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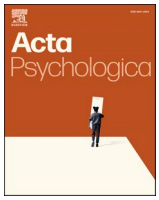

The quality of life of competitive and recreational Spanish surfers and para surfers

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ABSTRACT

Background: Physical exercise is known to enhance both physical and mental health. Surfing, an emerging water sport practiced in "blue space", offers unique well-being benefits, including for individuals with disabilities through Para-Surfing.
Methods: This study analyzed the Quality of Life (QoL) among 146 Spanish participants (126 Surfers and 20 Para-Surfers), comparing competitive and recreational modalities, reasons for engagement, and the relationship between sociodemographic factors, surf practice, and QoL.
Results: Overall, participants reported high scores QoL. Despite the absence of discernible global disparities in Global QoL attributable to practice or surfing modality, Para-Surfers exhibited comparatively diminished QoL in the Physical Health and Level of Independence (PHLI) domain relative to Surfers. The predominant reasons for engaging in surfing activities among the study participants encompassed the enhancement of both mental and physical well-being, augmented personal autonomy, and the fulfillment derived from personal challenges. However, competitive Surfers and Para-Surfers were more likely to highlight performance and recognition as key motivators. Notably, recreational surfers who valued social connections reported higher QoL, unlike competitive surfers who placed less importance on these relationships. For Para-Surfers, equipment adaptation was significantly associated with better overall QoL, as well as improvements in psychological health and spirituality (PHS).
Conclusion: The findings underscore the importance of aligning individual motivations with the type of surf practice to maximize QoL benefits. For Para-Surfers, access to safe, enjoyable, and adapted equipment is essential. Promoting surfing as a health-enhancing activity should consider both personal goals and structural support to optimize QoL outcomes.

1. Introduction

A substantial body of evidence from around the world demonstrates that exercise has positive effects on the physical and mental health of the general population (Cantón, 2001; Eather et al., 2023; Martín-Rodríguez et al., 2024; Rehn et al., 2013; Romero et al., 2009; Sivaramakrishnan et al., 2024). Research indicates that regular physical activity (PA) can function as a preventative measure against the development of various physical diseases, reducing the risk of occurrence by 26% (Aguirre Chávez et al., 2024) including hypertension (Diaz & Shimbo, 2013; Rehn et al., 2013), comorbidities of obesity (Pojednic et al., 2022), metabolic syndrome (Myers et al., 2019) and type II diabetes (Aune et al., 2015; Reiner et al., 2013; Smith et al., 2016). Reviews of the empirical literature on the role of PA in mental health revealed that PA had a significant positive effect on the mental health of both adults (Eather et al., 2023) and adolescents (Rodríguez-Ayllon et al., 2019). PA can even have a positive effect on the prevention of mental illness, can reducing the risk of depression (Abu-Omar et al., 2004; Cantón, 2001; Caracuel & Arbinaga, 2010; Pearce et al., 2022; Wang & Ashokan, 2021) and anxiety (Abu-Omar et al., 2004). In a therapeutic way, including improvements in anxious and depressive symptoms (Franco Gallegos et al., 2025; Mahindru et al., 2023; Rebar et al., 2015) and the symptoms of post-traumatic stress disorder in adults (Wang & Ashokan, 2021).

Furthermore, an expanding body of quantitative (Cantón, 2001; Rengifo et al., 2024; Vita et al., 2020) and qualitative (Graham et al., 2008) research substantiates the positive impact of PA on mental health

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in particular demographics, including individuals grappling with chronic conditions or disabilities.

In consideration of the QoL, defined by the World Health Organization as "individuals' perceptions of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns" (WORLD HEALTH ORGANIZATION, 1998), empirical evidence suggests that individuals engaging in sports and PA exhibit higher QoL compared to their non-active counterparts. This phenomenon has been observed across different populations, including adults (Jürgens, 2006; Kang et al., 2016), and individuals with disabilities (Nemček, 2016; Zheng et al., 2023).

A substantial body of research has been dedicated to examining the relationship between participation in water sports and QoL (Zhou et al., 2021) psychological well-being (Jackson et al., 2022) and mental health (Lloret et al., 2023). In addition, substantial empirical evidence has been demonstrated that highlights the benefits of exercising in a natural context or space (Pretty et al., 2005), particularly in "blue spaces" and "blue gyms" (Britton et al., 2020; Britton & Foley, 2021). Indeed, studies have shown that the mental health benefits of water-based PA are more pronounced when performed in outdoor settings compared to indoor environments (Foley & Kistemann, 2015).

Surfing has emerged as a popular sport in the 21st century, with participation reaching 23 million in 2004 and 35 million in 2013 (Ponting & O'Brien, 2015). This activity is typically performed in aquatic environments characterized by blue spaces, such as oceans and seas. Surfing is defined as an aquatic sport in which an individual rides waves while standing—or adopting other positions—on a surfboard. The individual harnesses the wave's energy and trajectory to achieve forward motion and execute manoeuvres. Surfing is classified by board type and wave characteristics, including Surf, Bodyboard, Longboard, SUP, and Paddleboard (ISASURF, n.d.-b). Surfing can be practiced in a competitive or recreational capacity. In recent years, however, it has also been used for therapeutic purposes (International Surf Therapy Organization, n.d.). Para-surfing is a variant of surfing in which individuals with physical, vision, or intellectual impairments partake (ISASURF, 2024; Johnson & David, 2022) The current classification system in para-surfing comprises nine categories (ISASURF, 2024), seven of which are designated for athletes with physical impairments (Stand 1, Stand 2, Stand 3, Kneel, Sit, Prone 1, and Prone 2) and two for athletes with vision impairments (Vision Impairment 1 and Vision Impairment 2). Presently, athletes with intellectual impairments are not allowed to participate in para-surfing competitions according to ISA Para Surfing Classification. Para-surfing has grown significantly, especially in the last decade. The first Adaptive Surfing Championship in 2015, organized by the ISA (International Surfing Association)— a recognized global governing body for surfing as established by the International Olympic Committee— hosted 69 athletes from 18 countries. By 2023, it had expanded to 180 athletes from 27 countries (ISASURF, n.d.-a).

