations with an experienced research advisor and a trusted colleague, affirming the appropriateness of the chosen sample size. In this context, the concept of information power provides a more systematic alternative to using saturation as a sample size criterion in qualitative research. This approach addresses concerns raised by Morse (2015) regarding the transparency of saturation reporting, a concern supported by a systematic analysis of interview-based qualitative studies spanning a 15-year period (Vasileiou et al., 2018).

**Procedures**

Ethical approval to conduct the study was obtained through Northumbria University's Faculty of Health and Life ethics review system in the Psychology Department (approval number 52968). Participants who indicated an interest to participate were provided with an information sheet, either in person or via email. This document provided participants with a clear understanding of the study's purpose, requirements, and assurances regarding anonymity, confidentiality, and voluntary participation. After perusing the information sheet, participants completed a written informed consent form to indicate their willingness to participate. Following consent, interviews were arranged. At the commencement of the interview, participants accurate understanding on the study and their willingness to participate were again verbally confirmed, whereafter they were informed that the recording would begin. At the conclusion of the interview, participants were given the opportunity to discuss any aspects they had not previously mentioned, facilitating the generation of detailed and personal accounts. Participants were thanked for their participation and given a debrief sheet upon completion that reiterated the research aims, their right to withdraw up until formal data analyses, and relevant resources and information on the study topic. The debrief sheet also included contact information at the university for any further questions or concerns they may have had.

**Materials**

A semi-structured interview schedule that consisted of open-ended questions was used to explore exercisers' experiences and opinions on their chosen fitness app. Probes and follow-up questions were used to explore the participants' answers in greater detail. This interview method allowed us to cover key questions while giving participants the freedom to elaborate on their experiences in greater detail compared to a structured interview (Evans & Lewis, 2018). The questions focused on the app features that the participants were most interested in, how the apps influenced (or did not influence) their motivation to sustain exercise behaviours, and the impact apps had on their exercise and fitness habits. Example questions included "In the long term, how do you feel your fitness application(s) has sustained your exercise/fitness behaviours?", "What features of the application do you use the most?", "Are there any specific features of the applications that contribute to you continuing to use them? – (if so) how do you feel this influences your own physical activity and exercise behaviours?". Interviews were conducted either virtually through platforms like Zoom and FaceTime, or in person, based on participant convenience. The interviews took place in quiet rooms and typically lasted 30 minutes. All interviews were audio recorded and securely stored on the primary researcher's password-protected cloud storage account for transcription. The recordings were transcribed in verbatim using the Avrio online platform's transcription feature. All transcriptions were assessed to ensure complete accuracy and correspondence with the interview recordings. Instances where anonymity was compromised, such as the mention of names, were removed from the transcribed data. At the point of transcription, notes were made on the documents to support later coding and analysis. The audio files were deleted after they were no longer required.

**Data Analyses**

The data was analysed following Braun and Clarke's steps for reflexive thematic analysis, which is a theoretically flexible method' for "developing, analysing and interpreting patterns across a qualitative dataset" (Braun & Clarke, 2021. p. 4). A deductive approach was employed to assess how fitness app usage aligned with

current motivational frameworks. Additionally, an inductive approach was used to explore other ways in which these apps influence sustained motivation for exercise and physical activity. This combination of approaches ensured a comprehensive understanding grounded in motivational theory. Interviews were read multiple times to familiarise the researcher with the content, noting points of interest related to the research question. Subsequently, responses were coded to identify patterns in the findings. Coding examples were 'application increases autonomy' and 'competition increases motivation'. After carefully considering the coded transcripts, the codes were collaborated into themes. Later, the key themes were reviewed by an independent researcher to ensure they represented the whole data set, and quotations supporting each theme were selected to be reported on.

**Methodological Rigour**

To assure the integrity and credibility of the research, we employed Tracy's (2010) rigour criteria. Direct quotations were used to give voice to participants' experiences and to resonate with other fitness app users, enhancing the richness of the data. The lead author kept a reflexive notebook to ensure an in-depth engagement with the self and the identification of any biases or crucial events that may have influenced the data analysis and gathering methods. For example, the lead author uses a fitness app and has a good attitude towards such technologies. To mitigate the influence of researcher bias, coded transcripts and any areas of uncertainty in responses were relayed back to participants (Birt et al., 2016). In this respect, every participant was contacted and there was a 100% response in confirming the accuracy and completeness of responses. Moreover, the presentation of findings was anchored within the context of pertinent theories and literature to uphold objectivity (Green & Glasgow, 2006). Additionally, negative cases, where participants expressed indifference towards app usage, were thoughtfully included in the analysis (Morse, 2015).

## Results and Discussion

The current research explored individuals' experiences of how using their chosen fitness apps influenced their motivational orientation to sustain physical activity and exercise habits. The results of this study highlight that fitness apps affect motivation to exercise in two main ways: through meeting basic psychological needs and facilitating self-evaluation and competition with others.

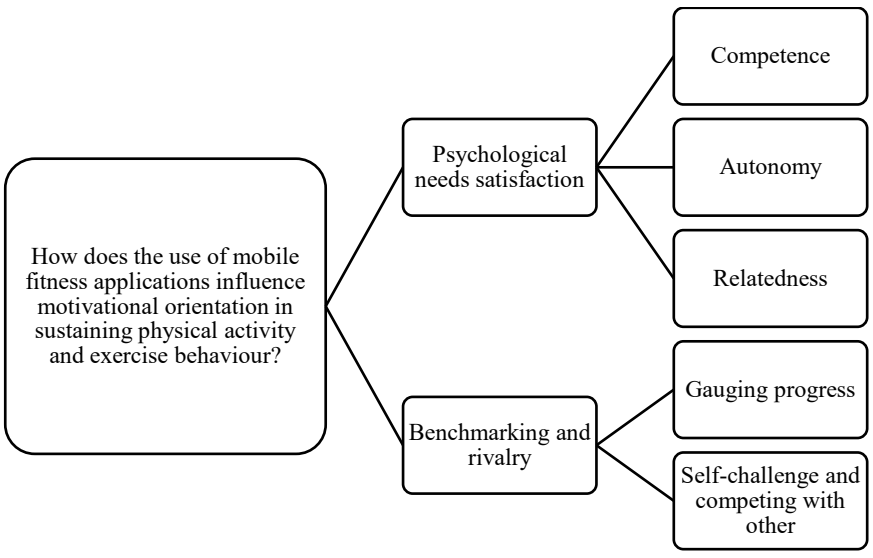


**Figure 1**. Thematic map displaying how the use of fitness applications influences motivational orientation in sustaining physical activity and exercise.

**Psychological Needs Satisfaction**

The findings show that fitness applications contribute to the sustainability of motivation for exercise by allowing the fulfilment of psychological desires. Participants explicitly indicated that using fitness apps made them feel more competent in their own abilities, independent, and in charge of their exercise behaviour, as well as a higher sense of closeness with other exercisers. The feedback from participants on the use of fitness apps is consistent with the principles of Self-Determination Theory (Deci & Ryan, 1985), which like the views presented in exercise contexts (Teixeira et al., 2012; Kang et al., 2019) agree

that the presence of conditions that support an individual's competence, autonomy, and relatedness fosters high-quality motivation for engaging in and maintaining exercise behaviours. Furthermore, this discovery lends support to prior research by Molina and Myrick (2020), which demonstrated the relevance of motivation in the utilisation of fitness apps but fell short in providing a comprehensive theoretical foundation for such usage. In contrast, the present research establishes a connection between the use of fitness apps and significant motivational theories, such as Self-Determination Theory (SDT). This enhances our understanding of fitness applications as an effective strategy for behaviour modification. The connection is exemplified through the subthemes discussed below.

**Competence**

This subtheme represents the idea that the use of fitness apps made users feel more competent regarding their abilities. Competence is hereby understood as an individual feeling confident in their capabilities to successfully accomplish an outcome or perform a task (Vansteenkiste & Ryan, 2013). To elaborate on this, most participants highlighted that being able to see a visual trail of evidence of their performance data on their fitness app increased their feelings of competence and confidence in their ability.

> *"The app makes me feel more competent because I can see how I have improved over time and how well I am performing. Um, which proves to myself that I can do more than I sometimes think I can."* – P4.

> *"Even though you kind of know it in your own self, the extra data, it just gives you that little confidence boost."* – P9

The ability to view past performances is a feature of fitness apps that helps users feel more competent and confident in their abilities, which enhances the likelihood that they will continue exercising. These results are in line with those yielded by Kari et al. (2016), who suggested that tracking one's own fitness activities can help with motivation. Furthermore, this idea complements Hermsen et al.'s (2016) findings, which were based on a rigorous evaluation of the literature and confirmed the utility of feedback via digital technology as an effective strategy to respond to undesired habitual behaviour. However, the current research can add to previous works by describing how these fitness apps are useful for motivation in specific ways, such as by providing visual reinforcement of skill and showing evidence that users are getting better over time, which have been suggested to elicit exercise behaviours even on days where participants would not typically exercise. Moreover, fitness apps were also suggested to enhance exercise competency by providing personalised workout routines and instructing individuals on the correct execution of specific exercises. This added guidance instils exercisers with a sense of confidence, knowing they are following the right techniques. In this way, the app's exercise demonstration feature fosters a better execution of the exercise and increase motivation to keep working out.

> *"You can get like a demo of how you actually perform the exercises. I guess this makes me sort of feel more confident that I am doing things correctly.... In the past I have held back from exercising by thinking I did not know what I am doing in the gym, but because the app makes me feel more competent, I am more likely to do the exercise and do it well." – P 3*

Because of the app's tailored sessions and exercise demonstration features, this increase in exercise motivation may provide cognitive resources to exercises, which, according to the Theory of Energetic Cost Minimization, can weaken the automatic tendency towards effort optimisation (Brand & Cheval, 2019). Therefore, the recent literature on the use of fitness apps to initiate exercise behaviour (Huang & Ren, 2020; Zhang & Xu, 2020; Valcarce-Torrente et al., 2021) benefits considerably from this influence on the quality and persistence of exercise output.

**Autonomy**

The use of fitness apps enhanced participants' feelings of autonomy, which refers to one's freedom of choice over their actions, such as choosing to exercise on their own volition rather than under pressure from others (Ryan & Deci, 2017). All the participants acknowledged that using their fitness apps gave them a sense of control over their exercise behaviour and placed additional focus on the personalisation of such apps to increase their sense of autonomy.

> *"I think because I have the app, like I feel like I enjoy being in charge of my own exercise and what I log. As I say, it is like my own workout journal. So, I feel accountable to myself for what I log and track on there."* – P3

> "*It gives me autonomy as I can use it as and when I need it to monitor my own exercise. So, I am sort of in control of what I'm doing ... I can use it to set challenges and personalise workouts to suit me."* – P6

> [When asked how fitness application usage influenced their autonomy] – "*I can set my own schedule with it. I've got goals that I can set ... it allows me to design my workouts."* – P8

Fitness applications clearly influence exercise motivation by increasing a person's sense of behavioural control. This is made feasible by software features that allow users to personalise their workouts, create personal objectives, and keep a private activity journal. These findings back up Deci and Ryan's (2000) SDT, which states that for behavioural changes to occur, people must be able to manage their own behaviour. Furthermore, the findings are similar with Kang et al.'s (2020) findings that autonomy has a substantial predictive potential for exercise adherence over a six-month period. This shows that when aiming to induce sustained behaviour change in an exercise setting, encouraging control over exercise behaviour is critical. Hereby, more information about the mechanisms of fitness applications that cause these changes in autonomy is provided by these findings, which also help us better grasp the viability of these applications for their function in long-lasting behaviour change.

**Relatedness**

Another subtheme under psychological needs satisfaction represents feelings of relatedness that stems from fitness app usage. Relatedness is here understood as a feeling of being part of a community of individuals who share interests. This is notably accomplished through fitness app features enabling users to add friends and contacts.

> *"You really get a sense of community because you can add your Facebook friends and your phone contacts, and just all being in it together really is quite nice."* – P1

> *"I think I enjoy feeling like part of something. The feature of having friends on the exercise app, it like creates a sort of community and makes me feel involved."*– P3

Participants expounded on this concept suggesting that by continuing their workout regimen, they might further blend into the established community.

> *"It's like a sense of feeling of wanting to carry on and, you know, fit in."* – P2

> *"The app like makes a community of people, and I want to keep using the app and keep exercising to sort of feel like I still fit into that."* – P3

Considering the research question guiding the present study, it may be noteworthy that users of fitness apps also continue to exercise because they do not want to feel excluded from the community these applications create, in addition to the ways in which they foster a sense of connection among others. This sub-theme concurs with the findings of a mixed methods investigation conducted by Zang and Xu (2020), which underscored the opportunity for 'social connection' as a primary factor for college students' continuance intention to use fitness apps. This aligns with the SDT (Deci & Ryan, 2000) and other research showing that feeling a part of a group or community of people who have similar interests should improve a person's desire to sustain related behaviour (Beal et al., 2003) and preserve the connections established through fitness apps. According to Maslow's hierarchy of needs (Maslow, 1943), the idea that feeling related is a key determinant of one's behavioural orientation further establishing the participants reasoning for sustaining their exercise behaviour and app usage.

It is interesting to note that one person's ideas about meeting the need for relatedness differed from those of every other participant. While most participants said that using a fitness app would boost their emotions of competence, autonomy, and relatedness, participant 5 said that while using this feature of their fitness app was "nice", they did not necessarily find it to be particularly motivating. When questioned further if application features help their exercise habits, participant 5 said, "Not really" stating that their sustained engagement in exercise is more a result of previously established habitual conduct. This underlines personal habits and routine as a motivating element related with exercise adherence because not all people' motivation to continue exercising is reliant on fitness app use. Important to note is that this participant was the only one from the sample that reported engaging in team activity, such as football, as opposed to individual exercise behaviour. Therefore, it may be that using fitness apps is not as relevant at sustaining exercise and physical activity in group exercise, as it is in solo fitness behaviours. Findings from this participant may be supported by the fact that enjoyment is the primary motivator for group sports participation (Frederick & Ryan, 1993), and that group exercise has been shown to produce greater satisfaction of the need for relatedness and belonging than individual contexts (Lovell et al., 2015). In these circumstances, additional motivational support from apps may not be necessary for a person to maintain their exercise habits. Therefore, these findings offer an intriguing way to compare the efficiency of fitness applications as a behaviour modification strategy in individual and group environments in future studies.

**Benchmarking and Rivalry**

The use of fitness apps, which make it possible to track progress and participate in challenges and competitions with others, influences motivation to maintain physical activity and exercise, which is another key finding of the study. According to the Achievement Goal Theory (Nicholls, 1984), a person might be motivated by rais-

ing their standards of self-reference (task mastery) or by competing with and outperforming others (ego goal orientation). According to the participants, self-monitoring of progress and rivalry with oneself and other app users are two ways that fitness applications affect motivation to keep exercising. The subthemes below present these findings in further detail.

*Gauging of progress*

This subtheme outlines how most participants felt their fitness apps allowed them to observe previous workouts and activities, which gave a foundation for improvement and a motivation to continue with their exercise regime. Furthermore, fitness apps and the display of previous performance allowed users to set objectives for future exercise.

> *"With the statistics ... they allow me to sort of like compare to my previous workouts ...it also allows me to sort of exercise more and try lower and improve my times."* – P2

> *"It [the fitness application] really helps to show how I've improved over time, which is a big motivator."* – P4

> *"Seeing previous results on my watch makes me want to progress each week."* – P7

In this regard, it is recognised that the use of fitness apps provides exercisers with the opportunity to record and evaluate prior performances, which facilitates motivational orientation in sustaining exercise and physical activity for self-improvement. This is consistent with the Achievement Goal Theory (Nicholls, 1984), which confirms the motivational effect of accomplishing task-oriented goals (Elliot & McGregor, 2001). The suggestion that self-monitoring of behaviour via apps is advantageous for enhanced exercise motivation is consistent with the work of Rockman and Maier (2019) and Rockmann and Gewald (2018), who prioritise self-monitoring features as catering to those with task mastery aspirations. This conclusion is also consistent with earlier research that shows how self-monitoring enhances autonomous motivation (Knittle et al., 2018).

*Self-challenge and competing with others*

This subtheme demonstrates that most participants said that seeing their peers exercising via the apps increased their drive to maintain physical activity or exercise. Participants reported increased motivation as well as an increase in exercise output because of competing with others.

> *"For example, it is 7:00am and someone has done a workout. It kind of gives you a little bit of motivation to be like, if they can do it work, can I not do it."* – P9

> *"It [having friends on their application] drives me to be better... I want to be thinking I could beat that ... So, it drives me to get to the next workout."*– P8

> *"It [comparing with friends on the application] makes me feel like a little bit competitive… it gives me a goal to push me to run a bit more."* – P6

It may thus be accepted that fitness apps alter one's drive to sustain physical activity and exercise by creating a basis to compete with peers. Again, this perception is warranted by the Achievement Goal Theory, which proposes that ego goal-oriented persons are motivated by outperforming others as it is regarded as a form of success (Nicholls, 1984). Building upon the notion that social comparison through fitness app leaderboards can boost physical activity (Wu et al., 2015), the present study assessed if this holds true for apps beyond Nike running, such as Apple Fitness+, Fitbit, and Strava. By doing so, our findings can contribute to a broader understanding of how various fitness applications influence motivation and long-term exercise behaviour, leading to a more comprehensive view of fitness apps in general.

While fitness apps linked to wearable devices are associated with increased motivation in ways such as providing competition, it is recommended that applications suit an individual's goal orientation for motivational transformation to occur (Rockmann & Maier, 2019). In this aspect, it may be more reasonable to suggest that apps can assist people stay motivated to exercise if the app and their goal orientation are compatible. As a result, in situations where goal orientation is not supported, it is probable that motivational and behavioural gains will not occur. Based on this line of reasoning, one participant's suggestion that they do not use fitness apps as "motivation to get up and do something" does not undermine the motivational capacity of such applications; rather, it may indicate a mismatch between the user's goal orientation and their respective app's motivational features. As a result, it is critical to analyse elements of fitness app usage on a subjective basis, which allows future studies to assess how personal motivational differences correlate with the varying use of fitness apps.

While not prominent enough to record as a separate theme, it is worth noting how participants described the fitness app function of push notifications as eliciting feelings of guilt, especially when they had not previously exercised.

> *"The apps have notifications which kind of perpetuates the guilt."* – P1

> *"I sort of feel guilty if I haven't done or logged any exercise that day and I get the notification."* – P3

Similarly, another participant highlighted notifications to elicit exercise behaviour, which otherwise would not have occurred.

> *"It alerts me that I've not done enough exercise in an hour, that encourages me to exercise and to make time to exercise when otherwise I might not."* – P4

While this discovery was not conclusive, it offers valuable insights into the influence of push notifications on exercise behaviour, paving the way for future investigations. The Affective Reflective Theory (Brand & Ekkakiss, 2018) underlines the function of an exercise-related stimulus in eliciting automatic positive or negative evaluations that can either increase or decrease regulated actions leading to exercise participation. As a result, this discovery lays the groundwork for future research into the nature and frequency of push notifications used in apps and wearable devices in relation to exercise behaviour, including the mediating role of guilt in this process. Another interesting finding is that when asked if fitness apps had any psychological drawbacks, a considerable percentage (half) of the participants described their use as obsessive. While this does not directly address the research question, it does shed light on how fitness app users may exercise out of a desire for acknowledgment. Previous studies have already shown that ego-involved contexts, such as competitive apps, have a positive association with exercise commitment (González-Cutre & Sicilla, 2012). Nevertheless, the impact of this fixation on obsessive health monitoring and recognition on exercise behaviour remains uncertain. This is an area that warrants further investigation for fitness app and wearable manufacturers, considering the emerging belief that obsessive health monitoring in certain individuals could potentially have adverse effects on their health and sleep. Finally, it is necessary to highlight the views of one participant who suggested they would continue to exercise irrespective of using their fitness app. When questioned if their app influenced their motivation to exercise, the participant responded, "*because of what I am doing [running a marathon], I'm just going to have to do it [exercise] anyway"* (P9). In contrast to other participants who were not primarily motivated by the nature of the sport, one individual placed significant emphasis on the requirements of the sport, considering them sufficient to drive exercise behaviour even without the support of a fitness app. This narrative aligns to Toner and colleagues' (2023) recent findings that distance runners may have developed a situational awareness ('habit-body') that eschews mobile technology use in favour of their embodied needs to train. Toner et al (2023) also note in their study that mobile fitness technology frequently lacks context-specificity (e.g., weather conditions), which in the case of distance running makes exercisers' somatic experiences more meaningful than real-time statistics. While it has been proposed that people with personified identities, such as marathon runners, have elevated levels of self-determination to sustain exercise behaviours (Qui et al., 2019), more research into the effectiveness of mobile fitness apps as a behaviour modification tool in relation to various spatiotemporal, sensory, social, and affective contexts would be beneficial.

# Conclusion

The current study builds on earlier quantitative findings (Molina & Sundar, 2020; Sun et al., 2021; Tsai et al., 2021) by investigating how fitness apps work as a behaviour modification tool for maintaining exercise behaviours. The findings show that mobile fitness apps encourage physical activity and exercise habits by meeting exercisers' psychological demands for competence, autonomy, and relatedness through features like tailored sessions and exercise demonstration, goal personalisation and social connectivity. These apps also provide progress tracking and peer challenges, which not only stimulates exercise output but also corresponds with popular motivational theories that explain behaviour change for prolonged physical activity and exercise. The strength of this study is that it draws on the rich and significant insights provided by individuals who have engaged in prolonged exercise practises as defined by the World Health Organisation (2016) while having varying fitness goals and app preferences. Our findings, however, were based on a relatively youthful cohort (19–27 years old), which is a limitation of our study given that 41% of fitness app users globally are aged 30–39 (Statista, 2023). As a result, careful data analysis is essential, because older users may interact differently with these apps, impacting motivational orientation for continuous activity. However, the findings are essential for fitness app developers since they provide theoretical reasoning and insight into the core fitness app features that are primarily responsible for maintaining exercise behaviours. Future research should investigate into the motivational role of fitness applications in connection to specific health, sport, or lifestyle goals of diverse groups of exercisers from varying sensory, social, and affective contexts to gain a better understanding of their efficacy in sustaining behaviour change.

**Competing interests**

The author(s) of a paper submitted to *Physical Culture and Sport. Studies and Research* are required to declare competing interest for any commercial associations or financial interests held by the author.

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**Data accessibility statement**

The dataset supporting the results of the study is available upon request.

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# The Complex Club-Fan Relationship: A Glimpse into Stakeholders' Experience With the Aggressive Interventions of Fans

**Authors' contribution:**

A) conception and design of the study
B) acquisition of data
C) analysis and interpretation of data
D) manuscript preparation
E) obtaining funding

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## Abstract

This study aims to understand the club-fan relationship from the standpoint of club owners, CEOs, and head coaches (i.e., managers). Eight in-depth interviews were conducted with prominent figures from professional football and basketball in Israel. The current findings indicate that while clubs need the support of their fans, they often find themselves struggling with their aggressive behavior and demands to influence the club's decision-making processes. First, this qualitative research provides an important insight into the unique experience of pivotal decision-makers in professional sports. Second, we apply the *complexity* lens to discuss the challenges faced by such stakeholders when trying to manage fans' disruptive interventions.

**Keywords:** sports fans, sports club, team sports, management, complexity

## Introduction

Consumption of professional sporting events is a major, ever-increasing segment of the sports industry (Biscaia et al., 2021). Professional sports owe much of their existence to public interest, without which media companies would not pay such large sums for the right to broadcast these games on television (TV) and companies would not pay even larger amounts for the right to advertise during such matches. In football, for example, TV rights accounted for 38.8% of the English Premier League's (EPL) revenue in 2014–2015 (Carreras & Garcia, 2018). Without spectator attendance, clubs would encounter great difficulty generating much-needed income from gate revenue. As such, public interest, manifested through a broad fan base, is an essential element for enhancing professional sports clubs and leagues (Da Silva & Las Casas, 2017). It has even been argued that sports events transcend beyond value delivery (where fans are viewed as passive value consumers) towards interactions and value that is co-created by fans and teams (Kolyperas et al., 2019). It therefore seems that clubs and fans form a type of symbiosis, where one cannot exist without the other.

Achieving a better understanding of consumer behavior in sports is not a new field of interest among researchers, sports professionals, and clubs' stakeholders (e.g., Crawford, 2004; Funk et al., 2016; Madrigal & Dalakas, 2008). Attempts have been made to define a sports consumer typology to serve as the foundation of market segmentation models, and which could link consumer behaviors to different demographic, social, and cultural groups. In turn, such models could enable more targeted marketing activities, price sensitivity monitoring, arena reconfiguration, and customized sports experiences – to

fit the specific needs and requirements of each customer segment (Stewart et al., 2003). In general, sports fans are conceived not merely as passive receptors; they are individuals who are highly interested in a certain team or athlete, and even attempt to play an active role in the game (Da Silva & Las Casas, 2017). Samra and Wos (2014) identified three unique features of fans as consumers: (1) possessing a strong, intense, and emotional attachment to the consumption objects; (2) behaving as loyal consumers; and (3) presenting informal membership behaviors, such as co-production and investment. The relationship between fans and the object tends to be active and proactive, with active participation distinguishing fans from general consumers.

Tapp and Clowes (2002) identified several segments of fans – based on their value to the club – on a continuum from casual spectators to fanatics. Giulianotti (2002) proposed four types of football spectators: supporters, fans, followers, and flâneurs. While supporters and fans are "hot", followers and flâneurs are "cool" – referring to the degree to which the club is central in the individual's self-formation and identification. Crawford (2003) addresses the development and fluidity of sports supporters, introducing a model of the fans' induction and career progression. The career of a fan could start with a general interest that later evolves into engagement and enthusiasm. This ongoing and evolving process has the potential to create devoted fans. Hunt et al. (1999) identified several types of sports fans based on their level of attachment, in particular, at the far end of Hunt's spectrum, the dysfunctional fan relies on "being a fan" as a primary source of self-identification, engaging in behaviors that disrupt club activities and related social exchanges. In the current study, we will apply the term *dysfunctional* to denote over-involved, aggressive, and disloyal fans.