Surfing, specifically, is a water-based PA that can be carried out in a variety of blue spaces (surf spots, river surfing and artificial waves). It has the potential to offer benefits to a diverse population, including young people (Rocher et al., 2020; Silva et al., 2022), adults (Elmahdy et al., 2024), and individuals with disabilities (Youngson et al., 2023). The benefits perceived by surfers include self-satisfaction, enjoyment, self-gratification, recreation, and personal enrichment (Barbieri & Sotomayor, 2013). It has been demonstrated that surfing constitutes an efficacious therapeutic intervention in the physical, psychological, and social health (Benninger et al., 2020), particularly for vulnerable populations, including individuals with disabilities (Clapham et al., 2014; Gibbs et al., 2022; Moore et al., 2018), at-risk youth (McKenzie et al., 2021) and military veterans (Rogers et al., 2014; Walter et al., 2019) in particular, have demonstrated enhanced subjective well-being (Caddick et al., 2015; Matos et al., 2017) and QoL (Nemček, 2016; Pérez-Rodríguez et al., 2021; Pucci et al., 2012).

The abundance of literature on the therapeutic effects of surfing on vulnerable populations contrasts with the lack of literature on its effects on recreational or competitive athletes. Despite there is also empirical evidence indicating that sports participation—both at recreational and competitive levels— may be associated with the presence of various mental disorders. For example, athletes may be at increased risk of experiencing conditions such as anxiety, depression, eating disorders, and sleep disturbances (Reardon, 2021).

In this sense, the principal aim of the present study is to conduct an exploratory analysis, with the objective of examining the socio-demographic characteristics and surf practices of a sample of Spanish para-surfers and surfers. The study will explore their quality of life (QoL) in both competitive and recreational contexts.

2. Methods

2.1. Participants and study design

Participants in this cross-sectional study included 146 surfers, of whom 96 (65.8%) were male and 50 (34.2%) were female. All participants were from Spain. Of these, 114 respondents (78.6%) reported that it takes them one hour or less to reach the training venue, while 31 respondents (21.4%) indicated that it takes two hours or more. The mean age of the participants was 32.3 years (±12.0, range 16–57 years). A total of 126 participants (86.3%) did not report any disability (Surfers), while 20 (13.7%) participants reported a visual or motor disability (Para-Surfers). Among those who reported a disability, 16 (80%) identified it as motor-related, while four (20%) reported a visual disability. Of the participants, 109 (74.7%) were Recreational Surfers (not involved in any kind of competition), with an average of 11.78 years of practice (±9.64, range 0–30 years), while 37 (25.3%) were Competitive Surfers (involved in local, regional, national, international, and/or world competitions), with an average of 7.89 years of practice (±7.66, range 1–30 years). Please refer to Figs. 1 and 2 for additional details.

A convenience sample was recruited for this study. Participants were required to be at least 16 years of age and to engage in surfing, either competitively or recreationally. The sample was non-random, purposive, and based on accessibility criteria. Despite the non-random nature of the sample, the study maintained a sampling error of no more than ±10 (León & Montero, 2020; Montero & León, 2007), as the sample size exceeded 100 participants. Regarding the subset of athletes or practitioners with disabilities, while precise data are not available, the number of participants with disabilities is higher than the theoretical sample universe, accounting for 13.70% of the total sample.

Prior to the collection of data, the study obtained ethical approval from the Research Ethics Committee of the University. All procedures involving human participants were conducted in accordance with the ethical standards established by the institutional and/or national research committees, as well as the 1964 Helsinki Declaration and its subsequent amendments or comparable ethical standards. Informed consent was obtained from all individual participants included in the study.

The data for this study were collected in Spain over a period of three months. Data collection was conducted using an online questionnaire administered through Sphinx iQ3. To reach the target population, the survey link was disseminated via social media platforms, including Facebook, LinkedIn, and WhatsApp. Additionally, the link was shared with Spanish Surf and Para-Surf entities for distribution to their respective members via email. The initial page of the survey questionnaire provided comprehensive information about the study, participants' rights, and the researcher's contact details. Participants were informed about the study's objectives and the procedures to be followed. After receiving this information, participants were asked to provide their consent to participate. Upon consenting, respondents were granted access to the remainder of the questionnaire. Incomplete responses were excluded from the analyses.