Fan behavior is often cited by coaches and players as a determinant of the club's success, rather than a consequence. This premise corresponds with Da Silva and Las Casas (2017), who emphasize that the active role of fans in games, including their presence, engagement, and involvement, influence the team's achievements. Indeed, spectators at sporting events are not just passive customers. They play an integral role in the entire service setting (Stieler et al., 2014), and their behaviors strongly impact the customer experience inside the stadium (Chen et al., 2013). Moreover, fans who are loyal and engaged co-create value with their teams by building a positive atmosphere (Uhrich & Benkenstein, 2010); they also generate a constant income, since their demand for tickets and merchandise is relatively immune to the potential ups and downs in on-pitch performance (Yoshida et al., 2014). Additionally, devoted fans may provide their club with logistical and financial support, organize a fan club, and even lobby for their team at the municipal level (Gibbons & Dixon, 2010). As such, much of the existing research focuses on the beneficial manifestation of fandom.

Yet negative forms of fanhood also take place, such as dysfunctional fans throwing objects onto the pitch, setting off firecrackers, and publishing offensive posts on social media. These actions have undesirable social, managerial, and sports-related consequences, which disrupt the positive atmosphere and may even endanger people; clubs may even incur fines due to the unethical or illegal behavior of their fans or suffer from decreased team performance due to stress (Huettermann et al., 2019). Even non-violent acts of silence, in which fans refuse to engage in singing and cheering, can considerably affect the game (Stieler et al., 2014).

Fans' hyper-engagement can quickly deteriorate into forceful and disruptive interventions, with fans violently rejecting certain players, based on race and ethnicity for example, while demanding the same rights as the club's managers and directors (Ben-Porat, 2008; Cleland, 2010; Lomax, 2000). In addition, organized support is expressed through a spectrum of processes, from unconditional loyalty (Neale & Funk, 2006) to boycotts and harassment of managers, often in response to long-term decreased team performance (Koerber & Zabara, 2017). Interestingly, fans' aspirations to influence sports clubs and organizations is well-documented from as early as the nineteenth century (Taylor, 1992).

The term *fan activism* (Olesen, 2018; Totten, 2015) relates to the organized impact of fans on decisions made by the various stakeholders (i.e., club owners, CEOs, managers, and even the players), aimed at creating meaningful positive changes in team performance and results (Heere & James, 2007). Fans may even demand a say in the club's financial and personnel policies (Huettermann et al., 2019). Such activism may also take the form of "domination fights", not only against the fans of other teams, but also against their own club's stakeholders (Totten, 2015). Passive and/or aggressive organized protests and direct persecution of players, managers, and owners are means for impacting a club's decision-making, as if to say, "Our club, our rules!" (Brown, 2008).

Countering stadium-related violence has presented several challenges in terms of the relations among different agencies, such as allocating powers and responsibilities to the police and the security officers at the stadium. This situation is likely to be more aggravated when the public authorities perceive a low severity of football-related violence, resulting in a less stringent response by the state. Consequently, clubs seek the middle ground between disciplinary proceedings and seeking peaceful relations with fans through informal agreements. Divišová (2023) found that in many cases the ability of clubs to maintain public order in the stadiums depends on informal relations and practices, rather than formal regulations.

Beedholm Laursen (2019) suggests that it is important that enforcement authorities are able to differentiate between the intentions of different fan groups within the crowd and understand the driving force behind the behavior of fanatics, who are able to transform small-scale incidents into violent crowd disorder.

**Fan activism in Israel**

Lebed and Morgulev (2023) surveyed Israel Premier League (IPL) fans to demonstrate that fans are sometimes also "players" whose interactions with the club are characterized by play-like behaviors. These authors proposed that an individual being "in play" feels and behaves differently from an ordinary customer of large-scale events. Namely, the satisfaction and disappointment of sports fans is expressed within "play space" and through play tools. Consequently, normative and law-abiding members of society can sometimes transform into antisocial elements while being immersed in this play space of fandom.

Levental et al. (2021) reinforced this idea that sports fanhood goes beyond mere enjoyment of content and consumption by showing how football fans perform superstitious rituals at home in the morning hours of a match day, hoping that such behaviors will have an impact on the outcome. The interviewees in this study perceived individual routines carried out in private space as an authentic expression of their sacrifice for the team. Cohen (2017) surveyed attendees of prominent IPL football club home matches and highlighted the role of commitment to community (i.e., being a proud member of the community, love of living in the city, encouraging friends to move there, etc.) for the forging of strong team identification.

Tamir (2022) interviewed IPL fans and specified that fanhood develops gradually and typically begins before birth. Parents, primarily fathers, attribute great importance to the continuity of the family sports heritage and engage in various actions to perpetuate this heritage. Fandom grows in intensity and peaks when fans mature and become independent. Over time, a decline in fanhood intensity is evident, mainly due to the changing priorities of fans. Sports fandom is then revitalized through the parenthood stage, when fathers play the role of mentors in diverse fanhood settings.

Levental et al. (2016) focused on sports fans' use of online platforms, studying top-tier Israeli football club Hapoel Tel Aviv as a case study. They argued that becoming more active with online tools has a major impact on fan habits and how sports content is organized and shared. Online platforms give birth to an autonomous communities, removed from the team, where fan-produced content is no longer influenced by any management agenda. Instead, fan-run sites criticize the team, players, and owners and influence the agenda and public opinion by themselves. In this vein, Shuv-Ami and Toder-Alon (2022) suggested that not only does the level of team's aggression affects fan aggression, but in fact fan aggression also affects players, coaching staff, and management. Therefore, Shuv-Ami and Toder-Alon advocate that clubs should allocate resources to encourage the positive aspects of their fans' social behavior.

On the impact of online platforms, Ben Shalom et al. (2019) monitored the amount, timing, and hostility of traffic on social networks and reported that a build-up of tension three days before the game is correlated with the stadium violence of both fans and players. In respect to violence among Israeli football fans, Ben Porat (2016) stressed that fandom reflects the heavily polarized political situation of Israeli society in the form of ethnicity- and nationality-based frictions, which has often incited violence inside and outside the stadium. Reshef and Paltiel (1989) elaborated that Israeli sports are assimilated into the political-ideological framework, since parties appropriated and subsidized clubs as tools of partisan competition. Israeli sports became a metaphor for politics, and marginalized groups used sports loyalties to riot in support of and opposition to the political establishment (for more information on the geo-political context of sports in Israel see Galily, 2007; Kaufman, & Galily, 2009; Mizrahi et al., 2008; Nevo, 2000).

Evidently, fandom is a complex phenomenon that is comprised of a wide range of activities that could significantly impact a club. As such, this intricate yet necessary club-fan relationship raises several questions: Where is the line between fans' positive engagement and negative intervention? How and why does the club-fan synergy sometimes evolve into antagonism? What is defined as a club's success? How can clubs deal with negative manifestations of fandom? Longitudinal research studies often envelop fans as both the objects of the study and as the agents who provide the research data (e.g., Llopis-Goid, 2014; Wann et al, 2001). Others study fandom from the standpoint of sports' decision makers, such as club owners, CEOs, and managers (Davis, 2021; Huettermann et al, 2019).

The aim of this study is to improve the understanding of the dual club-fan relationship. To do so, in-depth interviews were conducted with prominent stakeholders in Israeli professional sports. At the end of the Discussion section, we attempt to interpret our findings through the *complexity approach,* which has proven to be a valid tool for understanding multifaceted dialectical relationships (see Cilliers, 2005; Dimitrov, 2005; Kelso & Engstrøm, 2006; Richardson, 2005).

## Methods

This qualitative study was conducted in line with Interpretive Phenomenological Analysis (IPA). The ob-

jective of phenomenological qualitative research is to accurately capture the way the phenomenon is experienced within its contextual setting (Giorgi & Giorgi, 2003). IPA offers researchers the most comprehensive means of comprehending the profound reflections behind the 'lived experiences' of research participants. Being a "participant-oriented" approach, IPA enables research participants to freely express themselves and their stories without any distortions. In IPA, the interpretation is rooted in the text, but the approach incorporates a questioning method to comprehend the participants' experiences and interactions. It does not rely solely on external theories, but also considers the perspectives from outside the participants. As a result, IPA involves a dual hermeneutic process: it seeks to understand the stories as experienced by the participants while also interpreting and understanding the broader interaction and context in which the participants are involved. This two-fold approach allows for a comprehensive exploration of the participants' lived experiences and the contextual factors that shape their narratives (Smith & Osborn, 2003). IPA proves to be a valuable method for capturing the essence of participants' experiences and promoting genuine understanding in qualitative research (Alase, 2017).

We used semi-structured, in-depth interviews. This research method was chosen for a number of reasons, as suggested by Coombes et al. (2009) and others. First, the flexibility of the interviewing process encourages both the interviewer and the participant to explore issues at depth, while reflecting on experiences, beliefs, and feelings. Interviewers can ask for clarifications and probe for further responses if needed. In addition, as the participants are chosen thanks to their direct knowledge and experience in the researched subject, they can share "inside information" with the researcher. Therefore, the use of direct quotes in this article is a powerful means for reinforcing the validity of the research analysis. Next, in-depth interviews are especially beneficial when investigating relatively unknown topics, where predefining relevant and adequate questions (as with a questionnaire) is more difficult. Finally, the ensured confidentiality and informal atmosphere of an interview could help interviewees be more willing to open up and discuss their views in detail.

**Participants**

Eight participants took part in the interviews for this study (pseudonyms are used throughout this study to maintain their privacy) – two former managers (i.e., head coaches) of IPL clubs (V.H. and N.L.); an active manager of an IPL club and former captain of the Israel national team (N.K.); an active manager of an IPL club (O.U.); three former CEOs of IPL clubs (R.S., N.I., and E.D.); and one current owner of an Israel Basketball Super League club (S.M.).

The interviewees represent three key levels of club decision-making (managers, CEOs, and owners) in football and basketball, which are the most professional and popular sports in Israel. In line with the recommendations of Creswell and Creswell (2017), the initial recruitment was based on the personal acquaintance of interviewers with the interviewees and their specific background to obtain a broad understanding of stakeholders' views.

**Interviews**

In-person interviews were conducted with the participants, each lasting 30–60 minutes. The interviews were recorded and transcribed verbatim. The following three questions were presented as part of the semi-structured interviews: (1) How would you describe a healthy relationship between fans and the club? (2) Can you give an example of a disruption between fans and the club? (3) Should fan involvement be fostered? The study was approved by the Ethical Review Board of the affiliated academic institution of one of the authors. Prior to the interviews, the participants signed an informed written consent form. After being transcribed, the interviews were analyzed by two of the authors to identify main recurring themes.

**Rigor and trustworthiness**

Trustworthiness of the study was established using the techniques to enhance credibility, dependability and confirmability, as suggested by others (Korstjens & Moser, 2018; Pandey & Patnaik, 2014): (a) credibility was obtained using critical friends procedure and member reflections (McGannon et al., 2021; Smith & McGannon, 2018), and (b) dependability and confirmability were obtained using an audit trail with thick description, which enable the reader to study the transparency of the research path (Tracy, 2010).

# Results

The eight interviews conducted in this study yielded a 48-page transcript (double-spaced) in Hebrew[1]. Prior to expanding on the themes that emerged in this study, it is important to note that a *mutual dependency* was clearly seen in the texts, comprised of the following two categories: (1) fans who tend to intervene, cause trouble, are disloyal, and are over-involved (i.e., dysfunctional fans); and (2) supporters, fans, and followers who are loyal (from slightly to extremely loyal) and who create a positive spectatorship environment.

[1] English translations tend to be about 40% longer than the original Hebrew texts.

When asked about the most desirable and suitable club-fan relationship, most interviewees offered general responses, such as "It would be worth finding a balance between the fans' desires and the entire range of organized sports activities," or "The trick is finding a balance." A few general suggestions for doing so were offered by the interviewees: "It's important to conduct regular dialogs with fans from time to time," or "Fans should be helped with ticket purchasing and they should also be helped with logistical aspects, such as transport to games or clearly marked directions, or even arranging meetings and events [for them] at the club."

Based on the input received through the interviews, it is the first category of fans that should receive most attention, that is, the dysfunctional over-involved fans. Indeed, this was indicated in all eight interviews and addressed through a range of behaviors, from disloyal behavior to extreme cases of violence. As such, this became the focus of our analysis. Our generalizations show that fans were perceived as (1) a hierarchical organization that operates in an organized manner, with agendas, economic and substantive goals, and even an ideology; (2) those who ultimately determine the course (destiny) of the club and its stakeholders; (3) people who are involved on a daily basis, at the physical level, attend training sessions, maintain relationships with officials, and develop relationships with players, CEOs, managers, and even club owners; (4) fans who do not necessarily represent the majority opinion, yet consider themselves "owners"; and (5) fans who would not hesitate to fire a certain player or manager if their performance is perceived as unsatisfactory.

Despite their being a minority, their potential damage of such group is vast. As such, owners and CEOs, as well as managers and players, must be equipped with a well-defined set of principles and guidelines for preventing this "volcano" from erupting. N.K. highlights this issue in the following quote:

> In the past, we had decided to remove certain players from the team, but the fans would not accept our decision. This so-called hardcore [of fans] was very disturbed [by our decision] so they hurt the team in a very overt and fearless way, without any apprehension whatsoever. They disrupted training sessions and used profane language towards the players during warm-ups. They didn't care about the team. They perceived their protest as a project… Later, however, during the season, when the team played three games in the [European] Champions League, fans bought 25,000 subscriptions for these games. This was very, very moving. Twenty-five thousand people bought tickets for three Champions League games, expressing their complete support for the team, despite the 2000–3000 minority of fans who continued to protest.

As both the support and the disruptive actions of fans have an impact on the club and on the players, sports decision-makers face a range of challenges. For example: Which group of fans should be contacted when necessary? To what extent should their involvement be permitted? How should radical and violent behaviors be combatted? Should the club succumb to the pressures of dissatisfied fans from time to time?

The following four main themes emerged from the interviews conducted in this study: (1) Sports stakeholders' attitudes towards their clubs' relationship with dysfunctional fans; (2) the impact of dysfunctional fans on sports stakeholders' views; (3) the impact of dysfunctional fans on the club's decision-making processes; and (4) stakeholders' proactive interventions regarding the activities of dysfunctional fans.

**Theme 1: Sports stakeholders' attitudes towards their clubs' relationship with dysfunctional fans**

This theme, which included negative feelings and experiences (such as sadness, disappointment, and frustration), was reflected in the interviews as a rather overarching issue. Prior to analyzing the verbal data, we would like to address the tone of speech that was used by the interviewees during the interviews. Naturally, interviews enable participants to describe behaviors and express their thoughts and feelings (Coombes et al., 2009). Yet they also contain non-verbal messages, especially when discussing sensitive topics. While analysis of non-verbal messages was not within the scope of this current study, we could not overlook the fact whereby most interviewees were imbued with a tone of speech that expressed sadness, disappointment, and frustration. In this sense, a fit was seen between the verbal content of the matter at hand and the emotional messages that were conveyed through the interviewees' tone of speech. Some examples of messages that were delivered with sadness, disappointment, frustration, and even fear:

> *"We were required to appoint a new manager; however, the fans felt that the chosen candidate lacked competence. The morning after announcing the manager to the fans, I awoke to a flood of threatening messages on my mobile phone—threats directed at me, my life, and my family. These were violent threats. The impact of such threats on the team owner and the managerial staff cannot be overstated. Consequently, that manager was not appointed, and a less suitable replacement, aligned with the fans' ideology, was chosen instead."*

> *"A billionaire led the team for several years, during which the club achieved remarkable success. In one particular year when the achievements were not at the top of the league, the fans confronted him in his*

*office, and he promptly disassociated himself from the club. Subsequently, less qualified individuals took his place."* (N.L.)

*"One of the most potent influences is when the arrows are directed towards the manager – it alleviates the pressure from the players. This means that players are more comfortable when the blame is on the manager. They receive fewer complaints. Players who play less or are less valued – they have no issue in voicing stories about the quality of training, quality of meetings, or the manager's method in the team. This implies that such behavior from the audience undermines the manager's authority. It simply weakens him within the system. This is the most significant disturbance because if a manager knew that the owner wouldn't budge despite those protests, if he knew that the players stood completely behind him despite those protests and even being escorted out with a police escort – he could continue to lead the team if he's strong enough in character and can stand by these things. But as soon as these cracks begin within the team and in the players' relationship with him, and the authority he projects towards the players – then it starts to falter and impact less favourably."* (V.H.)

Moreover, although the interviewees were asked about both negative and positive aspects of fan behavior, their remarks mainly revolved around harsh and painful examples. For example:

*"You have to put things into perspective. The same fans who carry you on their shoulders and pay you compliments are the first to shout profanities at you and yell, 'go home!' when the team doesn't perform well."* (N.L.).

Another example is related to the disappointment from the nationalistically colored attitude of dysfunctional fans towards players:

*"They were so ungracious. Usually, such criticism is seen in retrospect, with them hating a certain player. There was a guy (S.A.S.) who played throughout the championship season. The crowd was extremely bitter towards him."* (R.S.)

**Theme 2: The impact of dysfunctional fans on sports stakeholders' views.**

The interviews showed that fan intervention occurs at almost all levels of the club, with owners, CEOs, and managers receiving the brunt of the fans' interference and criticism. This can be seen in the following examples from an interview with a CEO:

*...Then contact is made with the spectators [and a popular player who was fired from the team]. With the hardcore fans who call themselves 'ultras'... Such groups emerged for Maccabi [...]... They were the first. There was one guy, Head of the 'Ohadim-[...]' [fan club] called [...]. He wrote nicely, you could tell that he's well-educated. But during games, he sits in Gate [...] together with the 'baboons'. The gate where the violence began. A group of fans who became violent towards L.H. [the owner] and N. K. [the manager] who was employed by L.H. There was awful violence.* (R.S.)

A similar message can be seen in the following example, also given by a CEO:

*... We had to appoint a [new] manager because... you can have an organization that works amazingly well, but not without a good manager who knows how to retain players and promote them... [The new manager] somehow attacked the fans... One night, when I was asleep, I received thousands of threatening messages... I can't describe them any other way than as violent threats.* (N.I.)

One manager also conveyed similar feelings:

*The unstable attitude of the fans... depends on the results. [I say this] from the perspective of a manager who has coached teams for several consecutive years, and who has experienced good times and bad times. It has an emotional effect [on you]. It hurts, and you find asking yourself, why do I need it? ... So yes, it hurts!* (O.U.)

*I can inform you that in specific scenarios, this is also an element of the game plan. It implies that when playing against a team and recognizing the existing pressure, if, within a short time frame, they fail to score, you convey to your players, as part of motivation, that by executing certain tactics, the audience will start jeering and the opposing team's players will be under pressure, ultimately benefiting us. It is undeniably a strategy taken into consideration.* (R.S.)

**Theme 3: The impact of dysfunctional fans on the club's**

In general, all interviewees mentioned the active pressure on sports stakeholders when the team is going through a bad patch.

*Things start to have a greater impact during bad times, especially in large clubs... I can recall two incidences where I had to be escorted out of the training complex by police vehicles... during bad times when the team*

*was not performing well. The fans demand that you resign, they do things. This is obviously very stressful. It creates stress within the system, stress among the coaching staff, stress among the players. It happens to you, just like it happens to the players. It's mainly directed towards the leading players and owners, which means that the entire system is under pressure from the crowd.* (N.L.)

However, two very different opinions emerged from this common viewpoint: "Yes, they really do!" and "It's not like that at all. They don't affect my decision-making in any way!" The first type of response was expressed by former stakeholders who were not in an active position at the time of the interviews. For example, "We had an owner who was greatly influenced by what the [dysfunctional] fans said… The negotiations [with a prospective candidate for the position of team manager] were somehow leaked to the fans, and then the owner seemed to feel great pressure to listen to their opinions." (N.I.)

Such negative feelings towards the interference of disloyal and over-involved fans can be seen in dramatic expressions, such as:

*There was something very fake about disqualifying the manager that we wanted and hiring another person who suited them [the fans] better. An ideology that is only convenient when everything goes well for them. But when it doesn't suit them, the ideology disappears… That was the case and I think that it [eventually] led to the collapse of the club. Any decision based on fan pressure is harmful.* (N.I.)

N.L. also expressed similar experiences:

*These things [activities of different groups of fans who "manage" the football arena without really understanding it] seep into the system from the crowd, i.e., into professional teams (who may or may not be affected by this) or team owners (who may or may not be affected by this). I know that there are some team owners who are influenced by all sorts of people who provide them with data (correct or incorrect) and emphasize certain things. These things have an impact.* (N.L.)

Similar experiences were also voiced by V.H.:

*Nowadays, if you lose three games, [you hear:] "Go home!" They're waiting for you by the gate, shouting: "If you come to tomorrow's training session, you're a dead man". Those crazy fans who write the script for you. That's why in the tenth cycle of the major league championship, ten [managers] were fired. It's unbelievable. There was one manager who was fired even before the beginning of the season. It's absurd. Because of the fans. Because of their impact. Their pressure. Owners are afraid of losing their fans, so they fire the manager.*

The powerful impact of dysfunctional fans on decision-making in elite clubs in Israel was also indirectly expressed in some interviews. For example:

*Fans are a dramatic issue, for better or for worse. Large clubs around the world understand this. I think that it's different in American sports. I don't know how relevant your research will be to the Yankees. I'm sure fans there don't get to decide what happens.* (N.I.)

Interestingly, unlike interviewees who no longer held active positions, those who were employed in the field at the time of the interviews tended to negate any noticeable influence of fans on the club's decision-making processes. For example:

*I've rarely seen an organization [of fans] that is really, really involved. Owners are as cautious of this as they are of fire. They don't let them get a foot in the door, not even the slightest opening, because that causes problems. I'm not aware of any [fan] involvement in the goings-on of the club and the team. The only involvement that can be seen may be personal relationships between fans and the team's players and manager – through social media.* (N.K.)

An additional example along the same lines was conveyed by E.D.:

*When I was CEO of [...] football club, there was a case regarding a leading player. The manager didn't want the player to continue playing for the team, so he made a professional decision. His decision was backed by the board… [But then a large group of fans] tried to influence this decision with all their might... We did everything we could to try to avoid the fans' influence. For us, the club comes first. No player is above the club. But a very stubborn war was held, a type of blockade that couldn't work.*

Finally, the message conveyed by S.M. presented similar thoughts:

*You need to be attentive, show them that you're listening to what they have to say, but don't let them run the club. Absolutely not. Don't accept things that are based on whims. There are also groups of those who call themselves "Ultras"... You have to know how to*

*maintain balance and restraint. The key is knowing how to maneuver, without succumbing to such and such whims.*

Semantically, these three statements are of a declarative nature, addressing the efforts that are made by the club, or the necessity of the club-fan relationship; yet they do not explicitly say, "The fans do not influence the club's decisions."

**Theme 4: Stakeholders' proactive interventions regarding the dysfunctional activities of fans**

The fourth and final theme found in this study relates to proactive relations, indicated in statements that reflect the initiation of club-fan dynamics – both supportive and destructive. The former is expressed through periodic dialog, special ticket sales, logistical assistance for fan groups, and assigning a contact person to liaise between the fans and the club. This was seen in the input provided by V.H.:

*A "fan officer" is responsible for the fans. He initiates meetings with them as a symbol of appreciation. It's not mandatory, but if you want to be a self-respecting club, then you should have one. Many times, for example, the club will ask its fans to refrain from using racist slogans – in an attempt to encourage principles of fair play. The [club's] relationship with the fans is very important. Someone who can be contacted via email and telephone, so that anyone can talk to him. That's his job.*

The second type of proactive relations focuses on significantly decreasing fan violence, as discussed by N.I.:

*As soon as an organization [of fans] starts to resemble the violent branch of a terrorist organization or a small mafia organization, and you're not sure what it wants or why it's behaving violently towards you, you must take action to dismantle it. I don't know if I would want [to start] a war, but I think if someone behaved violently [towards me], I would take them to court… There are sophisticated means that won't hurt you personally: lawsuits, private detective agencies, and even companies that specialize in dismantling this kind of organization.*

Another example is given by N.L:

*I have consistently stated that the fans are an integral part of the club. I recommended to the owner the importance of maintaining a connection and seriously considering the fans' demands and opinions, emphasizing that these cannot be disregarded. I proposed ongoing communication with delegates representing the majority of the fans, advocating that the club should not engage with individuals representing smaller factions. Furthermore, I suggested the inclusion of family and children's fan sections within the stands.*

Finally, S.M. notes the need for conducting permanent, ongoing dialog with fans:

*As I see it, the perfect relationship between the club and the fans is [created] through frequent conversations. Being attentive to the fans' needs and wishes, listening to what they have to say... every month or so… To educate the fans so that they don't cause the club to incur penalties because of their behavior.*

On the other hand, he said:

*As an owner, it is imperative that we strategize ways to disband the Ultras. This is an exceedingly violent organization that must reform its behavior or be disbanded entirely.*

## Discussion

This qualitative study strives to analyze club-fan relationship from the stakeholders' point-of-view. Our findings demonstrate that stakeholders are influenced by fans' conduct, both positive and negative – on an *emotional*, *personal*, *cognitional*, and *behavioral* level. The evident positive-negative club-fan reciprocity corresponds with the previous literature and also extends the existing knowledge. The current findings are especially important in the quest to resolve overt and covert conflicts with aggressive "our-club-our-rules" fans, which could significantly undermine the activity of sports clubs.

Combined, the emerging themes convey a rather pessimistic landscape of relationships, in which the stakeholders are often left to deal with the challenges and disturbances created by dysfunctional (i.e., disloyal and over-involved) fans who frequently disrupt the club's control and even the integrity of the system. Indeed, this reciprocal relationship and general dependence of the system on fans is expressed in the difficulty stakeholders have in ignoring the interventions of aggressive fans when making managerial decisions. And the greater the aggressiveness of the intervention, the greater the problem.

In this vein, the findings seen in this study could be interpreted from two discrete yet complementary viewpoints: the local aspect and the universal one. From an Israeli standpoint, this rather distressing situation could be viewed as a local cultural phenomenon. Studies show that

Israeli football is characterized by destructive aggression and violence, exhibited by fans and ultras on-pitch and off-pitch alike (e.g., Ben Porat, 2016; Ben Shalom et al, 2019). Scholars have also addressed the high levels of aggression displayed by Israeli football professionals, namely, how the players relate to their opponents, the managers' aggression towards the referees, and insufficient managerial efforts to put a stop to such aggression (Shuv-Ami & Toder-Alon, 2022).