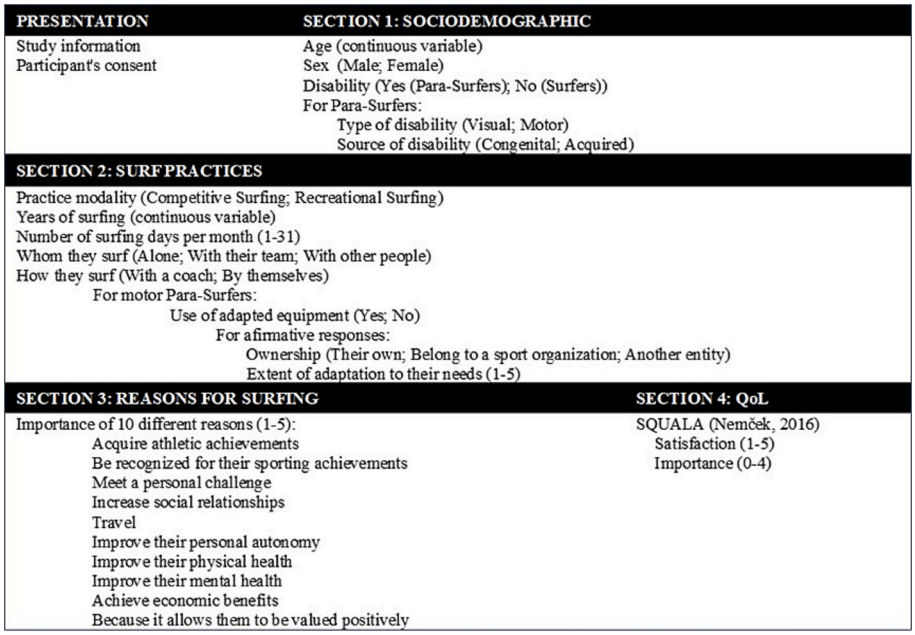


Fig. 1. Tools and process flowchart.

2.2. Instruments

The survey questionnaire, specifically designed for this study, encompassed the subsequent four sections (see Fig. 1).

2.2.1. Sociodemographic

The first section includes five questions regarding age (a continuous variable), sex (Male; Female), and whether participants have a disability (for Para-Surfers) or not (for Surfers). Para-Surfers were also asked to specify the type of disability (Visual; Motor) and the source of their disability (Congenital; Acquired).

2.2.2. Surf practices

The second section contained nine questions, three of which were specifically directed at Para-Surfers. In this section, participants were asked whether they engage in Competitive Surfing (involved in local, regional, national, international, and/or world competitions) or Recreational Surfing (not involved in any kind of competition) (a dichotomous variable) and how many years they have been surfing (a continuous variable). Surfers and Para-Surfers reported the number of days per month they practice (ranging from one to 31) and indicated with whom they surf (Alone; With their team; With other people) and how they surf (With a coach; By themselves). Para-Surfers with a motor disability were also asked whether they use adapted equipment for surfing (Yes; No). If they answered affirmatively, they were required to specify the ownership of the equipment (Their own; Belong to a sport organization; Another entity). Additionally, they were asked to assess the extent to which the equipment they use is adapted to their individual needs on a five-point scale (1 = Totally adapted; 5 = Not well adapted).

2.2.3. Reasons for surfing

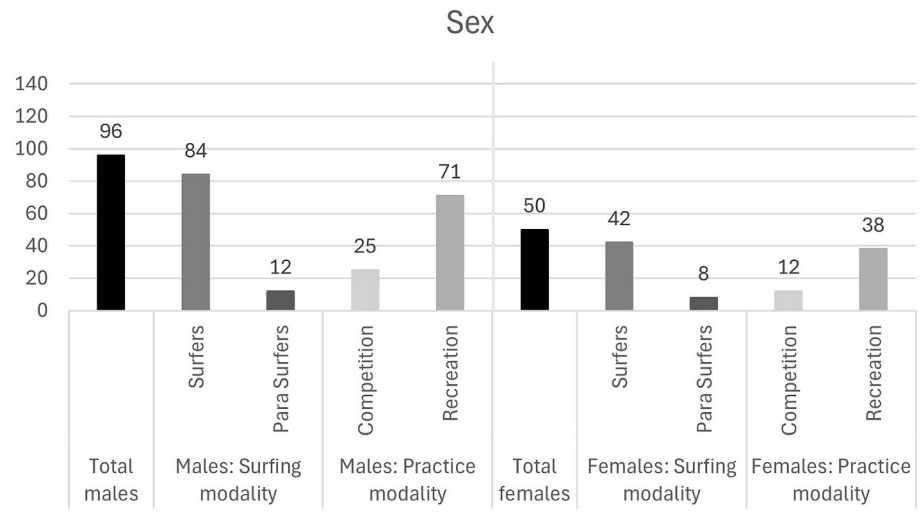
In the third section, all participants rated ten different reasons for surfing on a five-point Likert scale (1 = It's nothing important; 5 = It's very important). The reasons included: *Acquire athletic achievements*, *Be recognized for their sporting achievements*, *Meet a personal challenge*, *Increase social relationships*, *Travel*, *Improve their personal autonomy*, *Improve their physical health*, *Improve their mental health*, *Achieve economic benefits*, and *Because it allows them to be valued positively*.

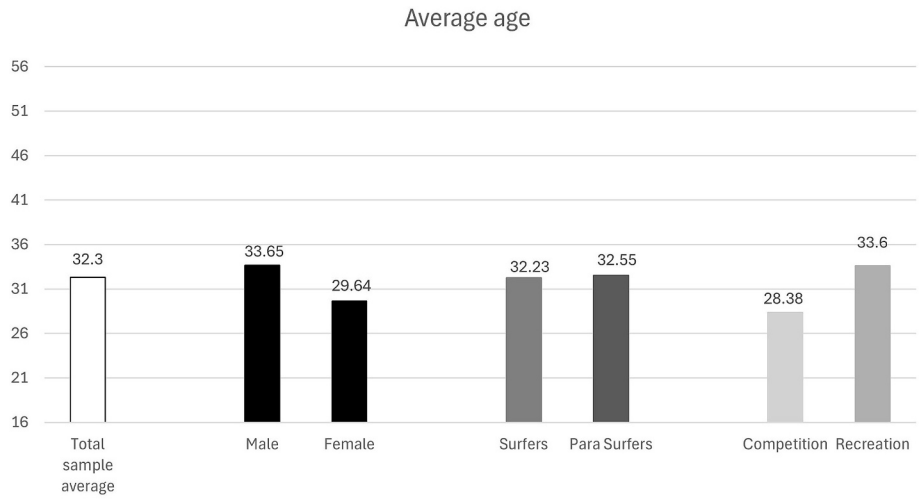
2.2.4. Quality of Life (QoL)

For the third section, we utilized a 23-item modified version (Nemček, 2016) of the Subjective Quality of Life Analysis (SQUALA (Zannotti et al., 1994)). This multidimensional self-assessment tool evaluates subjective quality of life across 23 life areas, defined as the product of the importance of the area and the corresponding level of satisfaction. Satisfaction is rated on a five-point scale, ranging from 1 (Very dissatisfied) to 5 (Completely satisfied). The importance of each area is also assessed on a scale from 0 (Irrelevant) to 4 (Essential). Results are presented as the overall Quality of Life (QoL) score ($\alpha = 0.85$), the sum of all items after multiplying the satisfaction score by the importance of each of the 23 items, and four QoL domains relating to WHO categorizations: Physical Health and Level of Independence (being healthy, feel physically well, good sleep, to have free time activities, being physically independent, take care of yourself, sport participation /exercising in leisure time, work; PHLI; $\alpha = 0.71$), Psychological Health and Spirituality (to love and to be loved, justice, beauty and art, truth, to be interested in politics, good food, to have faith/religion; PHS; $\alpha = 0.63$), Social Relationships (relationships in family, relationships with other people, to have and to raise children, to have sexual life; SR; $\alpha = 0.55$), and Environment (pleasant living environment, to be secure, freedom, money; E; $\alpha = 0.65$). Cronbach's α coefficients for each dimension were lower than those reported in the original scale: Physical Health and Level of Independence (PHLI; $\alpha = 0.82$), Psychological Health and Spirituality (PHS; $\alpha = 0.81$), Social Relationships (SR; $\alpha = 0.68$), and Environment (E; $\alpha = 0.80$) (Dragomirecka & Bartonova, 2006).

2.3. Statistical analysis

Statistical analysis was conducted using SPSS (v. 22) and G*Power (v. 3.1.9.7) (Faul et al., 2007). The following analyses were performed: analysis of central tendency (means) and dispersion (standard deviation), frequency analysis; analysis of mean differences between two independent samples employing the Mann-Whitney U statistic and the Chi-square test; calculation of statistical power and effect size; ANOVA; and assessment of test and factor reliability through the application of Cronbach's alpha coefficient (α). The use of non-parametric tests was necessary due to the variation in group sizes (Gómez-Gómez & Vega-Franco, 2003). ANOVA was employed to





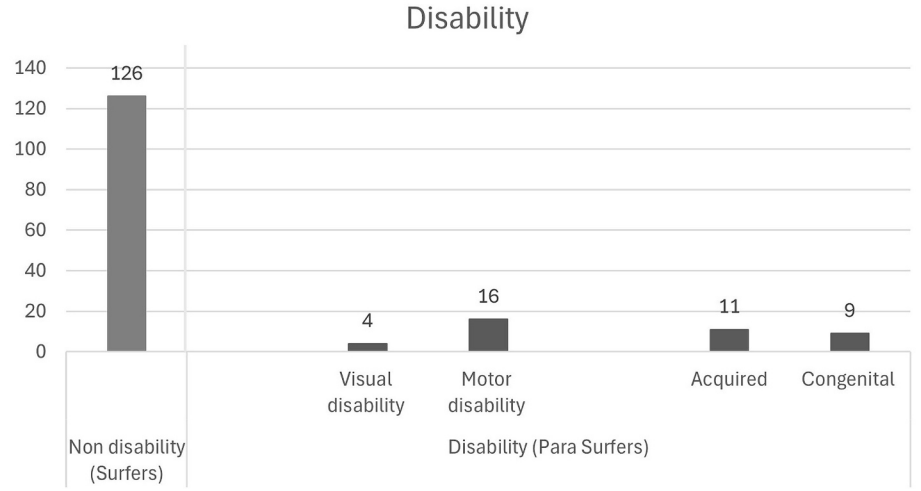


Fig. 2. Respondents' socio-demographic characteristics.

determine the main effects of independent variables on dependent variables. The Macro Process (Hayes, 2018) was utilized to conduct linear regression analysis and explore potential interactions among the variables under study. Main effects and two-way interactions were interpreted in the first and second steps of the analysis, respectively. The PROCESS add-on for SPSS was used to test the two-way interactions (Model 1) (Hayes, 2018).