The sports aggression that is typical of dysfunctional Israeli fans and which has a significant impact on sports clubs could be related to each of the following sociological-cultural aspects:

1. High levels of aggression in Israeli society that are associated with the permanent state of stress across the country. This stems from the history of the Jewish People, who were subjected to persecution and threats over the centuries (Landau & Beit-Hallahmi, 1983), combined with the country's permanent embattled state with neighboring countries and within Israel itself (Efrat-Treister & Rafaeli, 2011; Landau, 2003; Nuttman-Shwartz, & Weinberg, 2008). Israelis seem to live in a continuous state of anxiety and stress, which is further exasperated by the increasingly dense population, which has resulted in overpopulated educational institutions (see Selah-Shayovits, 2004), hospitals, and emergency departments, as well as heavily congested roads (see Granek et al, 2018; Landau & Raveh, 1987; van Londen et al, 1990).
2. Ideological views on sports, ranging from mere tension to outright hatred that stem from irreconcilable political differences between parties and people. This can be seen specifically in the targeted funding of politically identified sports societies, and through the mutual aggression of teams and fans – a situation that has been going on for decades.
3. The sharp differences between distinct subgroups of Israeli society (ethnic, religious, or cultural) in the way violence is treated, accepted, or even encouraged (see Carmi-Iluz et al, 2005; Efrat-Treister & Rafaeli, 2011; Galin & Avraham, 2009).

In the current study, the interviewees expressed their frustration regarding their relationship with dysfunctional fans and their impact on decision-making processes and outcomes in football and basketball clubs in Israel. These findings are in line with studies from outside Israel, demonstrating that this phenomenon is universal rather than local (albeit to a different extent in different countries). This phenomenon, therefore, should be addressed as a generalized global one that is in dire need of effective and applicable solutions. As such, we need to reformulate how we discuss the findings of this study. Instead of seeking answers about how to deal with dysfunctional fans, we need to strive to understand why managing sports clubs is so very complicated. The first step in doing so is the need to redefine the violent, "burning down the club" group of fans. They should be excluded from the category of supporters or consumers (as suggested by Woratschek et al., 2014, for example) – classifying them instead as a new category. They could perhaps be called the "small party" or "partisans" (Dixon, 2001, 2015; Russel, 2012) as they muscle their way to take over the entire club (i.e., "big party").

Consequently, we will now address the conflict between "small" and "big" parties through the complexity approach (Bar-Yam, 1997; Dimitrov, 2005; Richardson, 2005; Wolfram, 2002), which has been widely used in understanding socio-psychological and managerial processes in team sports over the past 20 years (see Balague et al., 2013; Davids et al., 2013; Lebed, 2006). In the case of club-fan relationships, large and small parties can be represented as an interaction between two complex systems. When theoretically analyzing this conflict or interaction, three prominent differences emerge, which largely determine their level of organization and manageability, as well as how they attempt to achieve their goals.

1. *The intrinsic dynamics* of these two systems differ from one another. In the sports context, the small system of dysfunctional fans has a relatively simple network and a one-level organization. It also self-organizes and adapts to changes relatively quickly. The large system of the sports club, on the other hand, is a five-level complex system (Lebed & Bar-Eli, 2013). While the lowest level relates to athletes' kinesiological and psycho-biological abilities, the higher levels envelop the athletes, competing teams, and coaching staff. Finally, the highest level consists of the club's stakeholders (such as managers, CEOs, owners, and board members). The survival of the club as a multi-level complex system is an intricate challenge. Theoretically, if all five levels are interconnected and organized, then each level should structurally encompass the levels below it and absorb their problematic complexity, such as free will, information entropy, and unpredictability (Lebed, 2017).
2. *The degree of freedom* between these two systems also differs, especially in relation to counteractions and how they express themselves. Disloyal, over-involved fans, who comprise the smaller party, do not hesitate to use their aggressive voices, often overstepping the borders of what is considered civil conflict management. In extreme

cases, they will not hesitate to "burn down the club", in both a literal and metaphorical sense. Stakeholders, on the other hand, are expected to act within the boundaries of institutional norms and structures.

3. *The targeted audiences* of the two parties also differ greatly. Organized groups of dysfunctional fans choose their "victims" from any level of the club's hierarchy, embarking on focused attacks that could even harm a person's health and safety. Sports organizations, on the other hand, strive to behave in a positive and constructive manner towards their community and consumers, while adhering to an ethical code, even when dealing with dysfunctional fans who try to undermine the system.

Complex systems may attempt to adapt to the menacing environment by employing a range of suitable reactions (e.g., Davids et al., 2013) and proactive initiatives (e.g., Lebed, 2017), or by simply ignoring the interference. While the two conflicting systems at hand claim to share the same positive motivation (i.e., club success), the smaller undesirable one has three significant advantages: (a) a simpler structure that enables better and faster self-organization; (b) morally unlimited means of conducting the conflict; and (c) personification of aggression or violence. This situation is further aggravated by the fact that although the small system declares the same goals as the large one, it often is not obligated to be held accountable for its deeds. Moreover, by employing "partisan" strategies, the aggressively competing small system creates entropy and uncertainty that cannot be absorbed or overcome by any of the five levels of the large system. In other words, this menacing and perturbing small system is not and cannot be a part of the larger system.

In the light of our findings, this fundamental weakness can be partially resolved by sports club authorities using "carrots and sticks". One such solution that seems to work well with loyal supporters is including them in ongoing discourse through creation of official fans' representatives council and even inclusion on the board of directors (see Bee and Havitz, 2010; Brown and Walsh, 2000; Taylor, 1992). Such practices are in line with S.M's. notions of the essential ability to balance and maneuver through the relationship with marginal groups of fans. According to Beedholm Laursen (2019), the dialog strategy is an anticipatory strategy that ideally has the potential to monitor fan crowds in a friendly atmosphere, prevent conflicts from escalating and/or reduces the magnitude of an escalating conflict. In this vein, Divišová (2023) argues that clubs are sometimes able to reach agreements with the fans when they trade concessions in security measures in exchange for fans regulating their own behavior in the stands.

However, in the occasional case of severe aggression, the large disrupted system seems to have only two feasible solutions: flight or fight. Yet neither of these solutions are adequate, as seen in some extreme cases, where radical interferences have resulted in stakeholders experiencing heart attacks, athletes bursting into tears, and radical dysfunctional fans being criminally prosecuted for their actions. This was also sensed through the pessimistic tone and bitter emotions of our interviewees, expressed in relation to their interactions with dysfunctional fans. Frustration of the clubs' stakeholders was also evident in their frequent use of the term "should be" rather than "is" during the interviews.

In biology various complex systems co-exist in symbiosis, as their activities complement each other in facilitating reproduction and survival. In social systems, however, co-existence through symbiosis is more problematic. Even when the two systems successfully utilize each other's activities for their own benefit, complex social systems tend to transform into support-conflict relationships. Such dialectical relations (Lebed, 2022) emphasize the need for developing novel analytical tools that could provide managers with predictive models of unique organizational risks. Adapting the complex systems approach could offer a fruitful framework for studying the dynamic self-organization of sports clubs that are subject to ongoing aggressive disruptions.

# Conclusion

Regarding groups of dysfunctional fans, our findings indicate that stakeholders should be aware of and consider ways to minimize the inevitable extrinsic interference upon ongoing operations of the club. The current study advances understanding of the intricate club-fan dynamics by providing a unique glimpse into prominent stakeholders' experiences, perceptions, feelings, and ideas. All in all, it seems that one possible solution to club-fan frictions could stem from involving a larger group of supporting spectators and their families in a wide range of face-to-face and online activities where marginal parties of aggressive "troublemakers" may simply become less prominent over time.

**Ethics approval and informed consent**

All procedures performed in the study were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. Informed consent was obtained from all individual participants involved in the study.

**Competing interests**

The authors declare no competing interest.

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# European Cities of Sport as a Strategic Policy for Local Development of Sports: A Perspective from Sports Management in the Last Decade

**Authors' contribution:**

A) conception and design of the study
B) acquisition of data
C) analysis and interpretation of data
D) manuscript preparation
E) obtaining funding

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## Abstract

European sports policies have focused on the implementation of public instruments and policy measures, aiming to encourage EU member states to promote and improve sports habits, while simultaneously tackling high levels of sedentary lifestyle among Europeans. Despite these efforts, data concerning the various measures is quite limited, making it impossible to assess the real impact on the population, particularly in the case of the European Cities of Sport. This award has been held since 2007 and has already distinguished 193 cities; however, current knowledge does not allow researchers to theorise about its multiple impacts as a strategic policy instrument for the local development of sport in Europe, thus constituting a gap within sports management research. In order to further this knowledge, we explored European reality over a decade (2013–2022), analysing nine awards of Portuguese cities. We employed qualitative methods for documentary analysis of public information and descriptive statistics for data analysis. The results show that over 2 600 multidisciplinary events were organised, among which 402 had an international character (15%), an average of 50 sports disciplines per edition, 359 events related to culture and education, and involved over 1 000 000 participants, with an overall investment of over €39 million. This research now allows a theoretical-scientific and operational referential pattern of key indicators to be established for future European ECS applications, while demonstrating an encouraging relationship, from a sports perspective and economically, between public investment made and estimated return, thus contributing to better political decisions and to the positive implications of increasing public investment in sport.

**Keywords:** Europe, sports management, physical activity participation, development through sport, sports participation

## Introduction

The influence of sport on modern societies continues to be a topic of high interest and multidisciplinary understanding for science, with its value and importance recognised at various levels worldwide (Puig, 2016; Warburton & Bredin, 2017; Biernat et al., 2020; Koronios et al., 2021a; Glebova et al., 2022; Teixeira et al., 2022). The research produced in recent decades makes it possible to identify with greater clarity the organisation and structure of sport in a wide range of geographical contexts (Teixeira & Ribeiro, 2016; Skinner & Engelberg, 2017; Glebova et al., 2022: Hammerschmidt et al., 2023), while at the same time understanding and deepening knowledge about the different economic, social, cultural, health and well-being benefits of sport (Parra-Rizo & Sanchis-Soler, 2020; Annesi et al., 2023; Lenka & Behura, 2023).

In the field of health and well-being, scientific developments in the last two decades have made it possible to identify the various benefits of regular sports practice for human beings, regardless of gender, age, physical condition, disease and/or pathology (Falck et al., 2019; Biernat & Piatkowska, 2020b; Arriaga et al., 2022), in terms of improving physical condition, rehabilitation and combating serious diseases such as diabetes, obesity and heart problems (Herrera & Vargas, 2019; Chan et al., 2019).

Based on the existing scientific knowledge, as well as through the mass dissemination of information concerning the various health benefits of sport, we can affirm that people today are better informed about the importance of sport in the adoption of healthier habits and behaviours (Román-Mata et al., 2020), which is reflected in the progressive growth, still at worrying low levels, of the global population that dedicates part of its time to leisure and recreational sport (Pogrmilovic et al., 2020; Stenling & Fahlén, 2022). However, this scenario still represents one of the great paradoxes of the twenty-first century in the field of public sport policies, since while scientific evidence is peremptory in demonstrating the enormous benefits of sport, we continue to have high rates of sedentary lifestyle affecting different age groups of the global population (Arriaga et al., 2022).

The last two decades in Europe in particular have been ambitious from a political and governmental point of view in the field of sports promotion, where several initiatives and instruments have taken shape and continue to be applied in the development of sport, with significant merit and political success (Sesinando et al., 2022; Moradi et al., 2023). However, there is a clear lack of in-depth evaluations of the instruments and measures adopted in recent years in practical terms, i.e., a technical-scientific reflection on the programmes developed, the results obtained and the possibility of assessing any sporting legacies resulting from specific initiatives (Bańbuła, 2021; Mestre et al., 2023).

This is the crux of the problem around understanding the political instrument called "European Cities of Sport". Despite being one of the most historic and important awards for merit and local recognition in the development of sport, there is not enough information about its various impacts and actual results in each of the EU countries that have received the award since 2007 (ACES Europe, 2023).

This observation is common to the whole of Europe in terms of (almost non-existent) scientific publication, making it impossible to consistently and rigorously assess its efficiency and full effectiveness as a public policy instrument for promoting and boosting sport, as well as its possible legacy among the population in terms of adopting healthier habits and behaviours (Matušíková et al., 2022).

ACES Europe awards several prizes in the field of sport every year, but it is the "European Cities of Sport" that most represent the ideal and true essence of public sports development policies based on the European premise of "Sport for All" without exception. However, we believe that the real value of this policy measure has not been recognised, and the lack of research interest demonstrates this reality.

Although the Eurobarometer for sport and physical activity monitors and observes the evolution of sporting activity and sedentary lifestyles in Europe, the same has not been verified in the evaluation of the main instruments and measures of public sports policy (Gelius et al., 2020). In other words, the characterisation and dissemination of some information is clearly insufficient and rigorous, making it impossible to affirm and validate the efficiency of the action and purpose of this award. This means that while the evaluation criteria for awarding this prize to European municipalities are well known, little information is actually made known about the impact and effects of the initiatives promoted that lead to this distinction.

The purpose of this research was to study and find answers in order to evaluate the Portuguese experience throughout its history of awards since 2013 (n=9), as well as to explore and establish its practical results in promoting local sporting activity and public engagement. Several indicators have been identified to reflect the final results of each edition according to sporting, economic and socio-cultural parameters. The research intends to contribute to the theoretical framework of sports management and public sports policies, while at the same time establishing a theoretical-scientific reference framework for future European applications, allowing political decision-makers to have a reference base for better political decisions in the field of sport.

## Literature Review

### Sport, Society, and Active Life: A European Perspective

In the European context, we can currently affirm that sport has, without doubt, become one of the pillars of the cohesion and development policies of all European countries (Breitbarth et al., 2019; Parrish, 2022; Moustakas, 2023).

The European Charter of Sport defines sport as "all forms of physical activity which, through occasional or organised participation, aim at expressing or improving physical fitness and mental well-being, forming social relationships or achieving results in competitions at all levels" (Hartmann-Tews, 2006; Teixeira et al., 2023b). With the signing of the Lisbon Treaty in 2007, the European Union became politically responsible for creating public policy measures and instruments that aim to develop physical activity and sport, by delegating and

making each member state responsible for these actions (Parrish, 2022).

On the other hand, developments in science and academic research have contributed to and promoted a worldwide understanding of the many multidisciplinary benefits of sport (Pietrzak & Tokarz, 2019; Biernat & Piatkowska, 2020a), sustaining many of the policy measures implemented over the last few years. Sport and its importance cover several dimensions, influencing the way of life in modern societies through its ability to cause profound changes in human habits and behaviours (Jeong et al., 2019; Antunes et al., 2020; De Bock et al., 2021).

Sport is, in fact, a unique tool in the adoption of healthier behaviours and habits, which not only translate into physical and motor improvements (Silva et al., 2020), but also in the improvement and stimulation of cognitive and psychological skills at any age and in any context (Malm et al., 2019). There are currently hundreds of scientific studies that demonstrate and enable us to understand the value of sport at the most diverse levels of society, making people more aware of themselves and their well-being (Piatkowska & Biernat, 2023), while practicing sport makes them more resilient and persistent, more positive and less pessimistic, as well as more active in society (Amado-Alonso et al., 2019; Koronios et al., 2020a).

From a European political action perspective, sport should and must be seen as an essential and irreplaceable aspect of human development (Lindsey & Darby, 2018). Therefore, it must be accessible to all and promoted, above all, by active, innovative and stimulating public policies (Christiansen et al., 2014; Volf et al., 2022), as recommended in the European Charter for Sport (1992, revised in 2001).

Despite the vast knowledge and scientific evidence, we continue to observe a paradox in European political action, as, to some extent, sport has been used as a way of obtaining international political recognition and notoriety (Teixeira et al., 2023c); on the other hand, however, we continue to witness a very clear public disinvestment reflected in an intermittency between levels of regular sports practice, and sedentary lifestyles and inactivity (Eime et al., 2019; Pogrmilovic et al., 2020; OECD/WHO 2023).

The aggregate data from the Eurobarometer 2022 for physical activity and sport shows sedentary lifestyles of 45.0% among the European population. However (Eurobarometer, 2022), this figure does not correctly express the different European realities, and requires a range of different policies and intervention measures to really promote positive changes in the population (Antunes et al., 2020).

In the particular case of Portugal (Table 1), and according to the most recent national data from the National Statistical Institute (INE, 2020), we can see that the levels of sedentary lifestyle are much higher, pointing out that in 2019 two-thirds of the population aged 15 or over did not practice any type of physical activity or sport (65.5%), with insignificant differences between 2014 and 2019 (Bento et al., 2014).

**Table 1.** Sporting habits of the Portuguese population (evolution and by gender from 2014 to 2019)

| Sporting Habits | Males (15+) | | Female (15+) | | Total | | Variance (2014 -2019) | |
|---|---|---|---|---|---|---|---|---|
| **Sports practice:** | **2014** | **2019** | **2014** | **2019** | **2014** | **2019** | **Males** | **Females** |
| Practitioners | 40.4% | 36.2% | 30.0% | 29.5% | 35.0% | 32.6% | -4.2% | -0.5% |
| Non-practitioners | 59.3% | 61.7% | 69.38% | 69.0% | 64.9% | 65.6% | +2.4% | -0.8% |
| No answer | 0.3% | 2.1% | 0.2% | 1.5% | 0.1% | 1.8% | +1.8% | +1.3% |
| **Sport practice/week:** | | | | | | | | |
| None | 59.3% | 61.7% | 69.8% | 69.0% | 64.9% | 65.6% | +2.4% | -0.8% |
| 1-2 days | 15.9% | 13.4% | 14.9% | 13.8% | 15.4% | 13.6% | -2.5% | -1.1% |
| 3-4 days | 11.8% | 11.4% | 7.1% | 8.7% | 9.3% | 9.9% | -0.4% | +1.6% |
| 5-6 days | 7.0% | 6.8% | 4.1% | 4.1% | 5.5% | 5.4% | -0.2% | 0.0% |
| 7 days | 5.7% | 4.6% | 3.9% | 2.9% | 4.8% | 3.7% | -1.1% | -1.0% |

Source: Sport in numbers *[Desporto em números],* National Institute of Statistics (INE), 2020.

This scenario clearly demonstrates the need to continue studying and developing different policies to develop sport and increase its regular practice in accordance with every European reality (Batista et al., 2012; Grix et al., 2021), not only aligned with the European ideal, but also widely recognised by the political establishment. Sport is highly susceptible to public disinvestment (Sesinando & Teixeira 2022; Ferguson et al., 2023), especially in periods of greater socio-economic difficulty (Figueira & Teixeira, 2021). Therefore, it is necessary to use innovative

instruments that encourage member states themselves to look for alternatives that guarantee the satisfaction of their populations (Moradi et al., 2023), whilst promoting more active and healthier European cities (Hafner et al., 2020).

**European Cities of Sport: A Strategic Instrument for the Local Development of Sports**

The historical and cultural context of sport in Europe has evolved gradually, especially in recent decades, and it is now politically and structurally recognised as one of the fundamental pillars of European society, despite the various asymmetries between member states (Christiansen et al., 2012; Teixeira, 2019).

From an early stage in its long history, the European community recognised the capacity and importance of sport in the well-being of European citizens (Gelius et al., 2020), as well as the need for it to be accessible to all without exception (Teixeira et al., 2023a). To achieve this, the EU assumed the political responsibility of promoting and encouraging sport through the creation of instruments and political action measures, as well as the definition of what would be the basic foundations of European sport, reflected in the European Charter of Sport (1992) and, subsequently, in the Treaty of Lisbon (2007) (Teixeira, 2009).

The definition of this inclusive and aggregating vision, which sought to include the entire population, enabled one of the greatest phases of local development in terms of promoting and boosting sport (Radicchi, 2013; Maguire, 2019), and the construction and/or renovation of sports venues and facilities using EU funds and support (García-Unanue et al., 2021; Sesinando et al., 2023). Countries that have historically been less developed, such as Portugal, have benefited greatly from access to funding and various forms of support that enabled new public sports policies to be established (Santos et al., 2021). At the same time, existing policies in line with European guidelines and standards have been strengthened (Fernandes et al., 2011; Parrish, 2022).

The European vision is based on the promotion and guarantee of public access to sport as a vehicle for improving both physical and mental living conditions in its various geographical regions (Teixeira et al., 2023d) as an aspect of collective well-being and social cohesion (Malm et al., 2019). In other words, national and European public investment must ensure that, as part of a modern society and through sport (Ramchandani et al., 2018), all citizens have access to the conditions necessary for regular physical activity and sport (Mutz et al., 2021; Magalhães et al., 2023).

In Portugal, over the years, we have progressed from public policies based mainly on supporting the federated practice of young people by helping the associative movement (Teixeira et al., 2023d), Olympic athletes and their preparation, as well as by offering a variety of public sports services, especially in athletics and swimming, to more extensive multidisciplinary intervention programmes (Fernandes et al., 2011).

These adjustments were due predominantly to the increased recognition of the importance of sport as an indicator of local development (González-García et al., 2023; Teixeira et al., 2023b; Ferguson et al., 2023), but mainly to scientific advances that have contributed greatly to widespread awareness of the long-term benefits of regular sports activity (Hosker et al., 2019; Kim et al., 2021). In this sense, and with greater citizen awareness, local authorities have expanded their intervention considerably to include programmes for different audiences and specific contexts, ranging from pre-school children to the elderly (Picamilho et al., 2021).

As previously mentioned, the several member states have different asymmetries, which are reflected in the specific needs of each population. Even within each country, we are faced with specific requirements and the need to act and intervene differently (Falck et al., 2019). However, in recent years, sport has become more popular in everyday life and lifestyles – as a competitive activity, as a preventative health activity, or as a leisure, recreational or educational activity (Blanco-García et al., 2021; Magalhães et al., 2023).

This vision and understanding of the need for innovation and adaptation in national and European policies to the emerging contexts and opportunities for intervention as a means of encouraging the growth of active population levels (Cunningham et al., 2020; Parrish, 2022), while recognising the merit of the political activity of local leaders has encouraged the creation of new local development policy instruments, such as the "European Cities of Sport" award and distinction (Matušíková et al., 2020).

First awarded in 2007, the "European Cities of Sport" award aims to recognise the commitment and merits of local sports development, in terms of the range of annual actions and activities for different groups, both nationally and internationally, as well as the quality and quantity of sports venues, among other characteristics (ACES Europe, 2023), which are reflected objectively in the sports offered and the encouragement to practice unique and distinctive sports disciplines (ACES Portugal, 2023).

Scientific research in the field of sport clearly shows the importance of developing sport associated with sporting events (Seguí-Urbaneja et al., 2022; Koronios et al., 2022; Teixeira et al., 2023a; Zourgani & Ait-Bihi, 2023), not only because of the growing interest and high participation rates (Dubinsky, 2019; Reis et al., 2023), but also because of their ability to capture the interest and curiosity of both active citizens and those who associate themselves only with specific causes, using sport as a form of social expression (Parra-Rizo & Sanchis-Soler, 2020; Reis et al., 2023; Bodin & Taks, 2023). This has, indeed,

become a focus for the local authorities, not only as organisers of a range of sporting events and activities, but also in supporting the organisation of events promoted by different groups (Sesinando et al., 2022).

However, in the context of the "European Cities of Sport", scientific evidence does not confirm the efficiency and effectiveness of this public policy instrument (López-Carril et al., 2019; Teixeira et al., 2022). The lack of conclusive indicators, as well as the poor transparency of political actions, makes it necessary to study in depth and on a regular basis one of the most important political instruments for recognizing local political activity in the field of sport (Silva et al., 2020).

# Methods

**Research Design and Participants**

The Association of European Capitals and Cities of Sport (ACES Europe) is a non-profit organization that aims to reward, first and foremost, the work carried out by the EU member states in the field of sport (ACES Europe, 2023). The main premise of this distinction is to promote and stimulate good practices and active public policy measures for the development of regular physical activity and multidisciplinary sports practice at various levels, recognizing the particular and unique character of the role and intervention of local authorities in society.

The distinction began in 2007, and the merit and recognition prize has been awarded to 193 European cities (including the 2023 distinctions, among which is the Portuguese city of Viana do Castelo) in a total of 30 countries. Portugal, which received its first distinction in 2013, is an example of exceptional regularity, receiving nine European Cities of Sport awards, as well as being a European Capital of Sport (Lisbon 2021).

Despite the acknowledgement of these distinctions, researchers are unable to assess their impact, mainly due to the scarcity of scientific knowledge on this topic, making it impossible to build a suitable theoretical framework. This a knowledge gap in the field of sports management that urgently needs to be developed and researched.

Having identified this problem, we undertook an exploratory analysis of several indicators (sports, economic and social) that would allow us to better understand this reality, while assessing its possible impacts and/or practical effects on the population, both in terms of their participation and involvement, as well as in terms of municipal public investment. In order to amplify the research and identify the main characteristics of a given reality in the European context, all Portuguese awards between 2013 and 2022 were considered – Guimarães 2013, Maia 2014, Loulé 2015, Setúbal 2016, Gondomar 2017, Braga 2018, Portimão 2019, Odivelas 2020 and Leiria 2022.

**Data Collection**

In the absence of scientific studies and/or technical-scientific reports in the context of the European Cities of Sport in Portugal, in order to make a rigorous analysis, it was necessary to explore the existing information on each particular edition, consulting official documents in the public domain concerning the applications and final reports on the respective awards, as well as information collected directly from the municipal sports services and official websites promoting the programme.

It was necessary to establish which types of documents would contain information at this level and, after an in-depth analysis based on the information available online and on direct contact with three municipal technicians, we identified five types of official documents that could be used: a) evaluation reports on specific activities; b) application files; c) final evaluation reports on activity programmes; d) institutional websites promoting the application, and e) municipal accounts reports.

After identifying these sources of information, it was necessary to confirm the existence of these documents, as well as their accessibility and detail. In general, the existing information was disaggregated, confirming not only the effective absence of public information available online, but also that some municipalities had not produced detailed information on their final results (e.g. Maia 2014).

Therefore, in accordance with the information available, we defined indicators that allowed an in-depth analysis and evaluation of the impact of the European Cities of Sport from different perspectives. Once the indicators were defined, we opted to first search for the different documents on the institutional websites of the municipalities themselves and the official websites of the applications. Then, with necessary information missing and/or in an incomplete form, we contacted ACES Portugal and ACES Europe in order to obtain more information. The main objective of these last two contacts was to discover more information, especially in terms of the number of participants, number of events and public investment.

Overall, we analysed seven final activity reports, nine application dossiers, 11 institutional and five application websites, 16 evaluation reports of specific activities and nine municipal accounts reports, as well as information obtained through direct contact with the sport services of the municipalities involved. The analysis was carried out in person and remotely, and was subsequently validated by the chief author, a specialist in public sports management. The information was collected between September 2022 and February 2023. No exclusion criteria were defined, as this was an exploratory approach and we wanted to gather as much information as possible. However, we decided that the documentary research should be previously validated or not dependent on the reliability of the data and its origin, i.e. institutional and non-institutional.

**Data Analysis**

Following the definition of the study sample, as well as the mapping of the available sources of information containing the necessary data to identify the main characteristics of the Portuguese applications and respective awards as European Cities of Sport, it was necessary to organize and analyse the data collected. Having previously defined the type of documentation to be consulted in the study design, we collected and processed the data using mixed methods. We used a qualitative and interpretative approach in the initial phase, based on technical documentary research, which identified relevant information on each specific issue.

After this analysis and identification, the data were organised into categories in order to distinguish the different dimensions of the study. The following study variables were defined: a) number of sports events held; b) character of the events (national/international); c) number of cultural and training events; d) number of sport disciplines involved; e) number of participants involved; f) number of volunteers involved; g) number of ambassadors of the applications; h) public investment per municipality, resident, participant and event; i) estimated financial investment/return ratio per municipality; and, j) digital reach and engagement.

In other words, this research aimed to distinguish the information collected into four dimensions: a component related to the entire organizational environment (participation and involvement characteristics); a second component related to the municipal public investment made in each edition; a third component related to the comparison between investment made and estimated return; and a component related to the interaction and dissemination of information online about each particular edition.

In the quantitative approach, once the data had been grouped, we used descriptive statistics techniques. Considering the purpose of the study, as well as the origin and specificity of the information collected, measures of central tendency were used – mean, median, range, standard deviation, minimum and maximum, as well as simple and accumulated absolute frequencies. The statistical analysis was carried out using Microsoft Excel 365 16.0 version, which was also used to construct the tables and distribute the data.

# Results

In Portugal, since its creation in 2007, the distinction of European City of Sport has been awarded to nine municipalities. It should be noted that the Lisbon edition of the European Capital of Sport was celebrated in 2021, which is why no other Portuguese city has been distinguished with the European Cities of Sport award. The analysis carried out allowed the identification of several indicators to assess the socio-economic and sporting impact of the ECS in the Portuguese context.

**Events, Sports, Participants, Volunteers and ECS Ambassadors in Portugal**

Table 2 identifies the number of sporting events held in each of the applications for the European Cities of Sport, as well as the number of sports disciplines, number of

**Table 2.** Number of ECS events, sports, participants, volunteers and ambassadors in Portugal

| Editions | Events | Sports | Participants | Volunteers | Ambassadors |
|---|---|---|---|---|---|
| 2013 Guimarães | 101 (3.8%) | 50 (12.3%) | 37 000 (3.4%) | 1 425 (8.5%) | 13 (6.8%) |
| 2014 Maia | 250 (9.4%) | 24 (5.9%) | 120 000 (11.0%) | - (0.0%) | - (0.0%) |
| 2015 Loulé | 86 (3.2%) | 48 (11.8%) | 21 594 (2.0%) | 467 (2.8%) | 24 (12.5%) |
| 2016 Setúbal | 127 (4.8%) | 52 (12.8%) | 300 000 (27.4%) | 1 493 (8.9%) | 26 (13.5%) |
| 2017 Gondomar | 391 (14.7%) | 53 (13.0%) | 78 404 (7.2%) | 2 931 (17.4%) | 42 (21.9%) |
| 2018 Braga | 612 (23.0%) | 80 (19.7%) | 131 313 (12.0%) | 261 (1.5%) | 3 (1.6%) |
| 2019 Portimão | 706 (26.6%) | 60 (14.7%) | 131 860 (12.0%) | 2 183 (13.0%) | 15 (7.8%) |
| 2020 Odivelas | 85 (3.2%) | - (0.0%) | 56 895 (5.2%) | 173 (1.0%) | 64 (33.3%) |
| 2022 Leiria | 300 (11.3%) | 40 (9.8%) | 217 502 (19.9%) | 7 294 (47.0%) | 5 (2.6%) |
| **Total (n=9)** | **2 658 (100.0%)** | **[- (0,0%)]** | **1 094 568 (100.0%)** | **16 857 (100.0%)** | **192 (100.0%)** |
| Mean | 295 | 50 | 121 618 | 2 107 | 24 |
| Median | 250 | 51 | 120 000 | 1 459 | 19 |
| Standard deviation | 233.0 | 15,9 | 89 747.5 | 2 541.1 | 20.4 |
| Range | 621 | 56 | 278 406 | 7 751 | 20 |
| Minimum | 85 | 24 | 21 594 | 173 | 3 |
| Maximum | 706 | 80 | 300 000 | 7 924 | 64 |

participants in the various activities, number of volunteers involved and the number of ambassadors who acted in the promotion and dissemination of each application.

In relation to the distribution by region, we can see that of the nine awards obtained up until 2022, four cities are located in the north (Guimarães, Maia, Gondomar and Braga), corresponding to 44.4%, two in the Metropolitan Area of Lisbon (Setúbal and Odivelas) and two in the Algarve region (Loulé and Portimão), corresponding to 22.2% each. These data help us to understand that there have been more applications and respective awards to European Cities of Sport in the north of the country.

With regard to the sporting events held (Table 2), it was possible to observe some variation between programmes. The Gondomar 2017 (n=391), Braga 2018 (n=612) and Portimão 2019 (n=706) editions stand out with the highest number of events. The Odivelas 2020 programme was greatly influenced by the Covid-19 pandemic and was subject to the rules imposed by the national health authorities. This had a significiant impact on aspects such as the cancellation of various activities and the reduced number of participants. The results show that, on average, 295 sport events were developed, out of a total of 2 658 organized by the nine candidate programmes.

Although the majority of events had a national/regional dimension (84.98%), we highlight the fact that there were also international activities (15.1%) – a total 402 out of 2 256. On the other hand, the organization of cultural and training side events should also be highlighted, including congresses and/or themed seminars, among others, with a total of 359 events, most notably in Loulé 2015, Braga 2018 and Portimão 2019, with 28, 102 and 141, respectively.

Concerning the number of sports (Table 2) involved in the activities programmes, it was possible to see that there were a considerable number of different sports, particularly in the Braga 2018 edition, which included 80 different sports, and Portimão 2019, which included 60, for an average of 50 sports per edition. The results obtained demonstrate the multidisciplinary dynamic that each city wanted to achieve.

Regarding the participants involved, there is considerable variation between editions, especially in the first editions, where Guimarães 2013, Maia 2014 and Loulé 2015 had 37 000, 120 000 and 21 594 participants, respectively. Despite the pandemic constraints in 2020 due to Covid-19, Odivelas achieved a significant number of 56 895 participants. On the other hand, the Setúbal 2016 and Leiria 2022 editions stand out as having attracted an extremely significant number of participants, with the first involving 300 000 participants and the second more than 200 000 (n=217 502).

Considering the reality of sport in Portugal, as well as the chronic habits of low physical activity, the results show a positive level of participation in all editions. In total, more than 1 000 000 (n=1 094 568) participants were involved in the nine European Cities of Sport programmes, equal to more than 1 million people involved in sporting activities over 10 years, with an average participation rate of more than 120 000 (n= 121 618) per edition.

In terms of volunteers involved in preparing and developing the programmes (Table 2), it was possible to see a high number of volunteers involved in the individual case of each edition, with an average of more than

2 000 (n= 2 107). In total, around 17 000 volunteers (n=16 857) were registered for the events held, with more than 1 000 volunteers involved in four of the award-winning editions. The Leiria 2022 award stands out, with more than 7 000 volunteers mobilized (n=7 924).

Finally, the number of ambassadors for the winning applications was also analyzed, as they play an important role in the credibility, dissemination and reach of an event. In this respect, we can see that nearly 200 ambassadors (n=192) were involved in all eight winning applications. We highlight Gondomar 2017 and Odivelas 2020, with 42 and 64 ambassadors, respectively. The case of Odivelas is paradigmatic, since it was affected by the Covid-19 pandemic. However, the involvement of a large number of ambassadors shows that they not only backed a very strong candidate, but aimed to break all records achieved thus far.

**Public Investment: ECS Sports Facilities and Equipment in Portugal**

Of the various factors involved in the candidature for the European Cities of Sport, the existence of municipal sports facilities and venues is very important in order to offer greater sports diversity and quality to the population.

Over the last few decades, Portugal has invested heavily in building and/or upgrading sports facilities and equipment for various purposes, with municipalities offering a wide range of conditions and high levels of sports practice. Despite this, Table 3 shows that there has been considerable public investment in this area, particularly as a result of the promotion of the application and the commitment made to winning the prize.

Considering the existing data on the applications for European Cities of Sport, we observed that there was a considerable total investment of more than €39 million (n=€39 613 000). The figure was certainly higher, but as we were only able to access the final data for six editions, it is not possible to determine the overall actual amount. The cities with the greatest investment were Braga 2018 and Odivelas 2020, which, in addition to all the programming and promotion of activities, also proceeded with the requalification and construction of large-scale sports venues and equipment.

The Odivelas 2020 edition shows very high figures in terms of investment per participant and per event.

**Table 3.** Municipal public investment by ECS in Portugal

| Editions | Municipal investment (%) | Average investment per participant (€/ participant) | Average investment per event (€/ event) | Average investment per sport (€/ sport) | Average investment per per resident (€/resident) |
|---|---|---|---|---|---|
| 2013 Guimarães | - | - | - | - | - |
| 2014 Maia | €700 000 (1.8%) | €5.83 (€120 000) | €2 800 (€250) | €29 166 (€24) | €5.17 (€135 306)* |
| 2015 Loulé | €607 000 (1.5%) | €28.11 (€21 594) | €7 058 (€86) | €12 645 (€48) | €8.59 (€70 622)* |
| 2016 Setúbal | €1 300 000 (3.3%) | €4.33 (€300 000) | €10 236 (€127) | €25 000 (€52) | €10.75 (€120 864)* |
| 2017 Gondomar | - | - | - | - | - |
| 2018 Braga | €14 220 000 (35.9%) | €108.30 (€131 313) | €23 235 (€612) | €177 750 (€80) | €78.35 (€181 494)* |
| 2019 Portimão | €3 800 000 (9.6%) | €28.89 (€131 860) | €5 382 (€706) | €63 333 (€60) | €68.33 (€55 614)* |
| 2020 Odivelas | €18 986 000 (47.9%) | €333.70 (€56 895) | €223 364 (€85) | - | - |
| 2022 Leiria | - | - | - | - | - |
| **Total (n=9)** | **€39 613 000 (100.0%)** | **€36,19 (€1 094 568)** | **€14 904 (€2 658)** | **€97 329 (€407)** | **€70,25 (€563 900)** |
| Mean | €6 602 167 | €84.86 | €45 346 | €61 579 | €34.23 |
| Median | €2 550 000 | €28.50 | €8 647 | €29 166 | €10.80 |
| Standard deviation | €7 976 633.50 | €127.70 | €87 504.50 | €67 605.30 | €35.90 |
| Range | €18 379 000 | €329.37 | €220 564 | €165 105 | €73.18 |
| Minimum | €607 000 | €4.33 | €2 800 | €12 645 | €5.17 |
| Maximum | €18 986 000 | €333.70 | €223 364 | €177 750 | €78.35 |

*Resident population according to census in Portugal

However, it should again be noted that, due to the restrictions caused by the Covid-19 pandemic in Portugal, the programme suffered several unforeseen changes and cancellations. Based on the results, we can observe that, in total and over 10 years, around €36 per participant and €14 904 per event were invested in six applications. The amounts would certainly have been higher if we had been able to collect information about the remaining three awards.

The Braga 2018 application upgraded the Parque da Rodovia with an investment of approximately €3 million, as well as the Altice Fórum Braga with a total value of €9 million. On the other hand, Odivelas 2020 justifies a greater investment due to the construction of two sports complexes with a total value of €12 million and the requalification of the Casa da Ginástica de Portugal with a total cost of €3 million.

The other award-winning cities invested smaller amounts, with Portimão 2019 investing considerably in the construction of the Boavista Municipal Pavilion, at a cost of €1.38 million out of a total investment of €3.8 million. The Setúbal 2016 application made a total investment of €1.3 million, having decided to upgrade the existing sports facilities and equipment, such as the municipal athletics complex and the municipal swimming pools. Finally, the Loulé 2015 candidature decided on a similar path, since the city already had modern sports venues and facilities that were properly equipped to host national and international events. The investment made was essentially for the construction of the Loulé Skate Park and the upgrading of some sports centres.

The overall amount in terms of public investment (> €39 million) illustrates the strong commitment that Portuguese applications have been making over the last decade, not only in encouraging individual applications to achieve the distinction of European Cities of Sport, but also in supporting, promoting and developing local and regional sport as one of the essential pillars of contemporary societies.

**Investment vs. Estimated Financial Return of ECS in Portugal**

In Table 4, we compare the investment made and the estimated financial return of the European Cities of Sport candidate programmes. Concerning the final reports consulted, it should be mentioned that the final data was only available for Setúbal 2016 and Portimão 2019 editions, although both presented a very positive result in terms

**Table 4.** Investment vs. estimated financial return of ECS in Portugal

| Editions | Municipal Investment | Financial return (estimate) | Economic and financial added value |
|---|---|---|---|
| 2016 Setúbal | €1 300 000 | €3 000 000 | €1 700 000 |
| 2019 Portimão | €3 800 000 | €5 000 000 | €1 200 000 |
| **Total** | **€5 100 000** | **€8 000 000** | **€2 900 000** |
| Mean | €2 500 000 | €4 000 000 | €1 450 000 |
| Median | €2 550 000 | €4 000 000 | €1 450 000 |
| Standard deviation | €1 767 766.90 | €1 414 213.50 | €353 553.30 |
| Range | €2 500 000 | €2 000 000 | €500 000 |

of financial return through the implementation of their respective activity programmes.

The Portimão 2019 candidature had an estimated return of €5 million after an investment of €3.8 million, which suggests an approximate impact on the local economy of more than €1million, while Setúbal 2019 had an estimated return of €3 million on a total of €1.3 invested, with an estimated impact on the local economy of €1.7 million.

The absence of data on the other applications does not allow for a more rigorous analysis. However, the ratio of investment versus financial return for both applications was extremely positive, justifying economically and sportingly the investment made in the applications and programmes developed as part of the European Cities of Sport award.

**Digital Outreach and Engagement of ECS in Portugal**

The information obtained shows a substantial impact at different levels, particularly in terms of the capacity to engage with thousands of people. The importance of social networks and digital media has grown substantially, making them the main vehicle for promotion and dissemination in the most diverse situations. This is why we also intended to analyse the reach and digital involvement of the winning applications, two indicators closely related to the impact and promotion of the candidate programmes.

As shown in Table 5 and despite the fact that not all the final reports enabled an evaluation of all the award-winning editions, there were different interactions on digital platforms per application. The existing data show more than 758 858 visits to the institutional online pages and

**Table 5.** Digital reach and engagement of ECS in Portugal

| Editions | Visits (official website) | Likes (Facebook) | Reach (people) |
|---|---|---|---|
| 2013 Guimarães | - | - | - |
| 2014 Maia | 370 055 (48.8%) | 13 900 (21.4%) | - |
| 2015 Loulé | 53 388 (7.0%) | 2 050 (3.2%) | - |
| 2016 Setúbal | 43 524 (5.7%) | 8 827 (13.6%) | 3 500 000 (43.8%) |
| 2017 Gondomar | 147 345 (19.4%) | 6 832 (10.5%) | 1 600 000 (32.5%) |
| 2018 Braga | - | 13 020 (20.1%) | - |
| 2019 Portimão | 144 546 (19.1%) | 7 447 (11.5%) | 1 900 000 (23.7%) |
| 2020 Odivelas | - | 12 829 (19.7%) | - |
| 2022 Leiria | - | - | - |
| **Total** | **758 858 (100.0%)** | **64 905 (100.0%)** | **8 000 000 (100.0%)** |
| Mean | 151 771 | 9 272 | 2 666 666 |
| Median | 144 546 | 8 827 | 2 600 000 |
| Standard deviation | 131 450 | 4 277 | 802 081 |
| Range | 326 531 | 11 850 | 1 600 000 |
| Minimum | 43 524 | 2 050 | 1 900 000 |
| Maximum | 370 055 | 13 900 | 3 500 00 |

more than 64 000 "likes" on the Facebook social network, with a reach of an estimated 8 000 000 people.

## Discussion

The main purpose of this research was to analyse the European Cities of Sport and to contribute to a better understanding of their effects and practical implications as a policy instrument for the public development of sport at a local level. The results we have obtained now allow us to build a better understanding of this reality and its impacts in the Portuguese context over the course of a decade (2013–2022), as well as to establish a theoretical-scientific body for future studies that intend to build more in-depth knowledge on this subject.

Considering the nine Portuguese distinctions, the results showed a total of 2 658 sporting events, of which 402 were international. Not only did we observe a high number of events associated with these awards, but there was, in our opinion, a clear intention by the organizing cities to internationalize their events, making their cities known to participants from diverse countries and also benefiting from the different associated impacts (economic, tourist and cultural, among others). In this context, studies of sport events, regardless of their size, have made it possible to understand the different impacts and benefits that sport has on local development (Koronios et al., 2020a; Matušíková et al., 2020; Reis et al., 2023; Teixeira et al., 2023b).

The high number of disciplines involved in these events also demonstrates the multidisciplinary capacity of sport to attract participants with different vocations and/or interests, in an average of 50 disciplines per edition. Not only has sport been used as an instrument for adopting healthier habits and combating sedentary lifestyles, but also as a form of social inclusion (Biernat et al., 2020; Hafner et al., 2020). The participation of more than 1 000 000 people over 10 years demonstrates unequivocally the aggregating role of sport, not only in terms of active participation, but also in terms of interest in supporting (volunteers N=16 857) and promoting (ambassadors N=192) sport and the importance of regular physical activity for all.

Regarding municipal public investment, although it was not possible to obtain data for all of the editions, it was possible to establish an overall investment very close to €40 million. Although there have been economic constraints on public management in Portugal in recent years (Santos et al., 2021; Sesinando et al., 2023), the volume and allocation of spending clearly demonstrate the intention to invest in sport and provide better conditions in terms of sports services and facilities for the population. The level of investment in each edition was different, being closely linked to the inherent needs that each candidate city identified as relevant and essential, as well as previous investments already made within the local sports programme.

As mentioned above, the European Cities of Sport award began in 2007 and is, first and foremost, an award that highlights the distinctive role of local promotion and commitment in encouraging the practice of sport (ACES Europe, 2023). However, it is also a way for each city to showcase itself to the international community and to promote itself as a destination at the most diverse levels (Matušíková et al., 2020).

The growth and importance of sport has become a significant indicator in the development of the local economy (Zourgani & Ait-Bihi, 2023; Mestre et al., 2023), which is why there is a growing focus on sports events as a means of attracting participants and visitors (Reis et al., 2023), in an attempt to obtain added value for cities as a result of the investment made (Maguire, 2019; Parent & Jurbala, 2023). Although derived from only two editions, the data obtained within this field indicates a significant economic return on the investment made, which contributes to an overall positive analysis of the sporting dimension of these editions.

Finally, and regarding the digital dissemination and interaction, the data obtained allow us to see that the respective award-winning cities were relatively active, both in terms of views on their institutional pages and on social networks. With more than 750 000 views and almost 65 000 likes (Facebook), it is estimated that a total of 8 000 000 people were reached, although this figure may be higher as we did not obtain complete data for all of the applications. The digitalization of sport is having an increasing impact at all levels (Koronios, & Dimitropoulos, 2020b), so digital interaction will be the future tool of reference for reaching and disseminating information to as many people as possible, leading to more participants, visitors and/or interested parties becoming involved in this type of initiative (Teixeira et al., 2023c).

In the European context, sport has the particular attribute of being politically recognized as a fundamental pillar in building a healthier and more modern society (Szczepaniak, 2020; Parrish, 2022). To achieve this, several strategies have been developed in recent decades to promote the importance of physical activity and sport at all levels that is accessible to all citizens without exception (Teixeira & Ribeiro, 2016; Volf et al., 2022; Sesinando et al., 2022).

The adoption of the European ideal of "Sport for All" has clearly established the political responsibility to intervene and guarantee widespread access to the necessary conditions for the population to progressively adopt healthier habits and behaviours (Fernandes et al., 2011; Ferguson et al., 2023), while at the same time combating and addressing the growing concern about sedentary lifestyles and the associated risk of various chronic diseases

or serious pathologies (Hosker et al., 2019; Jeong et al., 2019). To combat this problem, different instruments and programmes have been created over the last few decades to encourage EU member states not only to implement public policies to support and promote sport, but also to act effectively as the main agents of change (Malm et al., 2019; Magalhães et al., 2023).

This almost perfect symbiosis between the practice of sport and the promotion of different European regions has greatly enhanced both the cities and the way in which the importance of sport as a socio-economic catalyst is effectively viewed (Parrish, 2022; Moradi et al., 2023). It is in this context that the European Cities of Sport award gains even greater prominence by becoming a distinctive instrument for encouraging the development of local sports (Matušíková et al., 2020). The application to become a European City of Sport is clearly a political decision to confirm the municipality's ability to differentiate itself in promoting and boosting sport, especially since it is an assessment that is not governed by the organization of a particular event, but by a set of initiatives and activities of various types and with different objectives.

Furthermore, sport is increasingly an indicator of economic development (Maguire, 2019; Koronios et al., 2021b; Segui-Urbaneja et al., 2022), both at a local and national level, but also as a form of inter-generational socialization, sharing, social cohesion, spiritual healing and combating various diseases, providing countless reasons and motivations for practising it (Blanco-García et al., 2021).

It is within this framework that political decision-makers must focus their actions, especially when there is a clear public disinvestment in sport in the European context (Teixeira et al., 2023a), in exchange for a capitalist model of sport that has been accentuated in recent years (Gammelsaeter, 2021). Today, more than ever, sports policies must be geared towards benefiting populations, not only by improving health conditions throughout life, but most importantly by the direct impact it has on our lives and well-being (Nery et al., 2023).

Bringing politics and science closer together is an urgent necessity (De Bock et al., 2021), as this is the only way to achieve comprehensive results and implement efficient and effective strategies that guarantee the minimum conditions of access to sport, under the burden of returning to the past, where only a small elite had the necessary conditions to practise sport. Political decisions should not be held hostage to ideologies (Sesinando & Teixeira, 2022), but rather to the clear recognition that sport is an immeasurable benefit for society (Biernat & Piatkowska, 2020b) and that it should be encouraged more than ever.

These results clearly demonstrate the mobilizing capacity of strategically planned political action to promote and boost sport in a diversified way for all ages and contexts. The ECS award demonstrates to policymakers that it is only possible to develop sporting activity at a local level, from a long-term perspective and with high rates of participation and citizen involvement, through the effective implementation of public sports policies that benefit society at all levels.

The limitations of this study were essentially the lack of a body of theory on this topic, as well as the difficulty in obtaining comprehensive and standardized information. Although this distinction has existed since 2007, we found that this topic has aroused little interest from researchers and no answers were found to justify this current state of affairs. Scientific knowledge in the field of sports management has made significant progress in the last decade, so we would anticipate more knowledge on this particular topic.

In addition, public documents about the different awards are difficult to access and sometimes incomplete, which may be one of the main reasons for the continued low level of knowledge about this matter. The lack of greater knowledge and transparency hinders European political action, which could serve as an international benchmark for other countries, as political decision-makers would benefit even more from widespread knowledge about their decisions and their role in investment in local sports development and in building legacies associated with the adoption of healthier behaviours and habits by their populations.

In the context of the European Cities of Sport, there is plenty of scope for new studies to improve the understanding of their multiple impacts at a sporting, political, economic, social, cultural and touristic level, among other dimensions. Following on from the research carried out here, we believe it is essential to deepen knowledge on the various effects and practical implications of the award-winning programmes, in order to rigorously assess them as a differentiated policy instrument and their real capacity to stimulate and promote the sustained development of sport at local level, as well as the adoption of regular sports habits.

Countries such as Italy, Spain or the UK have also received several awards in recent years. Therefore, an in-depth study of different geographical realities would make it possible to build a robust body of theory on the importance and potential of the ECS as a flagship policy instrument, while a greater knowledge base would enable future policymakers to make more informed decisions based on science and multidisciplinary knowledge about sport.

## Conclusions

Scientific research in sports management has made great advances in the last decade, allowing for a deeper understanding of the public organisation of sport, as well as the role of the main stakeholders and political deci-

sion-makers in the development of local sport, answering the key questions of how, who, where, when and why. However, there is still a considerable gap in our knowledge. Addressing this issue must be seen as essential for a better understanding of European and national sports policies, while also analysing the political orientations and instruments available to act on sport and their reflection in each of the member states.

The case of the European Cities of Sport is therefore paradigmatic, since it is the largest local political recognition of the development of sport in Europe and involves a demanding process of multidisciplinary organization with direct impacts on the population. However, the evidence and scientific study on this subject is practically non-existent, making it impossible to assess its real effects and impacts on citizens, not only throughout the process, but especially on its possible legacy throughout Europe.

In this sense, the research undertaken provides us with a better understanding of a European reality that has been awarded with nine distinctions, while the data confirms that, from a conceptual point of view, this is a strategic resource not only for the development of local sport and raising interest in the importance of regular exercise, but also for the economic, social and cultural development of cities.

The provision of public sport services alone is no longer sufficient, and it is therefore necessary to continue efforts to promote diversified sport programmes and activities, supported by the political action of national and local governments and strategically planned as permanent policy measures for the modernization of societies and the physical and emotional well-being of their populations.