3. Results

3.1. Sociodemographic profile

Fig. 2 shows the respondent's socio-demographic characteristics. All participants were from Spain. Of the male sample (96; 65.8% of the total sample), 84 participants were surfers (87.5%) and 12 (12.5%) were para surfers. Twenty-six percent (25) of the males practiced in a competitive modality, whereas 74% (71) practiced recreationally. Among females (50; 34.2%), 42 (84%) were surfers and 8 (16%) were para surfers. Twenty-four percent (12) of females practiced surfing competitively, while 76% (38) practiced the sport recreationally. A total of 126 participants (86.3%) did not report any disability (Surfers), while 20 participants (13.7%) reported a visual or motor disability (Para-Surfers). Among those who reported a disability, 16 (80%) identified it as motor-related, and four (20%) reported a visual disability. Additionally, 11 Para-Surfers (7.5%) reported their disability as acquired, compared to nine Para-Surfers who reported their disability as congenital.

The mean age of the participants was 32.3 years (± 12.0, range 16–57 years). The average age of male participants was 33.7 years (± 12.1), while that of female participants was 29.7 years (± 11.5). Surfers had an average age of 32.2 years (± 11.9), whereas para surfers averaged 32.6 years (± 12.6). Competitive surfers had an average age of 28.4 years (± 12.1), compared to 33.6 years (± 11.7) for recreational surfers.

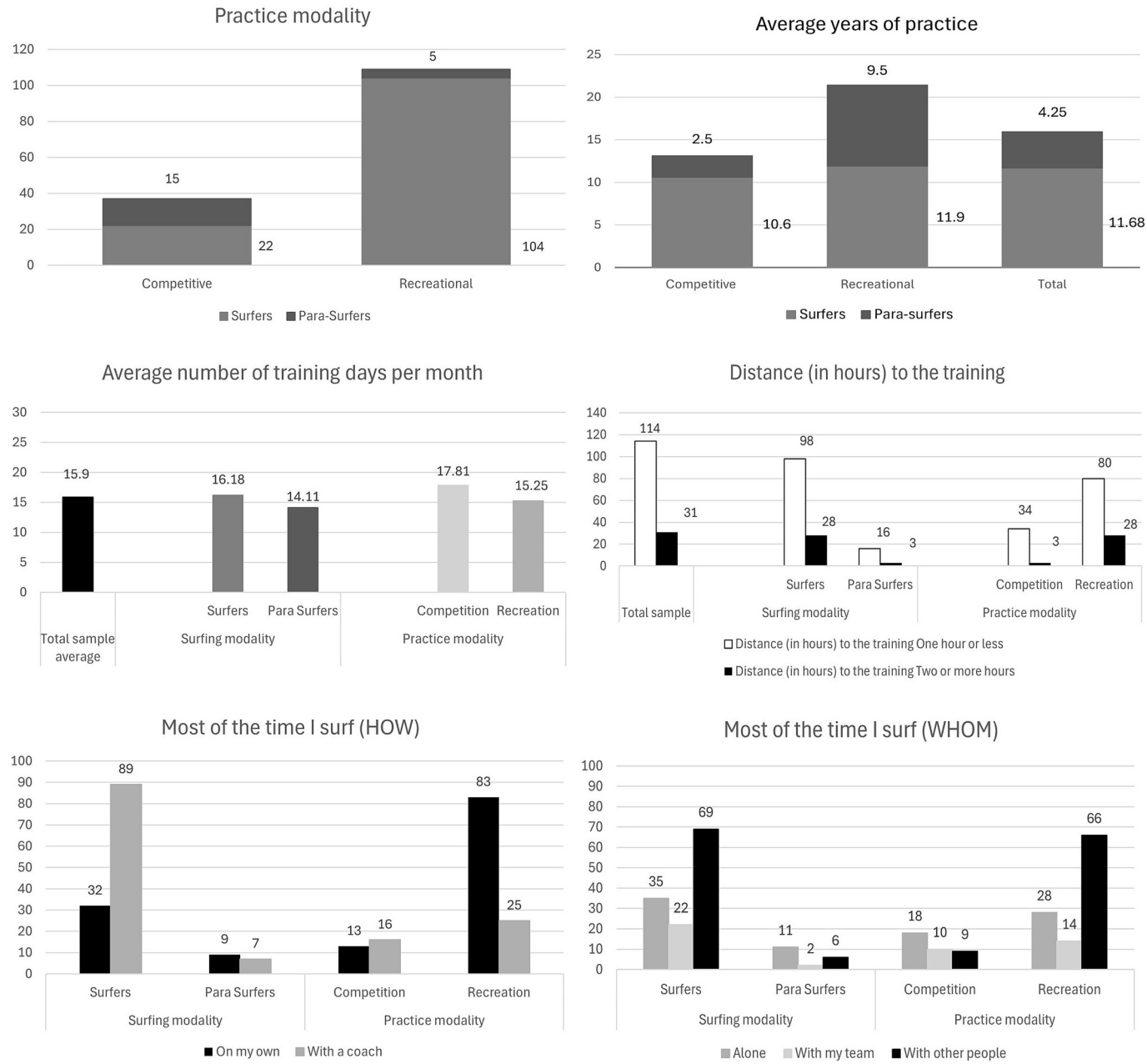


Fig. 3. Respondents' surf practices.

3.2. Surf practices

Fig. 3 presents the surfing practices of the respondents. Among the participants, 37 (25.3%) engaged in Competitive Surfing, while 109 (74.7%) participated in Recreational Surfing. Within the competitive group, 15 participants (40.5%) were Para-Surfers. In the recreational modality, five participants (4.6%) were Para-Surfers. Overall, all participants reported a mean of 10.71 years of practice (± 9.28, range 0–30). Recreational surfers ($11.78_{years} \pm 9.64$) practiced significantly longer than those in the competitive modality ($7.89_{years} \pm 7.66$), $U = 1350.0$, $p = .027$, $1 - \beta = 0.51$, $d = 0.45$. Surfers ($11.57_{years} \pm 9.17$) had significantly more years of training than Para-Surfers ($5.47_{years} \pm 8.34$), $U = 330.50$, $p < .001$, $1 - \beta = 0.13$, $d = 0.70$.