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# Impact of Remote Working on Recreational Physical Activity (RPA) Behaviours – a Case Study of the Covid-19 Lockdown in Poland

**Authors' contribution:**

A) conception and design of the study
B) acquisition of data
C) analysis and interpretation of data
D) manuscript preparation
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## Abstract

The aim of this article is to describe and explain changes in people's recreational behaviours caused by the shift to remote work (RW) or work from home (WFH) due to lockdowns during the Covid-19 pandemic. A literature review revealed a cognitive, methodological and applicative gap in this area. This relationship has not been analysed so far, particularly among Poles.

The authors developed an electronic questionnaire using a framework designed to study RPA behaviours. A survey based on the questionnaire was conducted from 20 May to 31 Oct. 2020 and included 533 respondents, with 371 people experiencing changes at work, 280 of whom shifted to RW/WFH. A combination of quantitative and qualitative data analysis methods (descriptive statistics and content analysis techniques, affinity diagram, relationship diagram) was used to analyse the survey results. The results of the qualitative analysis allowed a description of changes in the respondents' lifestyles induced by the transition to RW/WFH. The results of the quantitative data analysis showed unequivocally that taking up RW/WFH had a negative impact on RPA behaviours. The frequency and duration of workouts decreased.

The novelty lies in demonstrating the relationship between remote working/work from home and RPA and the inventive methodological approach. The results are universal and can be used to design work-life balance programmes for remote employees.

**Keywords:** COVID-19, lockdown, remote working (RW), work from home (WFH), recreational physical activity (RPA) behaviours.

## Introduction

Since the beginning of the 21st century, the development of information, computer and telecommunication technologies has resulted in an intensive growth of the phenomenon known variously as: "telework", "homeworking", "telehomeworking", "working from home", "telecommuting", "remote working", "remote work", "virtual work" and "e-work". While initially telework occurred mainly in developed countries, it is currently also a growing phenomenon in middle- and low-income countries (Bloom et al., 2015; Garrote Sanchez et al., 2021). The term "telework" was first defined by Nilles (Zhang et al., 2022) in the context of a substitute for going on business trips. In the terminology of the European Foundation for the Improvement of Living and Working Conditions reports, *telework is considered as a work arrangement in which work is carried out totally or partially from home with the support of ICT and partially or never from the employer's premises* (Eurofound, 2022). It is

emphasised that the types of telework are determined by how and where it is performed. Researchers distinguish and focus on three main areas of telework (Zhang et al., 2022): individual work at home – home-based work or work-from-home (WFH); team-based telework – group-based teleworking in a satellite office or a neighbourhood office centre that is remote from the main office but close to employees; and client-based telework – telework that usually involves travel and/or spending time on a customer's premises.

As evidenced by various studies, remote work generates many benefits at an organisational, economic and individual level (Tavares, 2017; Harpaz, 2002; The Lancet Public Health, 2020; Samuelsson, 2022; Ipsen et al., 2022; Allen et al., 2015; Weale et al., 2022; Guler et al., 2021). Positive aspects include flexibility of working hours, employee autonomy and achieving a better work-life balance (Work Life Balance – WLB) (Tavares, 2017; Harpaz, 2002; Galanti et al., 2021; Samuelsson et al., 2022; Ipsen et al., 2021; Weale et al., 2022), saving time spent on daily commuting, less emission, fewer traffic jams, and lower operating costs for employers (Harpaz, 2002; Bloom et al., 2015). According to research, telework is more productive as it minimises unproductive time spent doing meaningless tasks and allows people to focus on the core of the tasks at hand (Ipsen et al., 2021; Bloom et al., 2015; Guler et al., 2021), provided that employees maintain adequate levels of physical activity and are able to function in a comfortable and ergonomic workspace (Argus & Pääsuke, 2021).

There are also studies that identify negative effects of telework. These concern psychological aspects, such as lack of social contact with colleagues, loneliness, disrupted family relationships (Xiao et al., 2021; Bouziri et al., 2020; Galanti et al., 2021; Tejero et al., 2021; Chen, 2022), stress and depression (Tavares, 2017; Galanti et al., 2021; Hayes et al, 2021; Chen, 2022), as well as aspects of physical health, like unhealthy dietary changes (Bouziri et al., 2020; Xiao et al., 2021; Sato et al., 2021; Alah et al., 2022; Griffiths et al., 2022; Ekpanyaskul & Padungtod, 2021; Guler et al., 2021), long periods of sitting in front of a computer screen, weight gain (Suka et al, 2022; Guler et al., 2021; Ekpanyaskul & Padungtod, 2021; Alah et al., 2022), a lack of control over work time duration, often at the expense of sleep time (Bouziri et al., 2020; Alah et al., 2022; Tejero et al., 2021; Ekpanyaskul & Padungtod, 2021), poor working conditions and ergonomics (Argus & Pääsuke, 2021; Ipsen et al., 2021; Du et al., 2022; Ekpanyaskul & Padungtod, 2021) often causing the onset of backpain (Bouziri et al., 2020; Du et al., 2022; Guler et al., 2021) and reduced physical activity (Xiao et al., 2021; Fukushima et al., 2021; Griffiths et al., 2022; Suka et al., 2022; Ekpanyaskul & Padungtod, 2021; Alah et al., 2022). However, physical activity was not the main focus of the studies mentioned above, as they only dealt with overall measurements of the physical activity of people working on a remote basis.

The outbreak of the Covid-19 pandemic intensified the phenomenon of telework. In many countries, to counteract the spread of Covid-19, the decision was made to close borders and impose long periods of restrictions (quarantine and blockade) or partial limitations on residents and organisations. Organisations instructed their employees to switch to working remotely from home. In 2021, as many as 41.7 million people already worked on a remote basis in the EU, which was double the number of teleworkers in 2019. Conducted during the period of restrictions, studies of productivity and efficiency of WFH or WLB produced inconsistent results, as confirmed by the presented examples. The productivity of those working remotely in Austria (Weitzer et al., 2021) and China (Sun et al., 2023) suffered during the pandemic due to deterioration in physical and mental health, as well as interference of family members with work. In Hungary, the majority of those working in home offices did not suffer from deterioration in mental health or relationships with family members. This study also did not support the assumption of home workers being less efficient or less diligent in their daily work (Tánczos et al., 2022). In contrast, a study conducted by Italian researchers found that, among remote workers, family-work conflicts and social isolation had had a negative impact on productivity, while leadership and autonomy alone had had a positive impact on the productivity and work engagement of these workers (Galanti et al., 2021).

A relatively under-exposed theme in research on remote working is its impact on the lifestyles of employees, including students, and in particular on their recreational physical activity behaviours. Research conducted before the outbreak of the pandemic showed that reduced physical activity among employees caused a deterioration in their engagement in work tasks. Researchers found that employees reporting higher levels of physical activity during their leisure time scored higher in terms of work engagement, including the factors of vigour, dedication and absorption (Kiema-Junes et al., 2022). Sonnentag and colleagues found that a balance between work and leisure time is crucial for employee well-being (Sonnentag et al., 2008). However, the research findings that emerged after the outbreak of the pandemic were generally concerned with the impact of introduced restrictions on lifestyle and physical activity (Alah et al., 2022; Griffiths et al., 2022; Glebova et al., 2022; Guler et al., 2021; Ekpanyaskul & Padungtod, 2021). Glebova and López-Carril (2023) report that sports students changed their personal values and future plans, but it is differentiated between students, and professional athletes are more constant in their plans. The analysis of the literature on the subject

indicates the existence of a research, methodological and applicative gap in this area. The impact of remote working on recreational physical activity behaviours has not been addressed as a separate research theme. Such research has not been conducted in Poland either. Research methodologies are dominated by quantitative research strategies and quantitative methods of analysing their results. There is a lack of an approach combining quantitative and qualitative methods of data analysis, which would allow for a more comprehensive description and explanation of the phenomena under examination. The massive shift towards remote working during the Covid-19 pandemic provided a unique opportunity to study this phenomenon. The authors formulated the following research problem: Did taking up WFH as a result of the restrictions imposed during the Covid-19 pandemic affect RPA behaviours?

The aim of this article is to describe and explain changes in people's recreational behaviours caused by the shift to remote working or work from home due to lockdowns introduced during the Covid-19 pandemic. The following research questions were posed in pursuit of the aforementioned aim:

- What changes in the mode of work were induced by the introduction of RW/WFH?
- Did the change in the mode of work affect the respondents' lifestyles?
- Did the change in the mode of work affect the frequency of RPA?
- Did the change in the mode of work influence the duration of RPA?
- Did the change in the mode of work cause changes in favourite sports?
- Did the change in the mode of work influence the respondents' fitness and weight?
- Did the change in the mode of work cause the emergence of barriers to RPA?
- Did the change in the mode of work cause the occurrence of factors facilitating undertaking RPA?

# Materials and Methods

**Sampling and Data Collection**

The study employed a quantitative research strategy (Creswell, 2013). Based on an electronic self-administered questionnaire, the research was conducted between 20 May 2020 and 31 October 2020 among Polish adults. It covered the periods of the first full lockdown (from 20 May 2020 to 6 June 2020) and the subsequent partial lockdown (from 6 June 2020 to 31 October 2020). The selection of respondents was based on respondent availability, i.e. a non-probabilistic selection method. The electronic questionnaire was distributed via social media (FB, LinkedIn), instant messaging applications (messenger, WhatsApp) and email. For the purposes of the study, the definition of remote working was extended to include remote learning.

A total of 533 people took part in the study, of which 371 people indicated that their work had changed as a result of the pandemic: 280 people had started to work remotely, 33 people had changed their working hours and the remaining 58 respondents indicated other types of changes. The characteristics of the group of respondents who declared changes in the form of work are shown in Table 1.

**Table 1.** Research participants' demographics and their division into those working remotely (n=280) and those not working remotely but experiencing other changes in their work (n=91).

| | Respondents working remotely (n=280) | | Respondents not working remotely (n=91) | |
|---|---|---|---|---|
| Demographics | Frequency | Percentage | Frequency | Percentage |
| Gender | | | | |
| Female | 170 | 60.7 | 60 | 65.9 |
| Male | 110 | 39.3 | 31 | 34.1 |
| **Age** | | | | |
| up to 24 years | 121 | 43.3 | 45 | 49.4 |
| 25 – 44 years | 93 | 33.3 | 35 | 38.5 |
| Above 45 years | 65 | 23.3 | 11 | 12.1 |
| Mean = , SD = , range= | | | | |
| **Education** | | | | |
| Higher | 192 | 68.6 | 52 | 57.1 |
| Secondary | 86 | 30.7 | 36 | 39.6 |

| | Respondents working remotely (n=280) | | Respondents not working remotely (n=91) | |
|---|---|---|---|---|
| Primary | 2 | 0.7 | 3 | 3.3 |
| Place of residence | | | | |
| Big city / conurbation | 130 | 46.4 | 34 | 37.3 |
| Medium town | 82 | 29.3 | 32 | 35.2 |
| Small town | 38 | 13.6 | 13 | 14.3 |
| Village | 30 | 10.7 | 12 | 13.2 |
| Place of employment | | | | |
| School/university | 126 | 45.0 | 14 | 18.2 |
| Private business (employee) | 48 | 17.1 | 25 | 32.5 |
| Not in employment (student/pupil) | 46 | 16.4 | 4 | 5.2 |
| Private business (owner) | 20 | 7.1 | 12 | 15.6 |
| Public organisation (central administration, local administration) | 15 | 5.4 | 5 | 6.5 |
| Other | 14 | 5.0 | 5 | 6.5 |
| State-owned enterprise | 9 | 3.2 | 7 | 9.1 |
| I don't work | 2 | 0.7 | 5 | 6.5 |

Source: the authors' own work based on the study results

**Research Tools**

Recreational physical activity (RPA) is differentiated from other forms of physical activity (e.g. transport activity). Researchers indicate that people engage in RPA of their own free will and in their free time (Kantyka et al., 2020). The author's original survey questionnaire was based on a theoretical framework resulting from an analysis of the literature on the characteristics and elements that make up a description of recreational behaviours. These include:

- motivations (cf. Alexandris et al., 2002; Gabler, 2002),
- conditions – time, place, barriers (cf. Park et al., 2017; Alexandris & Stodolska, 2004; Chick & Dong, 2003),
- manner of execution – frequency, form (indoor, outdoor), type of sport (WHO, 2010; White et al., 2016; Ham et al., 2009; Zhang et al., 2015; Maciąg & Kantyka, 2020).

Additionally, the authors supplemented the questionnaire with questions for the respondents' self-assessment of body weight and physical fitness. With a view to pursuing the research objective, the questions concerned the recreational behaviours of the respondents working remotely both before and during the pandemic. The questions in the aforementioned areas were either closed or semi-open. A reliability test of the research questionnaire showed an estimate of Cronbach's alpha at 0.84.

An open-ended question was also added to the questionnaire in order to better understand and explain the mechanisms of the shift to remote working. It concerned the characteristics of changes in the forms of working that occurred as a result of the restrictions introduced during the Covid-19 pandemic.

The research questionnaire was approved by the Bioethics Committee and was found to have met the ethical standards of the Declaration of Helsinki, 2013.

**Data Analysis**

The results of the study were analysed using a mixed approach based on quantitative and qualitative methods, as well as analytical tools.

Descriptive statistics methods (modal, median, mean, standard deviation, percentage) were used to analyse responses to closed questions and demographic data (Little, 2013). The results were analysed by means of the Statistica 13 package from Tibco, Inc. A Friedman test, a non-parametric equivalent of a one-factor analysis of variance for repeated measurements, was used to test for the existence of differences between studies (Stanisz, 2006).

Qualitative methods were used to analyse the material obtained as responses to the open-ended question. As the first step, a content analysis was conducted using a word cloud and mind-mapping. The applied tool was the NVivo software. Additionally, an affinity diagram (Plain, 2007; Spiridonidou et al., 2010; Hayes et al., 2021) and relations diagram were used to arrange and structure the findings of the study, as well as to deepen the analysis. The choice of methods was justified by the specificity of the acquired research material (a large number of open-ended statements were obtained: 238 statements, in various grammatical

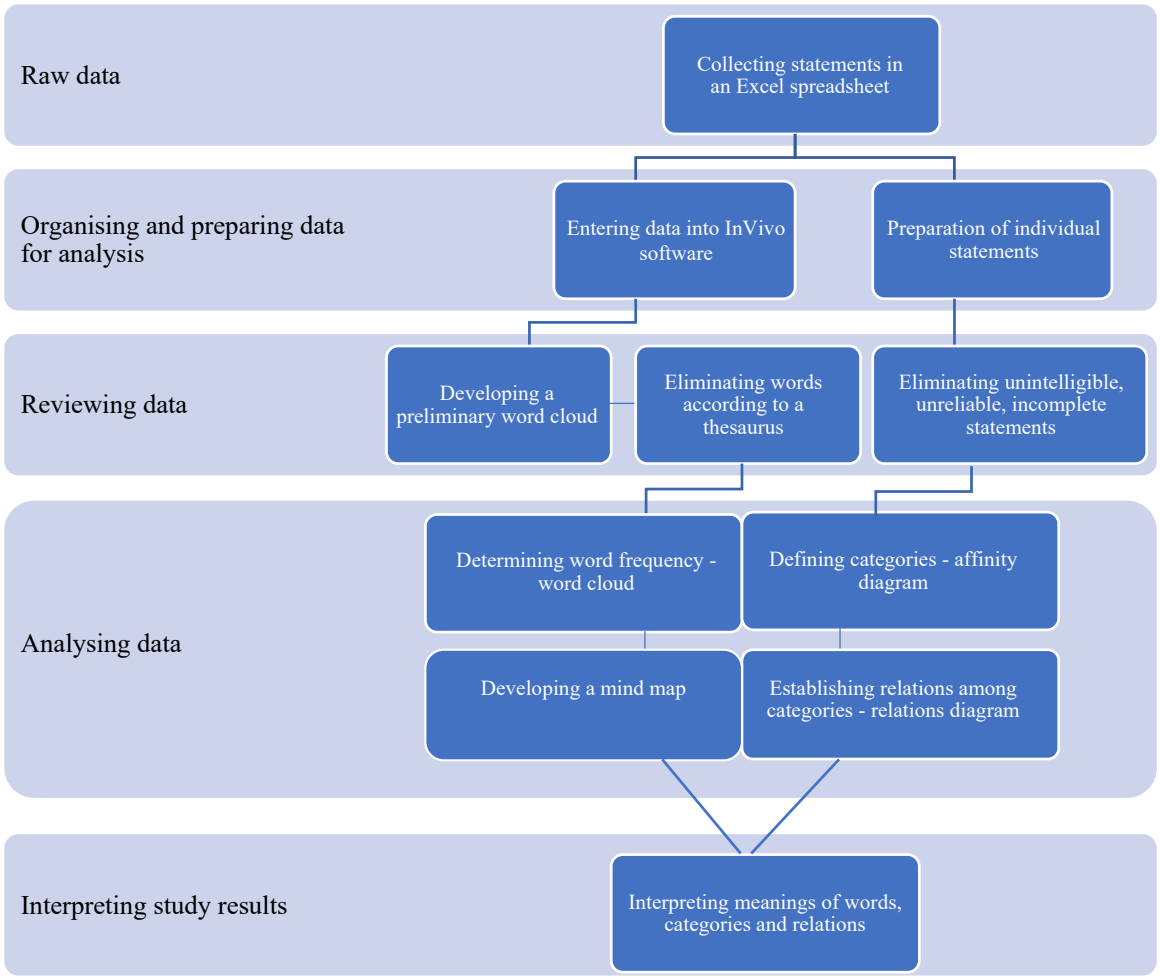


**Figure 1.** Steps in the qualitative analysis of the research material.

Source: the authors' own work based on (Creswell, 2013).

and stylistic formats, such as full sentences, sentence equivalents, single words and phrases), the time when the study was performed and the preliminary activities conducted in preparation for the proper study (a systematic review of the literature on the subject). A group work method was used in the development of the affinity diagram and the relations diagram. Figure 1 shows the procedural steps in the qualitative analysis of the research material.

Presented in the diagram, the selection of analytical methods allowed for the presentation of the context of the research problem analysed and the broadening of the results of the statistical analysis.

## Results

Firstly, the results of the qualitative analysis are presented in order to indicate what changes in the forms of work were induced by the introduction of remote working and whether this affected the respondents' lifestyles.

**Qualitative Analysis Results**

The qualitative methods of data analysis allowed the research material to be reduced to its most important meanings: the most frequently occurring words (content analysis – word cloud, in Figure 1, pic. 1), a more comprehensive description of the central category (mind mapping, Figure 2), the key categories (affinity diagram, Figure 1, picture 3) and the relations between them (relationship diagram, Figure 4). The study was conducted in the Polish language.

The aim of the word frequency analysis was to identify the words used by the respondents to describe changes in their work and their impact on their lifestyles. The most frequently used words included work (121 times), classes (47 times), remote (66 times), online (39 times), home (33 times) hours (26 times), time (17 times) and computer


**Figure 2.** A mind map – remote working.

Source: the authors' own work based on the study results.

(10 times). Further analysis of the pairs of words work/classes and remote/online with other words and phrases produced a mind map describing the dimensions in which changes in work occurred (Graph 2).

As the map above shows, the changes caused by the transition to remote working affected aspects such as working time, place of work, communication at work, type of work, tools, organisation of work, and loss of job (not being able to do one's previous job on a remote basis). However, the map explains only a part of the surveyed reality related to the shift to remote working. A preliminary analysis of the respondents' statements indicated that the issues raised were much broader in scope.

Therefore, an affinity diagram and a relations diagram were used to obtain a deeper insight into the results of the content analysis. The results are presented in Table 2 and in graphic form in Figure 3. The analysis was carried out twice in different study teams. For further processing, the authors chose the affinity diagram of the team in which a larger and more content-appropriate number of categories appeared as a result of the arrangement of the respondents' statements. There were 10 homogeneous categories with names such as 'on-site work', 'hybrid/mixed work', 'remote work', 'no work', 'spatial organisation of work/offices/services', 'lifestyle', 'work efficiency', 'rules at work', 'emotions, feelings' and 'work time'. Table 2 provides a brief description of each of the identified categories. It includes statements and paraphrases produced by the respondents.

In the table above, those phrases that describe the recreational behaviours of the respondents and their determinants are shown in bold.

OUT means the power of influence of a particular factor on other factors (a higher score means a stronger impact), and IN means that the factor is influenced by other factors (a higher score means the factor is more influenced). The analysis performed shows a chain of cause-and-effect relationships between the categories identified in the affinity diagram. This relationship can be presented as follows: the pandemic affects 1. remote working→ 2. hybrid working→ 3. organisational rules at work → 4. emotions and feelings, working time, spatial organisation of work → 5. work efficiency → 6. lifestyle.

**Table 2.** A description of the categories and their characteristics based on an affinity diagram.

| Category identified in the affinity diagram | Characteristics of category |
|---|---|
| on-site work, | maintaining on-site work, introducing shift work |
| hybrid/mixed work | rotational work system |
| remote work | combining work with other responsibilities e.g. childcare, changing working hours to accommodate needs of household members, **online training**, online learning, not leaving home, leaving home only to do shopping, switching from full-time on-site work to remote work (return, no return to on-site work), no more commuting |
| unemployment | loss of job, interruption in employment - workplace shut down, **no sports events** |
| spatial organisation of work/office/duties | change in work organisation, people spread out in separate offices instead of open space, no customer visits, lack of regularity |
| lifestyle | sleeping longer, **less physical activity**, more time spent sitting in front of a computer, **immobility**, sitting without purpose, **physical activity at home** |
| work efficiency | reduced self-discipline, inefficient learning, saving time on commuting |
| rules at work | mask, disinfection, longer/shorter working hours |
| emotions, feelings | everything has been turned upside down, working remotely is not satisfying, you become lazy, **it is difficult to balance work and personal life**, too much focus on yourself, **more leisure time**, greater safety, maintaining distance, easier to organise, pressure of work, **no leisure time** |
| working time | overtime, different working hours |

Source: the authors' own work based on the study results.

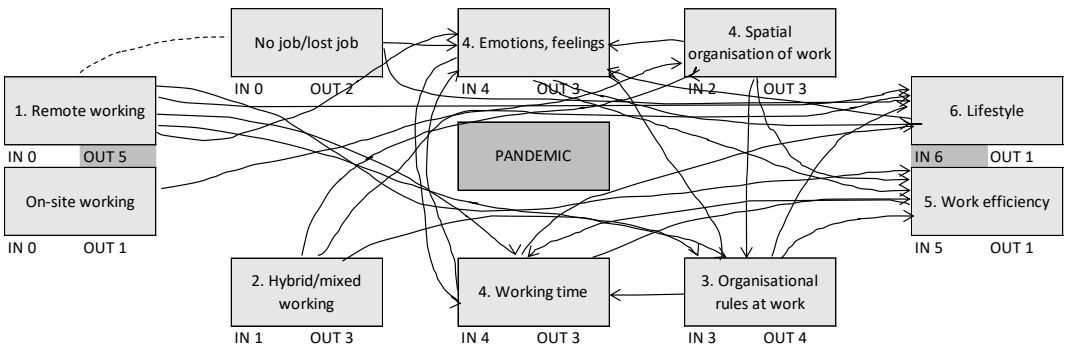


**Figure 3.** A relations diagram.

Source: the authors' own work based on the study results.

**Results of the Quantitative Analysis**

The results of the quantitative analysis made it possible to indicate the extent to which the respondents' recreational behaviours changed as a result of the switch to remote working.

*Impact of Changes in the Mode of Work on the Respondents' Motivations to Engage in RPA*

The respondents were asked about their health and psychological motivations to engage in recreational physical activity during the pandemic and the associated barriers. Those who had switched to remote working most frequently indicated improved well-being (59.26%), improved functional fitness (56.67%) and maintaining a healthy body weight (49.26%) as their motives related to health. The strongest psychological motives included pleasure, rest and relaxation (65.17%), escape from stress (42.32%), opportunity for self-fulfilment (32.21%) and use of leisure time (26.59%).

A shift to remote working does not statistically significantly differentiate the motives for undertaking RPA.

*Impact of Changes in the Mode of Work on the Frequency of Undertaking RPA*

An important issue addressed in the study was the impact of the transition to remote working on the frequency of respondents' RPA. This frequency was measured by the number of workouts per week. The respondents were divided into three groups (Table 3): occasional exercisers (from 1 to 2 workouts per week), moderate exercisers (from 3 to 4 workouts per week), and intense exercisers (from 5 to 7 workouts per week).

In the group of occasional exercisers, the switch to remote working resulted in an increase in the frequency of RPA from 22.6% to 31.5%. In the group of those exercising moderately, the switch to remote working caused a decrease in the frequency of RPA from 45.9% to 38.5%. The frequency of RPA was not influenced by the switch to remote working in the case of intense exercisers.

With respect to the frequency of RPA, switching to remote working had a negative impact on those exercising moderately and a definitely positive impact on occasional exercisers.

*Impact of Changes in the Mode of Work on the Duration of Workout Sessions*

An important issue addressed in the study was the impact of the respondents' transition to remote working on the duration of workout sessions. Workout volume is the amount of time spent on RPA. Consequently, with regard to their duration, workout sessions were divided into four groups (Table 4): RPA duration from 0 to 20 min., RPA duration from 21 to 40 min., RPA duration from 41 to 60 min., and RPA duration of more than 60 min.

As can be seen from the data, the transition to remote working resulted in an increase in the number of respondents whose workout sessions lasted from 0 to 20 minutes from 6.07% to 14.54%. The number of those exercising from 21 to 40 minutes and from 41 to 60 minutes in one session also increased, from 13.21% to 20.57% and from 33.21% to 36.86%, respectively. A decrease was recorded only in the number of those exercising in RPA workout sessions longer than 60 minutes, from 47.50% to 24.59%.

The switch to remote working had an adverse impact on the respondents who preferred workout sessions lasting longer than 60 minutes, while the other four groups showed respective increases.