All participants reported surfing an average of 15.90 days per month (± 8.19, range = 1–31). No significant differences were observed when comparing Practice Modality (Competitive; Recreative) ($p = .11$) or Surfing Modality (Surfing; Para-Surfing) ($p = .33$).

When analyzing participants by Practice Modality, the results revealed significant differences in whom they surf with and how they practice ($\chi^2_{WHOM}(2) = 14.95$, $p < .01$, $1 - \beta = 0.78$, $d = 0.68$; $\chi 2_{HOW}(1) = 10.37$, $p < .01$, $1 - \beta = 0.33$, $d = 0.55$). A majority of Competitive Surfers reported practicing alone (51.4%), while most Recreational Surfers indicated that they practice with others (61.1%). Additionally, 51.4% of Competitive Surfers practiced with a coach, compared to only 23.1% of Recreational Surfers. No significant differences between these two variables were found when analyzed by Surfing Modality ($p > .08$).

Fifty-five point 6 % of Para Surfers used adapted equipment. Most of the adapted equipment used by motor Para Surfers was their own (80.0%), and they reported an average satisfaction rating of 1.80 (±0.79) on a scale of 1 to 3.

3.3. Reasons for surfing

The most common reasons were *Improve my mental health* (4.73 ± 0.52), *Improve my physical health* (4.61 ± 0.57), *Meet a personal challenge* (4.20 ± 0.86) and *Improve my personal autonomy* (4.15 ± 0.99).

We found that participants in the Competition Modality, compared to the Recreational Modality, reported higher scores for the reasons: *Acquire athletic achievements*, *Be recognized for my sporting achievements*, *Meet a personal challenge*, *Improve my personal autonomy*, *Improve my physical health*, and *Achieve economic benefits* ($p < .2$). Additionally, Para-Surfers, compared to Surfers, reported higher scores for the reasons *Acquire athletic achievements*, and *Be recognized for my sporting achievements* ($p < .01$; see Fig. 4 and Table 1 for more information).

3.4. Quality of life

Table 2 and Fig. 5 summarizes the participants' ratings with respect to the global QoL Index and its four dimensions. No differences in QoL (global index) were found when comparing participants' Practice Modality ($p = .62$) or Surfing Modality ($p = .33$). All Para-Surfers reported lower scores for QoL on the Physical Health and Level of Independence (PHLI) domain compared to Surfers ($U = 846.5$, $p = .04$, $1 - \beta = 0.45$, $d = 0.49$). No other differences in QoL domains were found when comparing participants' Practice Modality ($p > .52$) or Surfing Modality ($p > .48$).

There was no difference in any QoL scores ($p > .10$) between Para-Surfers with a motor disability who used adapted material and those who did not. However, among Para-Surfers who used adapted equipment, ratings of the global QoL index, PHS, and E domain correlated with how well the equipment was adapted to their individual needs ($r = -0.83$, $p < .01$; $r = -0.93$, $p < .01$, $r = -0.71$, $p < .05$, respectively). Thus, QoL scores were higher when the equipment was better adapted to their needs.

To conduct an exploratory analysis of the relationships between the variables, QoL (global index) and its four domains were subjected to hierarchical regression analysis, using Practice Modality (Competitive; Recreative) and each of the ten Reasons for Surfing (continuous) and their interactions as predictor variables, separately. Surfing Modality (Surfing; Para-Surfing) was included as a covariate.

The results showed no main effect of Practice Modality in any analysis of QoL (global index) ($p > .24$). The effects of the analysis of any