A potential correlation was also examined between the duration of workout sessions of those working remotely and the frequency of RPA undertaken by them. In conclusion, significant differences (chi2 = 54.9 at $p<0.001$) could be observed in the number of workouts before and during the pandemic. During the pandemic, the respondents working remotely worked out less frequently and

**Table 3.** The frequency of the respondents' engagement in RPA.

| Frequency of RPA | Respondents working remotely | |
|---|---|---|
| | Before pandemic N 257 (%) | During lockdown N 270 (%) |
| Occasional exercisers (from 1 to 2 workouts per week) | 58 (22.6) | 85 (31.5) |
| Moderate exercisers (from 3 to 4 workouts per week) | 118 (45.9) | 104 (38.5) |
| Intense exercisers (from 5 to 7 workouts per week) | 81 (31.5) | 81 (30.0) |

Source: the authors' own work based on the research results.

**Table 4.** The duration of the workout sessions of the respondents working remotely.

| Volume of RPA workout sessions | Respondents working remotely (n=280) | |
|---|---|---|
| | Before pandemic N (%) | During lockdown N (%) |
| 0-20 min. | 17 (6.07) | 41(14.54) |
| 21-40 min. | 37 (13.21) | 58 (20.57) |
| 41-60 min. | 93 (33.21) | 102 (36.86) |
| over 60 min. | 133 (47.50) | 79 (24.59) |

Source: the authors' own work based on the research results.

for shorter periods. These decreases are also shown by chi2 = 96.4 at $p<0.001$. For those working remotely, significant statistical differences can be observed between the length of workouts before and during the pandemic. In conclusion, those working remotely reduced both workout frequency and duration during the pandemic.

*Impact of Changes in the Mode of Work on Preferred Sports Disciplines*

The most popular forms of RPA before the pandemic among the respondents who switched to remote working included fitness, gym and cycling. After the outbreak of the pandemic, cycling, running and yoga became the most popular disciplines. It is concluded that the change in favourite disciplines was not caused by the shift in the mode of work, but definitely by the shutdown of gyms, fitness clubs and other sports facilities.

**Self-assessment of Fitness and Body Weight**

The results of self-assessments of fitness and body weight show that the pandemic did not affect the study participants. The quantitative analyses indicate the absence of any significant differences in the respondents' declarations concerning their fitness and body weight. It can be assumed that the relatively short duration of the study may have influenced such assessments of the respondents' physical fitness and body weight.

**Remote Working and Barriers to Engaging in RPA**

The questionnaire asked the respondents about barriers to participation in RPA during the lockdown. The major constraints indicated by those working remotely included not being able to practice their favourite sport (40.3%), as well as not having access to parks, forests and other areas where they could previously practice physical activity (34%).

**Factors Facilitating Workouts in Isolation During the Pandemic**

When asked about factors that made it easier for working people to engage in RPA, the study participants most often pointed out more free time (31.8%), possession of sports equipment (17.6%) and free online training instructions (17.1%).

## Discussion

The results of the study partly confirm the findings of other authors and indicate new areas of research.

The results of the qualitative analyses clearly indicate that the introduction of remote working/work from home influenced the respondents' lifestyles, including RAF behaviours. At the same time, it is difficult to clearly assess the impact on lifestyle as positive or negative. This is consistent with the findings of other authors. Many of the respondents referred to the positive aspects of working from home such as savings on commuting, better organisation of work and more free time, which is also confirmed in the research reported by other authors (Harpaz, 2002; Samuelsson et al., 2022; Bloom et al., 2015; Allen et al., 2015; Weale et al., 2022; Guler et al., 2021), and the facilitation of childcare, which is also pointed out by Hilbrecht et al., 2008 and Hilbrecht et al., 2013.

The study presented herein also revealed another pandemic-related factor, namely safety. By working from home, those surveyed reduced the risk of contracting the virus. In this context, safety should be regarded as a positive factor. The respondents also mentioned the negative aspects of WFH, such as a disturbed work-life balance, which is also confirmed by other research (Galanti et al., 2021; Tejero et al, 2021; Chen, 2022), less physical activity, immobility, more time spent sitting in front of a computer screen (Fukushima et al., 2021), frustration, fatigue and depression (Tavares, 2017; Galanti et al., 2021; Hayes et al., 2021; Chen, 2022). The results of the study also show that, according to the respondents, the shift to remote working had an impact on their RPA behaviours. Examples include workouts based on online instructions in response to the shutdown of public sports facilities. Glebova et al. (2022) indicated that the development and deployment of new technologies in the sports sector was strengthened.

The results of the quantitative analysis show that the transition to remote working did not significantly change the respondents' motivation to engage in RPA. The most frequently mentioned motives included improvements in well-being, pleasure, rest and relaxation. However, the shift to remote working differentially affected the frequency of undertaking RPA. Occasional exercisers (1–2 workouts per week) increased this frequency, moderate exercisers (3–4 workouts per week) decreased the number of workouts, while there was no change in this respect among intense exercisers (5–7 workouts per week). The results of the study show that the switch to remote working also caused changes in the duration of workout sessions. The proportion of short training sessions of up to 60 minutes increased significantly, while at the same time the proportion of training sessions over 60 minutes decreased. The conducted statistical analysis shows a significant correlation between the frequency and duration of workout sessions: during the pandemic, those working remotely worked out less frequently and for shorter periods. This phenomenon can be explained by the results of the qualitative study and, above all, by the limitations that remote working introduced into the lives of the respondents, as discussed above. Despite the existence of factors indicated by the respondents as

conducive to engaging in RPA while working remotely, such as more free time, possession of sports equipment, online training instructions or greater work organisation flexibility, they did not translate into an increase in the frequency of RPA or the length of workout sessions. On the other hand, changes in favourite sports among those working remotely were caused by the restrictions introduced in Poland during the period under examination (shutdown of indoor and outdoor sports facilities, the ban on access to parks and forests). This is also confirmed by the barriers to engaging in RAF indicated by the majority of the respondents: no possibility to practise their favourite sports and no access to sports facilities.

The results of the study are original, as the theme of the impact of RW/WFH on RPA has not been addressed in the literature to date. Thus, there is a shortage of studies comprehensively covering all the elements that make up a model of RPA behaviours (motives for engaging in RPA, frequency of RPA, duration of workout sessions, barriers to undertaking RPA, sports disciplines, etc.) of people working remotely. They show that the transition to remote working had a negative impact on RPA behaviours, primarily with regard to the frequency and length of workout sessions. The recreational activity of those working remotely decreased.

It is also necessary to point out the methodological aspects of the study. Research on RPA is most often conducted using quantitative methods of data collection and analysis. The introduction of qualitative data analysis provided an opportunity to broaden the scope of the study and thus better describe and explain changes in RPA behaviours. The conducted research is a continuation of the methodological theme of the authors' earlier research, which aimed to incorporate qualitative data analysis methods into the study of RPA behaviours (Kantyka et al., (2022). This is a novel approach worth pursuing in subsequent projects.

The applicative dimension of the study is relevant for employers and institutions responsible for public health policy. According to the MultiSport Index 2022 study, two out of three adult Poles (65%) are currently engaged in physical activity at least once a month, which means a decrease of 3 percentage points compared to the data from the previous year (68%) and at the same time a return to the value from before the outbreak of the pandemic. According to the WHO, the workplace is an environment where health promotion can and should take place. According to Kiema-Junes et al. (2022), promoting employees' leisure time and general physical activity can foster work commitment, although this shall be confirmed in longitudinal studies. An investigation carried out by Seviç and Başaran (2022) showed that recreational physical activity positively affected mental well-being scores and resulted in lower anxiety and phobia scores during a lockdown. The results clearly show that the positive aspects of remote working/work from home need to be strengthened by additional measures to effectively motivate employees to be physically active. The local public and governmental institutions should support employers and citizens to improve their RPA.

## Limitations

The main limitations of the study include the following:

- the use of respondents' self-assessments (the respondents' self-assessments weren't verified with other objective indicators);
- the selection of respondents was based on non-probability sampling (Babbie, 2013),
- the distribution of the questionnaire through social media and e-mail (restrictions during lockdown made it impossible to reach respondents in any other way; the use of the internet and social media in the research restricted the group of potential respondents, since 81.4%, 65% and 53% of Poles use the internet, e-mail, and social media, respectively[1],
- the relatively short period covered by the study (the research focused on the period covering the first wave of the pandemic and related restrictions).

Future directions for research are related to continuing the research on RPA behaviours and its conditioning by remote work/work from home, the effectiveness of the wellness strategies and the quality of recreational offerings of the local institutions (fitness clubs, NGO's, municipality). The methodological research on the use of quantitative methods of data collection and analysis should be developed in interdisciplinary studies on recreational activity.

**Conclusion**

The COVID-19 crisis provided an opportunity to examine changes in RPA behaviours. The aim of the article was to examine changes in people's recreational behaviours caused by the shift to remote working or work from home due to lockdowns introduced during the Covid-19 pandemic. The literature review showed that the pandemic has had an uncommon impact on the acceleration of the development of remote work, which brought positive and negative effects.

The research results and their discussion, presented above, allow for the formulation of cognitive, methodological and application conclusions. The results of the

[1] Information Society in Poland in 2020.

study clearly show that shifting to RW/WFH affected the respondents' lifestyles and RPA behaviours. During the pandemic, the lives of those who worked remotely was characterised by less frequent and shorter periods of recreational activity. The study presents new insights and bridges a certain cognitive gap in this field.

From the methodological perspective, it is worth underlining that the application and combination of qualitative and quantitative methods of data analysis is an effective approach to solving the scientific problem. Even though the qualitative methods imposed more limitations, they deepened our understanding of the background and quantitative results of the research. Qualitative tools such as the affinity diagram and relations diagram are taken from the toolbox dedicated to quality management methods, and their use in this research proved their universality.

The applicative dimension of the study is relevant for employers and policymakers. Employers should design and implement corporate wellness strategies to ensure the health, well-being and work-life balance of employees and students working and learning on a remote basis. Public health policy should be reviewed to improve support for employers and to secure funds and organisational support for the creation of proper recreational options for local citizens.

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# Olympism in School and Competitive Anxiety: Its Influence on Participants and Their Perceptions

**Authors' contribution:**

A) conception and design of the study
B) acquisition of data
C) analysis and interpretation of data
D) manuscript preparation
E) obtaining funding

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## Abstract

Anxiety is one of the most widespread mental health disorders worldwide. It is prevalent throughout the life cycle and appears in multiple contexts, such as sports.In line with the idea of sport as a means of promoting integral health, the Andalusian Olympic Foundation promotes Olympic values through the "Olympism in School" programme. This programme, developed in two phases – theoretical and practical (including a "Mini Olympics") – aims to improve the psychological development of participants through sporting competition. In order to demonstrate whether the management of factors such as competitive anxiety was achieved through this programme, 153 children aged 10-13 completed a socio-demographic data questionnaire and the SAS-2 questionnaire after participating in sporting events. The results showed that the participants endured intermediate levels of competitive anxiety (with greater weight given to the worry factor) and that the anxiety was greater in children not used to competition or who did not usually enjoy it. These findings indicate that competition is a factor related to anxiety in children and that strategies for managing the impact of the competitive context are necessary to enable enjoyment and healthy participation.

**Keywords:** Competition, Physical Education, Somatic Anxiety, Worry, Distraction

## Introduction

### Olympism in School

There is some interest in Olympic education in the scientific literature, and a number of authors have conducted studies on the topic. For Brownlee (2000), Olympic education is an integrative concept in which the values of Olympism (e.g. tolerance, individual development, respect, cultural and personal identity, etc.) are combined with the philosophy of the Olympic movement. An important aspect would be to differentiate between Olympism and Olympic values, which, due to their particular idiosyncrasy, are closely related (Olympic Charter, 2020). Based on the Olympic Charter (2020), Olympism can be understood as a movement in which sport is associated with culture and education and, based on essential values, promotes a lifestyle associated with effort, setting a good example, social responsibility and respect for the fundamental ethical principles. However, Olympic education cannot be reduced to academic knowledge alone, but goes beyond that (Peneva, 2009). For other authors, this construct is complex, with great possibilities and great ignorance on the part of the educational community (González-Mármol et al., 2015; Hood and Kirkpatrick, 2010; Molina, 2011).

As stated in the Olympic Charter (2020), the values of Olympism must be transmitted, so various organisations are responsible for this function. At the national level, the Spanish Olympic Committee is in charge of these functions. As stated in the Olympic Charter (2020), National Committees must promote the principles and values of Olympism in their respective countries, supporting Olympic education programmes at all levels of primary and secondary education. At the regional level, Andalusia has the Andalusian Olympic Foundation, which, as stated in Article 5 of Chapter I of its Statutes, is responsible for "developing and promoting the Olympic Movement in Andalusia under the principles of the Olympic Charter, uniting culture, education and sport, seeking the integral development of society and contributing to a better and more peaceful world" (Andalusian Olympic Foundation, 2022).

From the Andalusian Olympic Foundation, Olympic education has been integrated into schools through its Olympism in the School programme (Arévalo and Sotoca, 2014; Andalusian Olympic Foundation, 2022). Specifically, this programme aims to introduce students from schools (state, subsidised and/or private) into the world of Olympism through the celebration of an Olympic Week at their own schools, where participants must apply the Olympic values of team performance, justice, self-realisation, respect for opponents, etc., as well as compliance with rules and achievement of collective and personal goals (Andalusian Olympic Foundation, 2022). As already explained by Arévalo and Sotoca (2014), the programme itself has two phases: the first is more theoretical and involves analysis and development of theoretical materials provided by the Andalusian Olympic Foundation; all schools that wish to participate do so. In the second phase, with a practical orientation, schools send a dossier reporting all activities at their centre to promote Olympic education and a video recording showing the degree of implementation and development of Olympism in the school. After receiving all materials, the Andalusian Olympic Foundation evaluates what was received and selects 14 schools from different Andalusian localities to participate in a "Mini Olympics". This competition takes place over seven days, during which the selected schools participate in a multi-sport competition (mini-tennis, mini-basketball, wrestling, rowing ergometer, boccia, tag rugby and track'athlon). All sports modalities are counted to generate a general classification after the last test. Schools must select a team from their schools (10–12 individuals), who may belong to any cycle of primary education. As stated by the Andalusian Olympic Foundation (2022), a total of 235 Andalusian schools participated in its 2021 edition, with more than 55 000 students; only 14 schools were included. It is a consolidated programme with great potential for action.

Olympic sport and Olympism have competition as their central component. However, competition cannot always be associated with positive values or adaptation; it can be detrimental to participants when not designed well or adjsuted to the ages and characteristics of the target population. These characteristics include a higher risk of injuries, frustration, and competitive anxiety.

**Competitive Anxiety**

There are an increasing number of mental health problems in the world, with anxiety being one of the most prominent (Eime et al., 2013; Nixdorf et al., 2016; Pluhar et al., 2019). As various authors have pointed out (Glover and Fritsch, 2018; Sabiston et al., 2016), anxiety is an endemic illness, with prevalence data ranging from 5–10% in children and up to 25% in adolescents. In this context, physical activity has been shown to be a useful tool in the prevention and management of anxiety disorders (Eime et al., 2013; Nixdorf et al., 2016). However, sports practice can also have an impact on the development of psychological disorders in childhood and adolescence, such as eating disorders (Díaz-Ceballos, 2005; Pustivšek et al., 2020), or anxiety disorders (García-Ceberino et al., 2022; Ortega-Vila et al., 2020; Pluhar et al., 2019; Wang, 2023).

*Conceptualisation*

Anumber of authors have attempted to approach the construct of anxiety, being defined by some as the emotional state characterised by apprehension and tension (Martens, 1977; Spielberger, 1966). Rice et al. (2019) reported that anxiety is characterised by emotional responses linked to fear, mistrust, dread, etc. in response to a real or perceived threat. In addition, Spielberger (1971) stated that the level of anxiety experienced by a subject at a given moment does not depend solely on the stressful situation itself, but will be linked to the subject's perception of the danger or harm of the situation.

In the field of sports and competition, anxiety can be conceptualised as a trait (linked to the athlete's personality) or as a state (characterised by feelings associated with the activation of the organism depending on the moment in which it is found) (Martens et al., 1990). Thus, Morris et al. (1981) defined competitive anxiety as the set of negative expectations and cognitive concerns about oneself, the situation at hand, or possible consequences. Likewise, anxiety cannot be understood as a unidimensional construct, as it represents a clear physical component (somatic anxiety) and a thinking component (cognitive anxiety) (Pérez-Cáceres et al., 2021; Pulido et al., 2019; Weinberg and Gould, 1995). The competitive anxiety model of Martens et al. (1990), a reference model in the conceptualisation and analysis of child and youth competitive anxiety, differentiates between somatic and cognitive anxiety. Somatic anxiety is the set of psychological and affective elements of the experience of anxiety that develop from one's own level of activation and are manifested through

bodily symptoms linked to the autonomic nervous system (e.g., sweating, tachycardia, tremors, etc.) (Arnau et al., 2018; Pérez-Cáceres et al.; 2021; Rodríguez-Gómez and Granero-Gallegos, 2004). As for cognitive anxiety, it is considered as the mental component of anxiety caused by negative expectations about a situation or self-evaluation (Martens et al., 1990; Pérez-Cáceres et al., 2021; Ramis et al., 2010). Based on this model, Smith et al. (1990) proposed a differentiation within the cognitive component: worry and distraction. Worry refers to concern about possible negative consequences of poor performance and distraction, while distraction is associated with athletes' difficulty in focusing on key aspects of a task, which prevents them from having clarity of thought during competition (Grossbard et al., 2009).

*Competitive Anxiety and Main Study Variables*

At a sports level, Borges et al. (2020) indicate that competition represents a challenge, which can be a source of activation or the origin of alterations for the athlete. In this sense, there are various variables that affect the perceptions of athletes in one way or another (e.g. sex, age, competitive level, etc.), and have an impact on their degree of anxiety (Anshel, 1995; Rice et al., 2019; Ruiz-Juan et al., 2016). Thus, the most widely addressed variables related to competitive anxiety are: age (Bohórquez and Checa, 2017; Ramis et al., 2015), gender (Grossbard et al., 2009; Parnabas, 2015; Pulido et al., 2019), and type of activity practised (Bohórquez and Checa, 2017; Núñez et al., 2020; Ramis et al., 2013), as well as other variables such as competitive level, group cohesion, and resilience (Arnau et al., 2018; Bohórquez and Checa, 2017; Pérez-Cáceres et al., 2021; Pulido et al., 2019; Ramis et al., 2015). Similarly, the scientific community has also taken account of the influence of sports and competitive practice of relatives, and athletes' tastes and/or competitive experience and their interaction with competitive anxiety (Bohórquez and Checa, 2017).

Thus, the importance of competitive anxiety for children has been examined, leadoing to an increase in the number of studies linked to this theme (Arnau et al., 2018; Bohórquez and Checa, 2017; Bois et al., 2009; Borges et al., 2020; García-Mas et al., 2011; Grossbard et al., 2007; Grossbard et al., 2009; Pérez-Cáceres et al., 2021; Pluhar et al., 2019; Ramis et al., 2013). High levels of competitive anxiety are presented as a predictor of abandoning sports practice and are associated with low performance and less enjoyment (Gould et al., 1985; Scanlan et al., 2005; Smith and Smoll, 1991). Furthermore, competitive anxiety can act as a block to or debilitating element in performance, acting at a motor, physiological and cognitive level, with the latter being associated with concern for performance (Borges et al., 2020; Ponseti et al., 2016).

The higher values of competitive anxiety found in male athletes are linked to a higher level of demand and, as a consequence, a higher level of performance (Borges et al., 2020), which may be linked to greater experience at competitive levels. Pluhar et al. (2019) indicate that young athletes in individual sports activities demonstrate higher levels of anxiety and depression than those in collective sports. In the case of family sports practice, Bohórquez and Checa (2017) stated that it does not influence the competitive anxiety of minors, although it could be linked to family expectations and their sports practice. However, minors' sports practice depends on the support provided by parents, which may be linked to their own sports practices (Barber et al., 1999). In addition, Bois et al. (2009) indicated that family practices at the level of support-understanding or pressure would influence subjects' anxiety.

While the relationship between competitive sports practice and experiencing anxiety in childhood and adolescence has been studied, there is currently no information available about the relationship between competitive sports practice in school sports and competitive anxiety. Thus, it is necessary to explore the influence that this competition may have on participants' competitive anxiety depending on the influence of family members' sports practice (mother, father and siblings), family members' competitive habits (mother, father and siblings), and the affinity with competitive contexts and the competitive experience of young athletes.

**Research Problem**

As Gómez-Mármol et al. (2019) point out, there are few studies in Spain that address Olympism from an educational perspective. Therefore, focusing on the influence of this type of action on the subjects involved would be key in developing effective programmes that do not negatively affect their participants. In accordance with this aim, Arévalo and Sotoca (2014) focused on analysing teachers' perceptions in the Olympism in School programme, but attending to the perceptions of teachers and focusing closely on the more theoretical and conceptual part of the programme. However, there is a lack research related to the practical part of this programme and its relationship to the anxiety its participants might perceive in the Mini Olympics competition; as representatives of their schools, they could feel a responsibility and expectations that are far removed from the pricnipal aim of this type of programme.

After participating in the organisation of some of the tests of the Mini Olympics in Andalusia, the first author of this paper was able to verify first-hand that participants (often novices in competition) showed signs of nervousness and frustration, which gave the event a charater far removed from the original spirit intended (a fun environment, personal and group growth, and values linked to Olympism). Therefore, after consulting the existing literature, a research gap was detected on this theme

and a need to determine whether the programme itself was moving away from its primary sense or whether it required some type of modification. It was also evident that there is controversy regarding the experience/demand of competitive activities and the action of family sports practices in relation to competitive anxiety perceived by children. This subject requires greater in-depth analysis, and this paper can help shed light on these aspects.

**Research Objectives and Hypotheses**

After reflecting on all of the reasons above, the main objective of this work is to determine the influence of the Mini Olympics phase of the Olympism in School programme of the Andalusian Olympic Foundation on competitive anxiety as perceived by participants. The previous main objective suggests two specific objectives:

– Detect competitive anxiety among Mini Olympics participants based on family sports practice and attendance at competitions (father, mother or siblings).

– Detect competitive anxiety among Mini Olympics participants based on their taste and competitive experience.

Based on the stated objectives, the following research hypotheses are formulated:

H1→ Mini Olympics participants will perceive intermediate levels of competitive anxiety.

H2→ Those participants in the Mini Olympics whose parents play sports will perceive more competitive anxiety than those whose relatives are not involved in sports.

H3→ Those participants in the Mini Olympics whose parents compete will perceive more competitive anxiety than those whose relatives are not involved in competitive activity.

H4→ Those participants in the Mini Olympics who do not like to compete will perceive more competitive anxiety than those who declare the aim to enjoy competitive activity.

H5→ Those participants in the Mini Olympics without previous competitive experience will perceive more competitive anxiety than those who have competed before

# Methodology

**Participants**

This study involves students selected for the Mini Olympics phase of the Olympism in School programme of the Andalusian Olympic Foundation. Following the rules of this competition, 14 schools participate with a representation of 10–12 subjects per school, so the total sample universe is 140–168 subjects. The sample selection was carried out through a non-probabilistic convenience sampling, and a total sample of 153 subjects (91.07% of

**Table 1.** Main sociodemographic data.

| | | *N* | *%* |
|---|---|---|---|
| Gender | Boys | 82 | 53.6 |
| | Girls | 71 | 46.4 |
| Do your relatives play sports? (Mother) | Yes | 69 | 45.1 |
| | No | 84 | 54.9 |
| Do your relatives play sports? (Father) | Yes | 80 | 52.3 |
| | No | 73 | 47.7 |
| Do your relatives play sports? (Siblings) | Yes | 87 | 56.9 |
| | No | 66 | 43.1 |
| Do your relatives compete? (Mother) | Yes | 7 | 4.6 |
| | No | 146 | 95.4 |
| Do your relatives compete? (Father) | Yes | 14 | 9.2 |
| | No | 139 | 90.8 |
| Do your relatives compete? (Siblings) | Yes | 60 | 39.2 |
| | No | 93 | 60.8 |
| Do you like to compete? | Yes | 134 | 87.6 |
| | No | 19 | 12.4 |
| Do you usually compete? | Yes | 83 | 54.2 |
| | No | 70 | 45.8 |

Note: *N*, Sample; *Min.*, Minimum; *Max*., Maximum; *M*, Mean; *SD,* Standard Deviation.

the sample universe) was collected. Concerning the age of the subjects, the rules indicate that students from any cycle of primary education can participate. However, on this occasion, the schools selected only students from grades 5 and 6 (10–12 years old) (Table 1). More specific data can also be found in Table 1 in relation to the competitive practice of participants' relatives, as well as in relation to previously exposed data. Data collection was carried out during the 2021 edition of the Andalusian Olympic Foundation's Mini Olympics (2021).

**Instruments**

For the evaluation of the main study variables, a structured questionnaire battery was constructed composed of different scales. Specifically, we used:

– Sociodemographic data questionnaire: To obtain sociodemographic data from participants in this study, an ad hoc questionnaire was designed that included questions related to sex, age, habitual sports practice, sport practised, competitive experience (external to educational centre and in Physical Education classes) and family sports practice (father, mother or siblings).

– SAS-2 Competitive Anxiety Questionnaire (Ramis et al., 2010). This questionnaire is used to evaluate athletes' competitive anxiety. It is composed of 15 items divided into three dimensions: somatic anxiety, worry and distraction. A four-point Likert scale is used, where 1 means 'nothing' and 4 'a lot'. The values of each dimension are obtained by adding the scores obtained in the different items that make up each dimension, leading to total obtain values between 5 and 20. Obtaining low/high values in the sums of each dimension means that there is low/high somatic anxiety, worry and/or distraction. This questionnaire is validated and has demonstrated its reliability in the field of sports through the works of several authors (Bohórquez and Checa, 2017; Ramis et al., 2010)

**Procedure**

As previously mentioned, after taking part in several editions of the Mini Olympics and having different experiences with the participants, the event organizers and the Andalusian Tennis Federation (in charge of one of the activities) agreed to the development of this study. After their approval, we contacted the different schools and physical education teachers responsible for the students selected to participate in the Mini Olympics, to present the proposal and ask for their permission and that of the parents/guardians/legal guardians of the students themselves. On the first day of the Mini Olympics, specifically before the start of the mini-tennis test, after approval by all involved parties and the corresponding informed consent process was completed and accepted, we administered a questionnaire to all participants. This took place in the presence of responsible physical education teachers and the author of this study, in order to resolve any possible doubts that existed. The questionnaire was administered on paper, and a pencil/pen was provided for its completion. The instructions indicated that participation was completely voluntary, that the questionnaire should be completed individually, and that anonymity and confidentiality of the data would be guaranteed at all times. The data were collected on May17, 2021.

This research followed the ethical guidelines set out in the Ethical Principles and Standards for Developmental Scientists of the Society for Research in Child Development; in the Ethical Principles of Psychologists and Code of Conduct of the American Psychological Association, and in the Declaration of Helsinki.

**Data Analysis**

The current study followed a descriptive survey model, which is a quantitative research method. After the data were collected, the databases were cleaned up and the data were dumped into SPSS (IBM, 2017), relevant information regarding the sociodemographic data was obtained through frequency analysis. Likewise, through a descriptive analysis of three variables that make up competitive anxiety (somatic anxiety, worry and distraction), values were determined in relation the to competitive anxiety levels of Mini Olympics participants. Subsequently, normality tests were carried out to determine the distribution of the sample, and a non-normal distribution was obtained. Therefore, we opted for non-parametric mean comparison analysis for independent groups U of Mann-Whitney to determine influence of family sports practice (mother, father and siblings), competitive habits relatives (mother, father and siblings), taste for competition and competitive experience of participants on competitive anxiety levels (somatic anxiety worry distraction) of participants using a significance level of $p < .05$.

# Results

Competitive anxiety levels represent average values of around 10.80 points out of 20. If we attend to the three variables that make up the competitive anxiety construct, worry represents the highest values $M = 13.87$ $SD \pm 3.82$, followed by somatic anxiety $M = 10.17$ $SD \pm 3.84$, and lastly distraction $M = 8.35$ $SD \pm 2.70$. Table 2 presents descriptive statistics obtained from Mini Olympics participants in this study.

In this way, it can be asserted that participants in the Mini Olympics manifest a medium level of competitive anxiety, with higher values of participants' worry and representing statistically significant values in terms of competitive experience and its direct impact on participants' distraction.

Regarding somatic anxiety (Table 3), the highest values are manifested in participants who do not like to compete (M = 11.53; SD ± 3.98) and the lowest in subjects whose mothers compete (M = 9; SD ± 2.83). As for worry, the highest values are those related to participants whose siblings regularly compete (M = 14.50; SD ± 3.99), while the lowest are indicated by subjects who do not like to compete (M = 12.95; SD ± 4.71). On the other hand, distraction represents the highest values in subjects without competitive experience (M = 8.99; SD ± 2.82) and the lowest in those who do have it (M = 7.82; SD ± 2.49).

In order to determine the influence of family sports practice (mother, father and siblings), competitive habits of relatives (mother, father and siblings), taste for com-

**Table 2.** Competitive anxiety levels ofMini Olympics participants' tennis modality.

| | | *N* | *Mín.* | *Máx.* | *M* | *SD* | *Skewness* | | *Kurtosis* | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | *Value* | *SE* | *Value* | *SE* |
| Before or while I play or compete… | | | | | | | | | | |
| Somatic anxiety | … I feel my body is tense | 153 | 1.00 | 4.00 | 2.33 | 0.91 | 0.10 | 0.20 | -0.81 | 0.39 |
| | … I feel a knot in my stomach | 153 | 1.00 | 4.00 | 2.02 | 0.99 | 0.62 | 0.20 | -0.68 | 0.39 |
| | … I feel my muscles trembling | 153 | 1.00 | 4.00 | 1.90 | 1.01 | 0.83 | 0.20 | -0.46 | 0.39 |
| | … I have an upset stomach | 153 | 1.00 | 4.00 | 1.80 | 0.95 | 1.17 | 0.20 | 0.51 | 0.39 |
| | … I feel my muscles tense because I'm nervous | 153 | 1.00 | 4.00 | 2.12 | 0.96 | 0.42 | 0.20 | -0.81 | 0.39 |
| | **TOTAL** | **153** | **5.00** | **20.00** | **10.17** | **3.84** | **0.71** | **0.20** | **-0.23** | **0.39** |
| Worry | … I'm worried about not playing or competing well | 153 | 1.00 | 4.00 | 2.79 | 1.03 | -0.19 | 0.20 | -1.22 | 0.39 |
| | … I'm worried about disappointing others (teammates, coaches, parents, etc.) | 153 | 1.00 | 4.00 | 2.88 | 1.04 | -0.39 | 0.20 | -1.12 | 0.39 |
| | … I'm worried about not competing or playing as well as I can | 153 | 1.00 | 4.00 | 2.75 | 1.01 | -0.17 | 0.20 | -1.13 | 0.39 |
| | … I'm worried about competing or playing badly | 153 | 1.00 | 4.00 | 2.61 | 1.10 | -0.12 | 0.20 | -1.31 | 0.39 |
| | … I'm worried about screwing up during the game or competition | 153 | 1.00 | 4.00 | 2.84 | 1.01 | -0.25 | 0.20 | -1.16 | 0.39 |
| | **TOTAL** | **153** | **5.00** | **20.00** | **13.87** | **3.82** | **-0.03** | **0.20** | **-0.93** | **0.39** |
| Distraction | …I have trouble concentrating on the game or competition | 153 | 1.00 | 4.00 | 1.78 | 0.64 | 0.22 | 0.20 | -0.63 | 0.39 |
| | … I have trouble focusing on what I'm supposed to do | 153 | 1.00 | 4.00 | 1.73 | 0.89 | 1.13 | 0.20 | 0.51 | 0.39 |
| | … I lose concentration in the game or competition | 153 | 1.00 | 4.00 | 1.52 | 0.72 | 1.24 | 0.20 | 0.89 | 0.39 |
| | … I can't think clearly during the game or competition | 153 | 1.00 | 4.00 | 1.61 | 0.83 | 1.24 | 0.20 | 0.82 | 0.39 |
| | … I have trouble concentrating on what my coach has asked me to do | 153 | 1.00 | 4.00 | 1.71 | 0.87 | 1.17 | 0.20 | 0.70 | 0.39 |
| | **TOTAL** | **153** | **5.00** | **20.00** | **8.35** | **2.70** | **0.90** | **0.20** | **0.43** | **0.39** |

Note: *N*, Sample; *Min.*, Minimum; *Max*., Maximum; *M*, Mean; *SD,* Standard Deviation; SE, Standard Error.

petition, and competitive experience of participants on their competitive anxiety (somatic anxiety, worry and distraction), Mann-Whitney U mean contrast tests for independent groups were used (Table 3). The results indicate that sports practice, relatives' competitive habits and taste for competition did not influence any of the three components of competitive anxiety. However, mother's sports practice (U = 2408, p = .071) and taste for competition (U = 951.50, p = .074) represented results close to significance, so they should be taken into account in relation to their influence on somatic anxiety and, therefore, on competitive anxiety. Nevertheless, previous competitive experience of Mini Olympics participants did generate statistically significant differences in terms of distraction (U = 2086.50, p = .004), without affecting somatic anxiety or worry; specifically, those participants with previous competitive experience had less distraction than those without competition experience.

## Discussion

The objective of this work was to determine the influence of the Mini Olympics phase of the Olympism in School programme of the Andalusian Olympic Foundation on competitive anxiety perceived by participants. In this sense, the literature reveals that analysis of competitive anxiety in childhood is a current and popular topic of investigation (Arnau et al., 2018; Bois et al., 2009; Bohórquez and Checa, 2017; Borges et al., 2020; García-Mas et al., 2011; Grossbard et al., 2007; Grossbard et al., 2009; Pérez-Cáceres et al., 2021; Pluhar et al., 2019; Ramis et al., 2013).

Firstly, Hypothesis 1 indicated that participants will perceive intermediate levels of competitive anxiety. The results obtained in this work indicate that Mini Olympics participants manifest intermediate values in competitive anxiety, obtaining the highest values in worry, followed by somatic anxiety and distraction. These results are consistent with the scientific literature, as several authors indicate the predominance of worry over somatic anxiety and distraction (Núñez et al., 2020; Pulido et al., 2019; Ramis et al., 2013). Other authors also highlight the relevance of worry over the other two components of competitive anxiety, but emphasise the prevalence of somatic anxiety over distraction (Arnau et al., 2018; Borges et al., 2020; Bohórquez and Checa, 2017). Thus, Hypothesis 1 is partially accepted. The relevance of worry could be linked to the sense of belonging participants may feel towards their schools and their team, being motivated by that worry, by external evaluation of achievements obtained and/or a self-evaluation linked to performance, and not to task.

Subsequently, it was hypothesised that there would be differences in competitive anxiety of participants based on sports practice (Hypothesis 2), competitive habits of

**Table 3.** Influence of family sports practice, relatives' competitive habits, competitive experience and taste for competition of participants VS competitive anxiety (somatic anxiety, worry and distraction).

| | | Somatic Anxiety | | | | Worry | | | | Distraction | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | *M* | *DT* | *U* | *p* | *M* | *DT* | *U* | *p* | *M* | *DT* | *U* | *p* |
| Do your relatives play sports? (Mother) | Yes | 9.51 | 3.52 | 2408 | 0.071 | 13.51 | 3,82 | 2656 | 0.373 | 8.04 | 2.45 | 2603 | 0.275 |
| | No | 10.71 | 4.02 | | | 14.17 | 3,81 | | | 8.61 | 2.88 | | |
| Do your relatives play sports? (Father) | Yes | 9.96 | 3.91 | 2650 | 0.394 | 13.51 | 3,57 | 2542,5 | 0.211 | 8.21 | 2.46 | 2810.5 | 0.796 |
| | No | 10.4 | 3.77 | | | 14.26 | 4,06 | | | 8.51 | 2.94 | | |
| Do your relatives play sports? (Siblings) | Yes | 10.32 | 3.98 | 2485 | 0.878 | 14.06 | 3,8 | 2248 | 0.265 | 8.24 | 2.82 | 2288.5 | 0.34 |
| | No | 9.97 | 3.67 | | | 13.62 | 3,88 | | | 8.5 | 2.53 | | |
| Do your relatives compete? Mother) | Yes | **9** | 2.83 | 439 | 0.528 | 13.57 | 2,94 | 487 | 0.833 | 8.29 | 2.14 | 494 | 0.881 |
| | No | 10.23 | 3.88 | | | 13.88 | 3,86 | | | 8.36 | 2.73 | | |
| Do your relatives compete? (Father) | Yes | 10.79 | 3.17 | 805.5 | 0.311 | 13.43 | 2,21 | 899 | 0.668 | 8.07 | 1.94 | 965.5 | 0.997 |
| | No | 10.11 | 3.91 | | | 13.91 | 3,94 | | | 8.38 | 2.77 | | |
| Do your relatives compete? (Siblings) | Yes | 10.38 | 4.17 | 2517 | 0.99 | **14.5** | 3,99 | 2087,5 | 0.79 | 8.27 | 3 | 2296 | 0.36 |
| | No | 10.03 | 3.63 | | | 13.46 | 3,66 | | | 8.41 | 2.5 | | |
| Do you like to compete? | Yes | 9.98 | 3.8 | 951.5 | 0.074 | 14 | 3,68 | 1116,5 | 0.385 | 8.34 | 2.71 | 1214 | 0.742 |
| | No | **11.53** | 3.98 | | | **12.95** | 4,71 | | | 8.47 | 2.67 | | |
| Do you usually compete? | Yes | 10.22 | 4.1 | 2821 | 0.875 | 14.04 | 3,85 | 2745,5 | 0.661 | **7.82** | 2.49 | 2086.5 | **0.004** |
| | No | 10.11 | 3.53 | | | 13.67 | 3,8 | | | **8.99** | 2.82 | | |

Note: *M*, Mean; *SD*, Standard Deviation; *U*, Mann-Whitney U; *p*, significance

their family (mother, father and siblings) (Hypothesis 3), and taste for competition (Hypothesis 4). The results obtained in this study indicate that the null hypotheses must be maintained in both cases and, therefore, we must reject Hypotheses 3, 4 and 5. In none of the three cases were statistically significant differences obtained in any of the components of competitive anxiety (somatic anxiety, worry and distraction). The results are corroborated by those revealed in the literature and that are in the same line of enquiry (Bohórquez and Checa, 2017), although Bois et al. (2009) indicated that the presence of parents during competition was understood as a factor eliciting anxiety. Likewise, parental support can be linked to sports practice and/or their competitive experience, which could cause a perception of negative parental support (competitive anxiety in childhood) and/or positive (positive emotions in competition/training) (Atkins et al., 2015; Bohórquez and Checa, 2017; Hellstedt, 1990). However, although the results have not shown statistically significant differences, mother's sports practice ($U = 2408$, $p = .071$) and taste for competition ($U = 951.50$, $p = .074$) represented values close to significance in the somatic anxiety component. Linking this with all previous research, sports practice should continue to be encouraged among the population and, in this case, that of women should be promoted, as it has an impact on the competitive anxiety of their children. In addition, these results indicate that schools should perhaps attend to criteria linked to taste for competition in their selection of athletes in order to avoid exposure to anxiety and/or to create programmes/projects that provide tools for its control and for promoting healthy mental habits in the student population.

Finally, Hypothesis 5 indicated that there would be differences in competitive anxiety of participants based on their previous competitive experience. The results obtained in this study showed that there were statistically significant differences in terms of distraction based on previous competitive experience, without obtaining significant values on somatic anxiety or worry. Therefore, Hypothesis 5 will only be accepted for the distraction component. However, as has been extensively shown throughout this work, competitive anxiety is composed of three components, so it would be inappropriate to extrapolate these results to the whole construct. In this way, the results are in line with those found by various authors (Arnau et al., 2018; Jones, 1995; Pozo, 2007), who indicated that experience in competition did not affect competitive anxiety, being influenced by acquired competitive level and interpretation thereof. However, Núñez et al. (2020) found that it is possible that years of experience influence the perception of anxiety and performance. Likewise, other authors indicated in previous studies on adults that greater competitive experience would influence competitive anxiety values by reducing them (Hammermeister and Burton, 1995; Mellalieu et al., 2004). As Borges et al. (2020) have shown, early experiences in competition are of vital importance, as they could define ways of coping with competitive stress and condition its interpretation and motivation towards competition.

## Conclusions

The analysis of competitive anxiety perceptions of Mini Olympics participants has shown that they perceive intermediate levels of competitive anxiety (with greater weight given to the worry factor), and that this was greater in children who were not used to competition or who did not usually enjoy it.

Family sports and competitive practice, as well as taste for competition, do not influence competitive anxiety of Mini Olympics participants, although mother's sports practice and taste for competition are very close to being determinant. As for competitive experience, the values obtained in terms of distraction were significant. Therefore, it is very important that the organisers of Mini Olympics take into account the profile of participants and the possible psychological burden that could be induced in them, and that mental health levels could be counterproductive to their aims. In addition, it is of vital importance to develop intervention programmes on competitive anxiety of participants, so that they are prepared for their participation and enjoyment.

## Limitations and Future Lines of Research

Although this work is not without its limitations, they can be understood as opportunities for growth and are specified in future research lines. The first limitation concerns data analysis exclusively linked to family sports practice and own sports tastes/experience. These results could entail a bias of information, since there are other factors that affect competitive anxiety that have not been analysed in this work (e.g. influence of teachers, gender, etc.). Thus, in future work linking MiniOlympics and competitive anxiety, the influence of teachers should also be addressed and a more detailed analysis should be carried out based on gender. One could also understand as a possible limitation the lack of an analysis that included the differences by gender. This fact is seen as an opportunity and a possible future line of research.

Another limitation of this work is linked to the analysis of competitive anxiety in the tennis sports modality, since the literature has shown that individual sports represent higher levels of competitive anxiety than athletes from collective modalities (Pluhar et al., 2019). For this reason

and because Mini Olympics consist of both individual and collective sports, the results of this work cannot be understood as definitive and should not be generalised. In future works, a broader study should be developed in which the competitive anxiety of Mini Olympics participants is analysed in different tests and thus be able to carry out a deeper and more exhaustive analysis.

Finally, as a future line of work, the need for the development of an intervention programme for control and training on competitive anxiety in Mini Olympics participants is evident. It has been shown that many participants never participated in competitive activities before the development of the Mini Olympics, so representing their educational centre and their lack of competitive experience could entail great anxiety for them. Therefore, implementing an intervention programme on competitive anxiety could generate benefits on competitive anxiety shown by participants.

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# The Importance of Sports Participation on Lithuanian Adolescents' Social and Emotional Health

**Authors' contribution:**

A) conception and design of the study
B) acquisition of data
C) analysis and interpretation of data
D) manuscript preparation
E) obtaining funding

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## Abstract

Global mental health rates are staggering. Youth mental health in sport is a topic with increasing research attention. To date, most youth sport research examines mental health from isolated events as opposed to a cumulative-assets framework. Our main research question examined sport participation group differences regarding four mental health domains; emotional competence, belief-in-others, belief-in-self, and engaged living, and the composite covitality meta-indicator. To answer our research questions, 1965 Lithuanian youths (60.10% female) ranging in age from 11 to 17 ($M$ = 13.62, $SD$ = 1.96) from urban and rural school districts completed our survey. Our results indicated many significant differences ($p < 0.001$) emerged for participant sex, age grouping, and sport participation (competitive, leisure, or none). Only for the sport participation were the MANOVA and ANOVA effect size values at least small in magnitude. In the follow-up analyses (all $p$'s $< 0.001$), the competitive group differed from the no sport group (effect sizes medium-to-large) and to the leisure participant group (effect sizes small) in all four mental health domains and the meta-indicator covitality. Small-to-medium effect size values resulted between the leisure and no sport groups. Sport participation, even for leisure, is related to improved self-reported social and emotional health in our large sample. The practical implication is clear that all governments and such bodies should provide accessible and affordable sport participation opportunities, whether competitive or recreational. Longitudinal research, as a future direction in sport contexts, will help to best understand and move forward with youth mental health.

**Keywords:** adolescents, physical activity, competitive athletics, covitality, mental health

## Introduction

A leading worldwide disability cause is mental health, with a 2019 pre-COVID estimate of 970 million people (WHO, 2022). Of pre-COVID-19 global mental health disabilities, 13% were accounted for by 10- to 19-year-olds, which equates to one in seven stricken with a mental health disorder (WHO, 2021). The prevalence of poor mental health reported in youth has increased during and since the COVID-19 pandemic as suggested by a recent review that reported a staggering statistic that 31% of youth are suffering self-reported symptoms of depression and anxiety (Deng & Fan, 2022) in comparison to the 21% reported in the initial pandemic phase (Racine et al., 2021). Physical activity is a safe and accessible treatment option which can be implemented in a wide range of the population with minimal risk as an effective intervention in treating adult mental health, specifically anxiety and

depression symptoms (Singh et al., 2023). Furthermore, physical activity helps to treat depressive symptomatology in youth and adolescents (Recchia et al., 2023).

Specific to our investigation, we examined adolescent sport participation, a common form of physical activity worldwide (Aubert et al. 2022; Emmonds et al. 2023). To date, most youth and adolescent sport research examines mental health from isolated events (e.g., anxiety management) as opposed to a cumulative-assets framework (e.g., a composite mental health indicator) (Furlong et al., 2014). To address this shortfall in mental health assessment, our main aim was to examine sport participation within a cumulative-assets framework measuring social and emotional health indicators in Lithuanian adolescents recruited from urban cities and rural towns. As a result of reviewing the academic literature, we hypothesized sport participants would self-report greater social and emotional health on the Social and Emotional Health Survey – Secondary Students (SEHS-S, Furlong et al., 2014) dispositions and overall meta-indicator termed covitality. We also checked for age and sex differences along with all potential interactions of our categorical variables (sport participation, age group, and sex).

## Youth Sport Literature

For children and adolescents during leisure time, sports are rated as most important (Ntoumanis and Thøgersen-Ntoumani, 2012; Spruit et al., 2018, 2016). Across the globe in data combined pre- and post-COVID, less than half of youths and adolescents participated in a form of sport (Aubert et al. 2022). In European countries contributing to the Global Matrix 4.0 data set (Aubert, et al., 2022), around half of youth participate in some form of sport. Specific to our Lithuanian sample, 60–66% percent of youth were involved in some form of sport. In another large data collection across Europe, this one sampling sport club records, Emmonds and colleagues (2023) reported nearly 80% were boys. Of all sports, global statistics suggest soccer as the most popular sport (Hulteen et al., 2017). In short, playing sport is a common activity and one worth studying.

An assumption of youth development research is that by participating in sport programs characterized by the building of supportive relationships, youth may acquire positive life skills and transfer and utilize these skills in settings outside of sport (Jones & Lavallee, 2009). A number of skills are possible, ranging from creativity, managing moods, and teamwork, representing cognitive, emotional, and cooperative skills. The ability to communicate, listen to feedback, cope with stress, plan, solve problems, and deal with setbacks are additional skills learned via sport programs (Papacharisis et al., 2005). Danish and his colleagues (2005) asserted many years ago that the transfer of skills from sport to life is the best sport value.

Pertinent to our research, organized sport and mental health meta-analyses and large-scale studies are found in the literature. For instance, Boelens and colleagues (2021) conducted an umbrella review of meta-analyses that examined the effects of sport programs on participants' mental health. Across the six reviewed meta-analyses, Boelens et al. (2021) reported organized sport activities regardless of types provided a positive effect, albeit small, on youth and adolescents' mental well-being. Compared to non-sport activities, the authors concluded limited evidence supporting any impact on mental health. Hence, though small in effect, organized sport appears to be more beneficial than non-sport activities to the mental health of children and adolescents. From a parental standpoint, Hoffmann et al. (2022) reported on parent/guardian ($N$ = 11,235) self-rated perceptions of the relationship between organized sport, both team and individual, and a number of mental health constructs via the Child Behavior Checklist questionnaire (ASEBA / Research Center for Children, Youth and Families at www.aseba.org) compared to non-sport activities. Based on the parent ratings of their children, the results indicated team sport participation compared to non-sport participation was related to less mental health symptomatology. In contrast, individual sport participation compared to non-sport participation was related to *more* mental health symptomatology. Hence, Hoffmann and colleagues (2022) interpreted the results as being consistent with past research and the common belief that team sport participation is a potential mechanism to improve mental health. In summary, sport participation is related to improved mental health. The findings concerning individual sport participation, while concerning, are from the parent perspective and not the participating youths' perspective. Furthering the youth sport and mental health research agenda is important with a comprehensive measure of health, both emotional and social.

## Social and Emotional Health Measurement in Adolescents

Mental health measurement in youth is popular from various perspectives. Measurement of negative mental health in youth has been very common in the education system, whereas positive mental health has not been regularly measured (Furlong et al., 2014). After it was discovered that the same adolescents who reported few occurrences of mental distress also reported lower levels of well-being, it was evident that a unidimensional model of psychological health was not satisfactory and a bidimensional model was needed (Furlong et al., 2014). Further-

more, a cumulative-assets framework measuring subjective well-being was found to be a more accurate predictor of behaviors and relationships in youth than an isolated asset framework (Furlong et al., 2014). This measure, the Social and Emotional Health Survey-Secondary (SEHS-S), is a cumulative-assets framework developed from the pre-existing social and emotional scale, the Resilience Youth Development Module (RYDM: (Hanson & Kim, 2007)). The three highest factor loaded items of each subscale of the RYDM were included in seven of the 12 SEHS-S positive-psychological construct subscales; the remaining five SEHS-S subscales initially included all items due to limited information on factor structure and item loading. The SEHS-S now includes 36 single-item questions.

The SEHS-S considers an adolescent's internal assets and external resources to predict well-being and life outcome qualities, and is different from traditional adolescent behavior surveys in that it measures positive mental health and skill sets rather than focusing on negative mental health and risk factors (Furlong et al., 2014). The SEHS-S measures positive mental health in adolescents using 12 first-order psychological building blocks that contribute to four positive-mental health domains: belief-in-self, belief-in-others, emotional competence, and global life engagement. Each disposition includes unique sub-scales that represent positive mental health (Furlong et al., 2014). The belief-in-self domain consists of self-efficacy, self-awareness, and persistence; the belief-in-others domain includes school support, peer support, and family support; emotional competence consists of emotion regulation, empathy, and behavioral self-control; and engaged living embraces gratitude, zest, and optimism. The four domains comprise the meta-indicator termed covitality (Furlong, 2014). The research literature contains a number of SEHS-S validation studies in the English language (Furlong et al., 2023; You et al., 2014, 2015). For our sample, we utilized the Lithuanian validated SEHS-S (Petrulytė et al., 2019).

Of great importance is the relationship between covitality and a number of critical behavioral, cognitive, and psychological constructs as covitality is predictive of positive and negative behavior across student age groups. Furlong and colleagues (2014) reported covitality related to students' self-reported subjective well-being, school achievement, safety perceived while at school, fewer depressive symptoms, and reduced usage of tobacco, alcohol, and marijuana. Continuing to provide evidence of the importance of covitality, You and colleagues (2014) reported with a large high school sample that the meta-indicator positively predicted end of semester grade point average and negatively correlates with psychological distress. Furthermore, covitality predicts adaptability and internalizing symptoms in college students and prosocial behavior in elementary school students (Furlong et al., 2014; Jones et al., 2013). Petrulyte and colleagues (2019) reported covitality related in the hypothesized positive direction with the following important constructs: empathic concern, self-esteem, and perspective-taking.

# Materials and Methods

### Participants

Study participants were volunteers attending 12 high schools in cities ($n$ = 7) and rural ($n$ = 5) Lithuanian school districts. Students completed the survey in the 2021–2022 academic year between December 18, 2021, and January 9, 2022. This time period was between the third medium-sized pandemic wave and the start of the largest wave in Lithuania. We invited all students in the 12 high schools to complete our survey. The initial sample totaled 2031 students. After eliminating submitted surveys with participants indicating ages greater than 17 ($n$ = 66), the final sample for this investigation totaled 1965 (60.10% female of total sample). The participants' ages ranged from 11 to 17 ($M$ = 13.62, $SD$ = 1.96). We coded the participants by sex, age, and sport participation to address our main research questions. We defined younger adolescents from 11 to 13 years of age (49.70% of total sample) and older from 14 to 17 years of age (50.30% of total sample). Across the three sport participation groups, 41.40% of the participants indicated competitive sport (52.60% females; 72.40% older adolescents), 36.80% leisure sport (61.40% females; 60.70% older adolescents), and the final 21.80% indicated no sport participation (72.20% females; 53.00% older adolescent) of any kind.