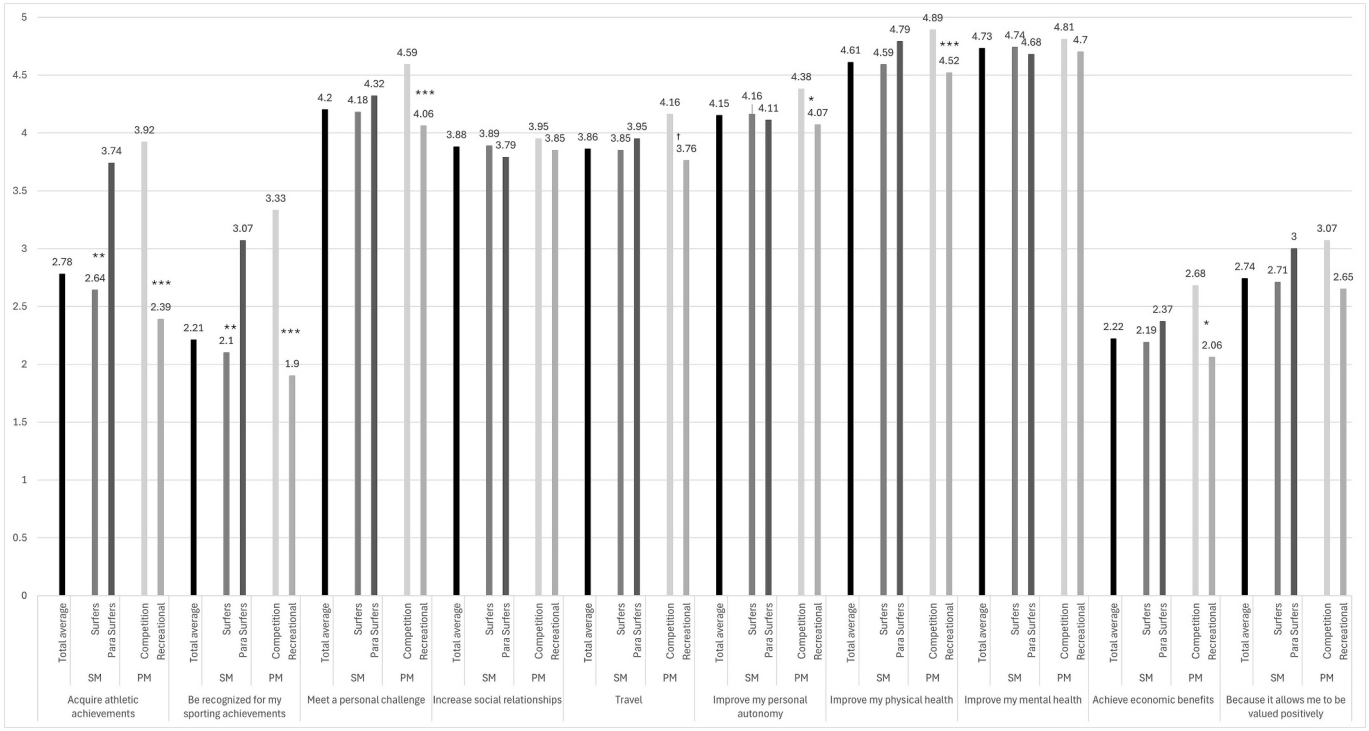


Fig. 4. Respondents' Reasons for Surfing scores. Note: †$p < .10$; *$p < .05$; **$p < .01$; ***$p < .001$. SM: Surf modality. PM: Practice modality.

Table 1
Respondent's reasons for surfing ($N = 146$).

Reasons for surfing	Mean (SD)	Z	U	p	1 – β	d
Acquire athletic achievements	2.78 (1.41)					
Practice modality		−5.62	791.5	0.000***	0.99	1.32
Surfing modality		−3.16	672.0	0.002**	0.69	0.92
Be recognized for my sporting achievements	2.21 (1.18)					
Practice modality		−5.35	468.5	0.000***	0.98	1.40
Surfing modality		−3.16	390.0	0.002**	0.59	0.98
Meet a personal challenge	4.20 (0.86)					
Practice modality		−3.53	1287.0	0.000***	0.33	0.69
Surfing modality		−0.55	1111.5	0.59	0.66	0.17
Increase social relationships	3.88 (0.95)					
Practice modality		−1.06	1784.5	0.29	0.35	0.10
Surfing modality		−0.04	1191.5	0.97	0.97	0.09
Travel	3.86 (1.06)					
Practice modality		−1.83	1615.5	0.07†	0.60	0.41
Surfing modality		−0.17	1169.0	0.86	0.87	0.10
Improve my personal autonomy	4.15 (0.99)					
Practice modality		−2.31	1528.5	0.02*	0.23	0.31
Surfing modality		−0.34	1143.0	0.73	0.73	0.05
Improve my physical health	4.61 (0.57)					
Practice modality		−3.60	1336.5	0.000***	0.49	0.77
Surfing modality		−1.43	994.5	0.15	0.55	0.39
Improve my mental health	4.73 (0.52)					
Practice modality		−1.58	1739.5	0.12	0.43	0.27
Surfing modality		−0.11	1182.5	0.91	0.92	0.10
Achieve economic benefits	2.22 (1.28)					
Practice modality		−2.46	1485.0	0.01*	0.44	0.48
Surfing modality		−0.83	1063.5	0.41	0.49	0.15
Because it allows me to be valued positively	2.74 (1.19)					
Practice modality		−1.64	1048.0	0.10	0.48	0.36
Surfing modality		−0.80	672.5	0.43	0.60	0.27

† $p < .10$.
* $p < .05$.
** $p < .01$.
*** $p < .001$.

Table 2
Respondent's Global QoL Index and four QoL domains scores (N = 146).

	Mean (SD)	*Z*	*U*	*p*	1 – β	*d*
Global QoL Index	214.26 (48.66)					
Practice modality		−0.49	1890.0	0.62	0.13	0.69
Surfing modality		−0.97	1031.5	0.33	0.23	0.51
PHLI	10.15 (2.45)					
Practice modality		−0.58	1870.0	0.56	0.11	0.62
Surfing modality		−2.05	846.5	0.04*	0.49	0.45
PHS	8.13 (2.23)					
Practice modality		−0.63	1858.0	0.53	0.13	0.62
Surfing modality		−0.70	1078.0	0.49	0.15	0.56
SR	9.71 (3.12)					
Practice modality		−0.64	1857.0	0.52	0.17	0.65
Surfing modality		−0.71	1076.5	0.48	0.18	0.58
E	10.12 (2.60)					
Practice modality		−0.55	1876.0	0.58	0.17	0.70
Surfing modality		−0.42	1126.0	0.68	0.06	0.69

†$p < .10$; *$p < .05$; **$p < .01$; ***$p < .001$. PHLI: Physical Health and Level of Independence, PHS: Psychological Health and Spirituality, SR: Social Relationships, E: Environment.

of the ten Reasons for Surfing on QoL were not significant ($p > .25$). Surfing Modality also had no effect on any of the analyses, $p > .19$.