### Instrumentation

Participants completed the SEHS-S and demographic questions. Developed by Furlong et al. (2014), the SEHS-S questionnaire includes a number of psychological dispositions, both social and emotional, associated with youth development from a positive perspective. Petrulyte and colleagues (2019) provided the Lithuanian version for the current research. The questionnaire consists of four dispositions/scales: belief-in-self, belief-in others, emotional competence, and engaged living. Each disposition consists of three sub-scales. The belief-in-self consists of self-efficacy, self-awareness, and persistence; the belief-in-others comprises school support, peer support, and family support; emotional competence consists of emotion regulation, empathy, and behavioral self-control; and engaged living embraces gratitude, zest, and optimism.

In the current study, the Cronbach reliability coefficients ranged from 0.68 to 0.90 with all but the one 0.68 (subscale persistence) greater than the traditional acceptable limit of 0.70. In total, there are 36 items that are summed into the meta-construct of covitality.

The SEHS-S is scored on the following four-point scale: 1 = not at all true of me; 2 = a little true of me; 3 = pretty much true of me; and 4 = very much true of me. Examples of SEHS-S items are as follows: *I can wait for what I want.*; *Each day I look forward to having a lot of fun.;* and *I feel bad when someone gets their feelings hurt.* All SEHS-S questions in English are found in Furlong and colleagues' (2014) publication.

Concerning demographic information, participants self-selected sex by indicating male or female, self-reported their age by typing in their age, and self-selected sport participation by selecting one of the following responses: Yes, I do sports, I attend sports training 2–3 times a week and participate in competitions; Yes, I do sports in my spare time, but I do not aim for a sports result, I do not participate in competitions; or No, I do not play sports or attend any of sports club. Though participants might train for competitions and engage in recreational activities, they were allowed to choose only one sport participation response.

**Procedure**

The lead Lithuanian author contacted Lithuanian schools and explained to the appropriate school administrator our research aims and questionnaires. Ethical approval was provided by Vytautas Magnus University ethics committee (SA-EK-21-09). The Lithuanian researchers provided the 12 school administrators with the approved ethical forms to distribute to parents, the youths, and classroom teachers. At the beginning of each school year, parents at each school provide signed consent for school approved research projects, media consent (e.g., child is in a school photo), and such activities. Before any data collection, parents received notification via the online school system where parents see their children's records (e.g., academic grades and health records) that the current study was approved. The participants were allowed to either complete or not complete the questionnaire at the time of administration in their school's information technology room. One of the Lithuanian researchers was present and explained the research and that participation was voluntary. Participant consent was via completing (submitting) their questionnaire.

**Data analysis**

We performed data analyses using Intellectus Statistics (https://intellectusstatistics.com/), SPSS version 26.0. (IBM, Chicago, IL, USA), and Comprehensive Meta-Analysis (CMA) version 3 software (version 3.3.070, Biostat, Inc., Englewood, NJ, USA, 20 November 2014). To understand the SEHS-S questionnaire integrity, we examined descriptive data and reliability coefficients for each of the four dispositions/scale subscales. As part of our initial data analyses, we checked for univariate outliers in the total SEHS score (i.e., covitality) and multivariate outliers across the SEHS-S dispositions. After checking for outliers, we examined the correlations among our pandemic metrics and the SEHS-S. Next, we conducted an ANOVA on the meta-construct of covitality by our categorical variables (sex, age group, and sport participation) with appropriate follow-up tests. To examine whether differences existed in our categorical variables for the four SEHS dispositions, we conducted a MANOVA with appropriate univariate follow-up tests. To understand the meaningfulness within the ANOVA and MANOVA analyses, the partial eta-squared ($\eta^2 p$) and Cohen's (1990) guidelines of small (0.01), moderate (0.06), and large (0.14) for interpretation framed our interpretations. Our Hedges' g statistic interpretations followed Cohen (1990) from small (0.20–0.39) to medium (0.40 to 0.79), and large (> 0.80).

# Results

Summary statistics (see Table 1) were calculated for the SEHS-S subscales: self-efficacy, self-awareness, persistence, peer support, behavioral self-control, optimism, zest, empathy, family coherence, school support, emotion regulation, and gratitude; the four scales, belief-in-self, belief-in-others, emotional competence, and engaged living; and the total SEHS-S score of covitality. When the skewness exceeds 2 in absolute value, the variable is considered to be asymmetrical about its mean. When the kurtosis is greater than or equal to 3, then the variable's distribution is markedly different from a normal distribution in its tendency to produce outliers (Westfall and Henning, 2013). As found in Table 2, all skewness and kurtosis values fell well below the absolute cutoffs and were treated as normally distributed data.

**Univariate and multivariate outliers**

To identify influential points in the total SEHS-S scores, Studentized residuals were calculated, and the absolute values were plotted against the observation numbers (Field, 2017; Pituch & Stevens, 2015). Observations with a Studentized residual greater than 3.09 in absolute value, the 0.999 quantile of a $t$ distribution with 1964 degrees of freedom, were considered to have significant influence on the results of the model. Two observations were removed. To identify influential points in the four SEHS-S model residuals, we calculated Mahalanobis distances and compared them to a $\chi^2$ distribution (Newton & Rudestam, 2012). As outlined by Kline (2016), we defined an outlier as any Mahalanobis distance that exceeded 18.47, the 0.999 quantile of a $\chi^2$ distribution with 4 degrees of freedom. There were 11 observations detected as outliers. Thus, in total, we deleted 13 total cases from our analyses.

**Table 1.** Summary statistics for SEHS-S scales

| Variable | *M* | *SD* | Min | Max | Skewness | Kurtosis | *Median* |
|---|---|---|---|---|---|---|---|
| Self-efficacy | 8.59 | 1.90 | 3.00 | 12.00 | -0.21 | -0.29 | 9.00 |
| Self-awareness | 8.50 | 2.25 | 3.00 | 12.00 | -0.32 | -0.51 | 9.00 |
| Persistence | 7.74 | 2.17 | 3.00 | 12.00 | -0.04 | -0.54 | 8.00 |
| School support | 7.78 | 2.59 | 3.00 | 12.00 | -0.04 | -0.92 | 8.00 |
| Family coherence | 9.46 | 2.41 | 3.00 | 12.00 | -0.71 | -0.41 | 10.00 |
| Peer support | 8.33 | 2.93 | 3.00 | 12.00 | -0.24 | -1.12 | 9.00 |
| Emotion regulation | 8.90 | 2.01 | 3.00 | 12.00 | -0.39 | -0.22 | 9.00 |
| Empathy | 8.96 | 2.32 | 3.00 | 12.00 | -0.49 | -0.39 | 9.00 |
| Behavioral self-control | 8.48 | 2.02 | 3.00 | 12.00 | -0.21 | -0.37 | 9.00 |
| Gratitude | 9.75 | 3.24 | 3.00 | 15.00 | -0.42 | -0.73 | 10.00 |
| Zest | 9.61 | 3.43 | 3.00 | 15.00 | -0.40 | -0.75 | 10.00 |
| Optimism | 8.25 | 2.61 | 3.00 | 12.00 | -0.20 | -0.85 | 9.00 |
| Belief-in-self | 24.84 | 5.10 | 9.00 | 36.00 | -0.13 | -0.24 | 25.00 |
| Belief-in-others | 25.56 | 5.76 | 9.00 | 36.00 | -0.20 | -0.50 | 26.00 |
| Emotional competence | 26.35 | 5.25 | 9.00 | 36.00 | -0.35 | -0.02 | 27.00 |
| Engaged living | 27.61 | 7.87 | 9.00 | 42.00 | -0.31 | -0.57 | 29.00 |
| Covitality | 104.36 | 19.60 | 36.00 | 150.00 | -0.17 | -0.10 | 105.00 |

**Covitality results**

The results of the ANOVA were significant, $F$ (11, 1,940) = 19.14, $p < 0.001$, indicating there were significant differences in total SEHS-S score (i.e., covitality) among the levels of our categorical variables. No interactions were of statistical significance (i.e., $p < 0.05$), and the corresponding effect size values were all 0. Concerning our main effects, the main effects for Sex and Age were not significant. However, the main effect for sport participation was significant, $F(2, 1{,}940) = 76.82$, $p < 0.001$, $\eta^2 p = 0.07$, indicating there were significant differences in covitality by the sport participation levels. A $t$-test was calculated between each group combination to further examine the differences among the levels of sport participation. The Tukey HSD $p$-value adjustment was used to correct for the effect of multiple comparisons on the family-wise error rate. As depicted in Figure 1, the mean of covitality for competitive sport participation ($M = 109.48$, $SD = 17.82$) was significantly larger ($p < 0.001$) than the leisure participation group ($M = 105.13$, $SD = 18.16$) and ($p < 0.001$) the no sport ($M = 94.00$, $SD = 20.35$) participation group. The covitality score for leisure sport participation was significantly larger ($p < 0.001$) than that for no sport participation. The difference between the competitive sport group and the no sport group was large ($g = 0.83$), while the difference with the leisure sport group was small ($g = 0.24$). The covitality difference was medium ($g = 0.59$) between the leisure sport and no sport groups.

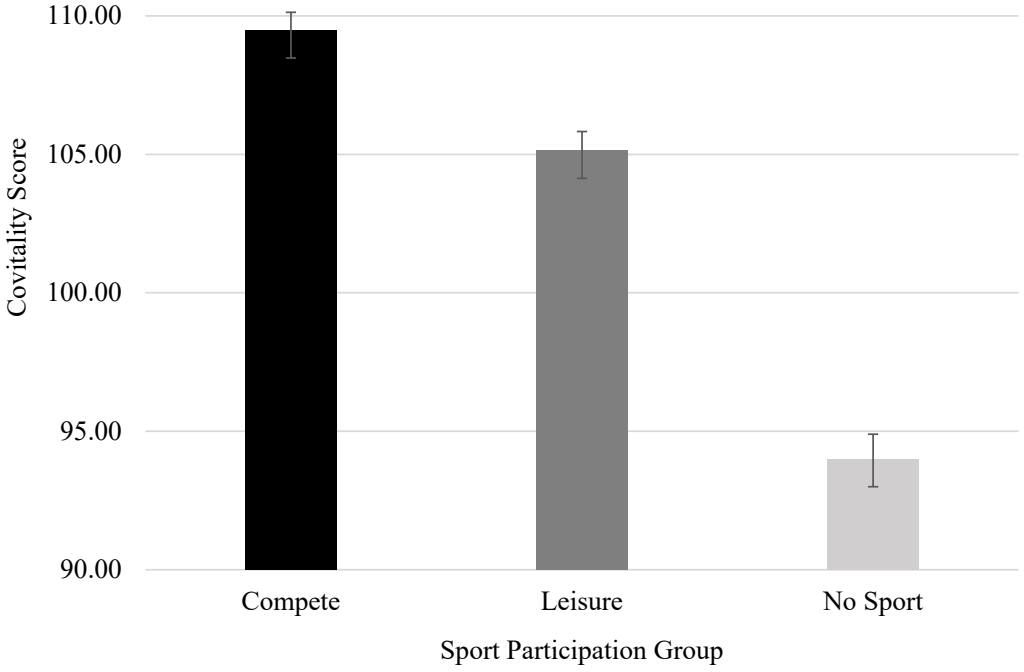


**Figure 1.** Mean covitality scores with standard error bars by sport participation groups

**SEHS-S disposition scale results**

To test for significant differences in the SEHS-S scales linear combination (i.e., belief-in-self, belief-in-others, engaged living, and emotional competence) between the levels of our categorical variables (i.e., sex, age, and sport participation), we conducted a MANOVA. A correlation matrix was calculated to examine multicollinearity between the dependent variables. All variable combinations had correlations less than 0.62 in absolute value, indicating the results are unlikely to be significantly influenced by multicollinearity. Given the large sample and ease of achieving statistical significance, we presented only differences with $\eta^2p > 0.01$. The MANOVA results indicated no meaningful interactions or main effects for sex and age group. The main effect, for sport participation group, was significant, $F(4, 1954) = 42.04$, $p < 0.001$, $\eta^2p = 0.08$. To further examine the significant MANOVA main effects, an ANOVA was conducted for each SEHS-S scale (see Table 2). Significant and small to medium in meaningfulness differences resulted for only sport participation across all four SEHS-S disposition scales: belief-in-self, $F(2, 1940) = 63.52$, $\eta^2p = 0.06$; belief-in-others, $F(2, 1940) = 33.91$, $\eta^2p = 0.03$; engaged living, $F(2, 1940) = 80.35$, $\eta^2p = 0.08$; and emotional competence, $F(2, 1940) = 27.85$, $\eta^2p = 0.03$.

Figure 2 depicts the means of each group for the four SEHS-S dispositions. The effect size values between the sport and no sport groups ranged from small to large, with covitality and engaged living being the largest ($g = 0.91$) in meaningful effect size values. The leisure compared to no sport group effect size values ranged from small to medium, with covitality and engaged living being the medium effect size values. Negligible to small (covitality, belief-in-others, and engaged living) effect size values resulted for the competitive sport and leisure sport comparisons.

**Table 2.** ANOVA results for SEHS-S total score and scales for the sport participation groups

| | | **Descriptive Statistics** | | | | **Difference Statistics** | | |
|---|---|---|---|---|---|---|---|---|
| SEHS-S Domain | Groups | *M* | *SE* | *LL* | *UL* | $F(2, 1940)$ | *p* | $\eta^2p$ |
| Belief-in-Self | Compete | 26.57 | 0.20 | 26.19 | 26.96 | | | |
| | Leisure | 25.78 | 0.21 | 25.37 | 26.19 | | | |

| | | Descriptive Statistics | | | | Difference Statistics | | |
|---|---|---|---|---|---|---|---|---|
| | No Sport | 23.59 | 0.27 | 23.06 | 24.12 | 63.52 | < 0.001 | 0.06 |
| Belief-in-Others | Compete | 26.17 | 0.17 | 25.84 | 26.51 | | | |
| | Leisure | 24.82 | 0.18 | 24.46 | 25.17 | | | |
| | No Sport | 22.39 | 0.23 | 21.93 | 22.84 | 33.91 | < 0.001 | 0.03 |
| Engaged Living | Compete | 29.90 | 0.26 | 29.39 | 30.41 | | | |
| | Leisure | 27.85 | 0.28 | 27.30 | 28.39 | | | |
| | No Sport | 23.06 | 0.36 | 22.36 | 23.76 | 80.35 | < 0.001 | 0.08 |
| Emotional Competence | Compete | 29.90 | 0.26 | 29.39 | 30.41 | | | |
| | Leisure | 27.85 | 0.28 | 27.30 | 28.39 | | | |
| | No Sport | 23.06 | 0.36 | 22.36 | 23.76 | 27.85 | < 0.001 | 0.03 |

Note. *M* = mean; *SE* = standard error; *LL* = 95% confidence interval lower limit; *UL* = 95% confidence interval upper limit; $\eta^2p$ = partial eta-squared.

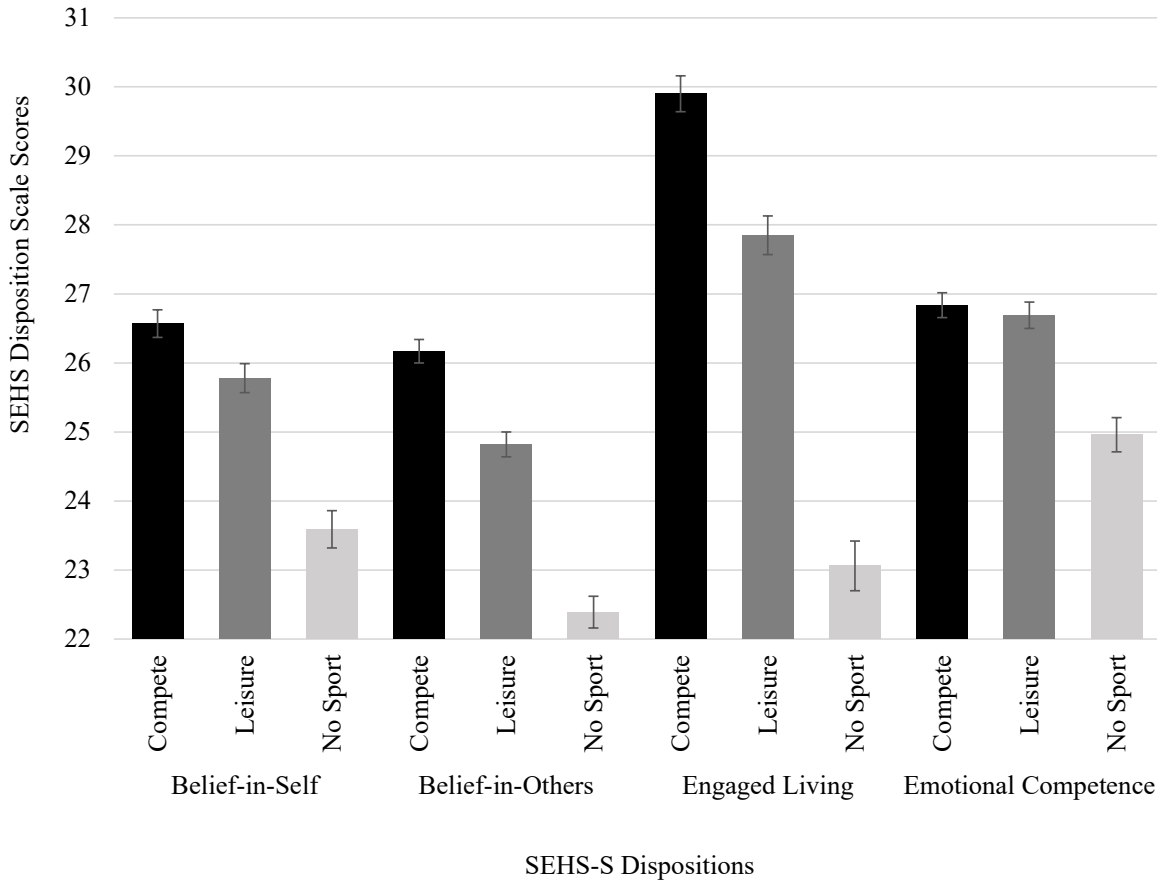


**Figure 2.** Mean SEHS-S disposition scores with standard error bars by sport participation groups

## Discussion

This research investigated whether social and emotional health as measured by the SEHS-S Lithuanian version differed by levels of sport participation. We also investigated whether participant self-reported sex and age impacted the SEHS-S scores after checking on the relationship of three pandemic metrics to the SEHS-S Lithuanian version. To date, our research is the first to examine differences in the SEHS-S in a sport domain and thus push the literature forward using a bidimensional model of mental health as opposed to the traditional unidimensional model. Our most meaningful differences, all being significant as well, concerned our sport participation categorical variable and not our other categorical variables for all the SEHS-S first-order domains and well as the covitality meta-construct. Thus, our results supported and furthered the physical activity and mental health literature. Given there is no sport research with the SEHS-S to our knowledge, our discussion focuses on placing our results into the broader context of the importance of each measured construct in sport and other life contexts.

Of the first-order domains, the largest overall effect sizes and between sport participation groups (i.e., competitive vs. leisure, competitive vs. no sport, leisure vs. no sport), resulted for the engaged living and belief-in-self domains. Engaged living consists of optimism, zest, and gratitude and belief-in-self consists of self-awareness, self-efficacy, and persistence. From the competitive sport literature, higher self-ratings of many of these constructs relate to desired outcomes. For instance, optimism is related to long-term injury recovery (Williams et al., 2020) and better sport performance (Ortín-Montero et al., 2018). Zest, analogous to vigor, is predictive of competitive sport performance (Lochbaum et al., 2021) as self-efficacy is predictive of competitive sport performance (Lochbaum et al., 2023; Moritz et al., 2000). Lastly, persistence is a valued and required behavior to achieve in sport and in all achievement endeavors and thus, is included in achievement motivation theories such as achievement goal theory (Duda & Nicholls, 1992; Lochbaum & Roberts, 1993). Without luck, the achievement of challenging tasks is difficult without persistence. Hence, competitive sport provides opportunities to build these important beliefs, moods, and behaviors.

What is critical is the extension of these beliefs, moods, and behaviors to other domains (e.g., academics) and even to adulthood per the youth sport literature that the benefit is transferring sport benefits to other domains (Danishet al., 2005). For instance, from published meta-analyses, optimism relates to physical health, both subjective and objective, in adulthood (Rasmussen et al., 2009). Self-efficacy is an important predictor of school performance (Talsma et al., 2018). Dispositional gratitude correlates with both positive and negative mental well-being indicators, such as happiness and depression. In a recent study, Hao, De France, and Evans (2022) demonstrated that persistence on a challenging task accounted for variance between the childhood poverty and mental health (worsening over the lifespan) relationship. As the literature points out, a number of the SEHS-S constructs, found within engaged living and belief-in-self first-order measures, relate to important sport and life outcomes.

To a lesser extent, meaningfulness and significant differences resulted between the two sport participation groups and the non-sport group across the other two first-order domains, belief-in-others and emotional competence. Belief-in-others consists of school support (e.g., a teacher who cares), family coherence (e.g., we get along together), and peer support (e.g., friend helps during hard times). The exact mechanism by which competitive sport and leisure sport participants in our study perceived more meaningful school support, family coherence, and peer support is unknown. Intentionality could be the important mechanism, as intentional youth development programs provide youth with experiences that prioritize the development of personal and social life skills, along with the physical development associated with sport participation (Gordon et al., 2016). Shared experiences might be another mechanism, as Prochnow and colleagues (2002) followed youth sport participation and friendships at a summer camp. At the first measurement, sport and time with friends related to each being involved in sport but overtime this relationship did not hold. Though it could be the time sport requires from parents (e.g., transportation) and team interactions, youth outside of sports make friends, have families who love them, and teacher support.

Emotional competence is the last of the four first-order domains for discussion. The SEHS-S emotional competence domain consists of emotional regulation, self-control, and empathy. The competitive and leisure sport participants did not differ on emotional competence, but both did differ when compared to the non-sport participants. Emotional competence, unquestionably, is critical to human development. Given the prevalence of psychological disorders in adolescents and that emotional regulation strategies relate to these disorders plus a number of others such as eating disorders (Aldao et al., 2010), development of emotional competence is of great importance specific to mental health. Psychological interventions improve youth emotional regulation (Moltrecht et al., 2019). Pertinent to sport, empathy is positively related to prosocial behaviors across a wide variety of participants (>71,000) from many countries and cultures, with the effect size for junior high students being larger than that of high school students (Yin & Wang, 2023). In a large German adult sample surveyed within the recent pandemic, Hajek and König (2022) reported engaging in physical activity pur-

suits impacted the level of self-reported empathy. Last, across various physical activity and health measures in adults, trait self-control is related, albeit small in effect size magnitude, to self-reported eating, sleep, and physical activity (Andrade & Hoyle, 2023). Whether our sport and leisure participants' sport programs included emotional competence information is unknown to us. However, taken together and scored in a meta-indicator, competitive sport participants differed from leisure sport participants in most of the first-order domains while both groups differed from participants who indicated no sport participation.

## Limitations and Future Directions

Limitations exist in our work given the cross-sectional and non-random (i.e., convenience sampling) selection design, even with a large participant sample. Bias is inherent in convenience sampling. In our data, sampling older adolescents was more convenient. It is unknown as to what bias or biases the higher percentage of older adolescents introduced to our results. Our sampling method was intentional in that we sampled across Lithuania. However, personal acquaintances between researchers and school administrators perhaps impacted our school selections. Again, whether introducing biases impacted our results is unknown. Another limitation with our study is we are unsure as to how many participants began the survey but did not submit the survey. Likewise, whether the intended participant completed the survey is unknown. This concern is minimal, as completing a friends or family members survey for no monetary benefit seems devoid of any motivation and thus reason to do so. Last, not including more health-related outcomes such as subjective well-being and even physical activity attitudes limited our interpretations as to the full impact of sport participation.

Even with the above-mentioned limitations, our results demonstrated the importance of sport participation on social and emotional health components; thus, we suggest future research focus on implementing longitudinal research methodology. Youth move in and out of sport, whether for leisure or competition, across a year. Given we know youths drop out of sport participation, longitudinal research with the same participants could capture whether a cause-and-effect relationship exists between sport participation and social and emotional health. Past research in Finland (Zanatta et al., 2018) with a large sample ($N$ = 824) of athletes over a four-year time period demonstrated the importance of longitudinal research in that motivation constructs at the individual and climate level predicted continuance of sport participation. Though Zanatta and colleagues' research looked to better understand elite athletes, longitudinal research of the majority of youth sport participants who will never become an elite athlete is of great value. Determining whether a measure such as the SEHS-S predicts lifelong sport participation would further research in physical activity participation, and determining whether youth sport participation predicts improved social and emotional health in adulthood would further research in understanding social and emotional health development.

Our last future research suggestion is expanding upon the sport participation options. For instance, Kallinen et al. (2019), researching Finnish youth sport participation and motivations, included five sport participation options. Two of those options were dropping out of competitive or non-competitive youth sport programs. Thus, we suggest longitudinal research for the previously mentioned reasons along with capturing dropping out of youth sport to better understand our sport participation and social and emotional health findings.

## Conclusions

Youth mental health is an ever expanding and researched area across a number of domains such as education, developmental psychology, and school systems. We examined youth mental health in the sport domain using the SEHS-S Lithuanian version (Petrulytė et al., 2019). Competitive sport participation participants compared to the other participant groups reported greater overall cumulative mental health as well as higher scores in the four individual indicators (belief-in-self, belief-in-others, engaged living, and emotional competence). Of the indicators, the engaged living differences between the competitive sport and the non-sport and leisure sport groups were the most meaningful. An improved understanding of reasons underlying the sport and social and emotional health relationship will help improve delivery of youth sport programs at the grassroots and more competitive levels. To aid in this research as stated in Aubert and colleagues (2022), all countries should provide more sport participation opportunities by creating national policies, such as in Denmark, to improve sport accessibility. By doing so, improved mental health via sport programs will result for youth worldwide.

**Competing interests**

No competing interests.

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