Results revealed a two-way interaction between Practice Modality and Increase Social Relationships as a Reason for Surfing emerged on participants' QoL, $B_{QoL} = 21.19$, $t(140) = 2.35$, $p = .02$, 95% CI [3.38, 39.01], $1 - \beta = 0.64$, $f^2 = 0.06$; (Fig. 6, top panel). Among those who practiced Surfing Recreationally, a higher score for the reason *Increase social relationships* was associated with higher Global QoL Index scores compared to those with a lower score for this reason, $B_{QoL} = 11.39$, $t(140) = 2.23$, $p = .03$, 95% CI [1.28, 21.49], $1 - \beta = 0.70$, $f^2 = 0.06$. Among participants who reported fewer reasons for increasing social relationships (−1 SD), the Competitive Modality of surfing was associated with an increased QoL compared to the Recreational Modality, $B_{QoL} = -33.52$, $t(140) = -2.41$, $p = .02$, 95% CI [−61.04, −6.0], $1 - \beta = 0.64$, $f^2 = 0.06$. No other simple effects were found, $p > .19$.

The domain's analysis showed the same pattern of results for the Psychological Health and Spirituality (PHS), Social Relationships (SR), and Environment (E) QoL domains. In other words, the same two-way interaction between Practice Modality and *Increase in social relationships* emerged in participants' QoL domains ($p < .02$). Among those who practiced Surfing Recreationally, a higher score for the reason *Increase in social relationships* was associated with higher PHS (p = .02) or E (p = .01) scores compared to those with a lower score for this reason. Among participants who reported fewer reasons for increasing social relationships (−1 SD), the Competitive Modality of surfing was associated with an increased PHS (p = .02) or SR (p = .03) QoL compared to the Recreational Modality. No other main effects were found, $p > .19$.

Fig. 6 (left bottom panel) illustrates the results for the PHLI domain. The main effect of Surfing Modality, as covariable, appears in the analysis of all ten Reasons for Surfing, $p < .01$. Thus, Para-Surfers reported lower scores in PHLI QoL domain compared with Surfers. The regression analysis revealed a two-way interaction between Practice Modality and the reason for surfing *Improving mental health* (B_{PHLI} = 1.97, $t(140) = 2.18$, $p = .03$, 95% CI [0.19, 3.75], $1 - \beta = 0.81$, f^2 = 0.08). Participants who reported lower scores for the reason improving their mental health had higher PHLI domain ratings in a Competition Modality than in a Recreational one ($B_{PHLI} = -2.04$, $t(140) = -2.68$, p = .008, 95% CI [−3.55, −0.53], $1 - \beta = 0.65$, $f^2 = 0.08$). The three-way interaction between Practice Modality, *Improve mental health*, and Surfing Modality was not significant, $p > .20$.

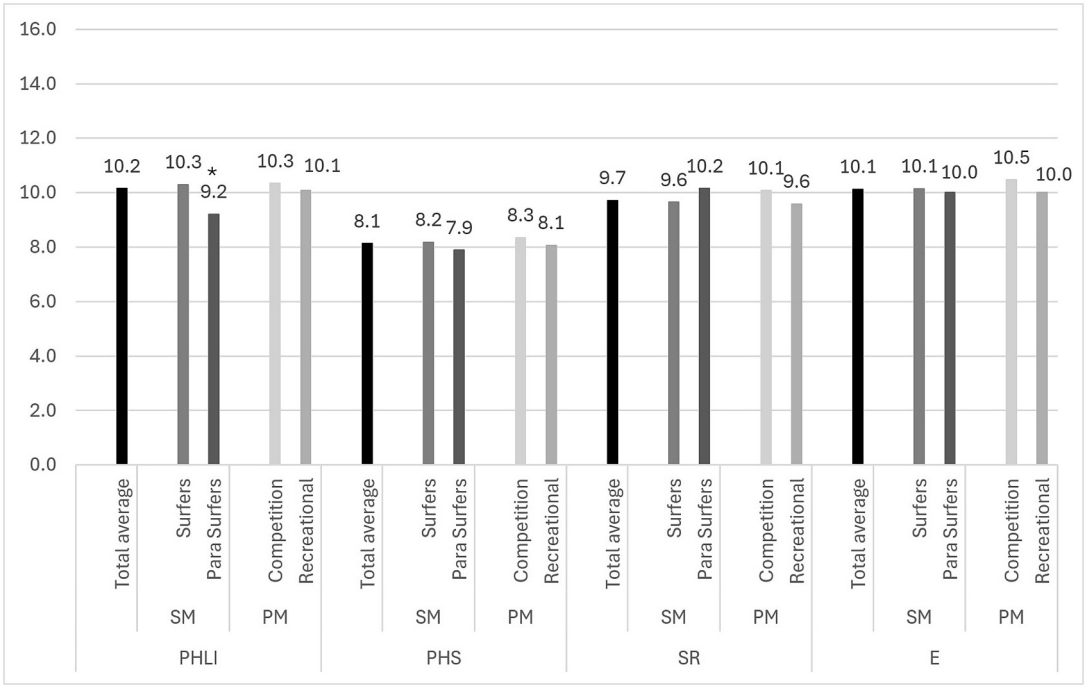


Fig. 5. Respondents' four QoL domains scores. Note: †$p < .10$; *$p < .05$; **$p < .01$; ***$p < .001$. SM: Surf modality. PM: Practice modality. PHLI: Physical Health and Level of Independence, PHS: Psychological Health and Spirituality, SR: Social Relationships, E: Environment.

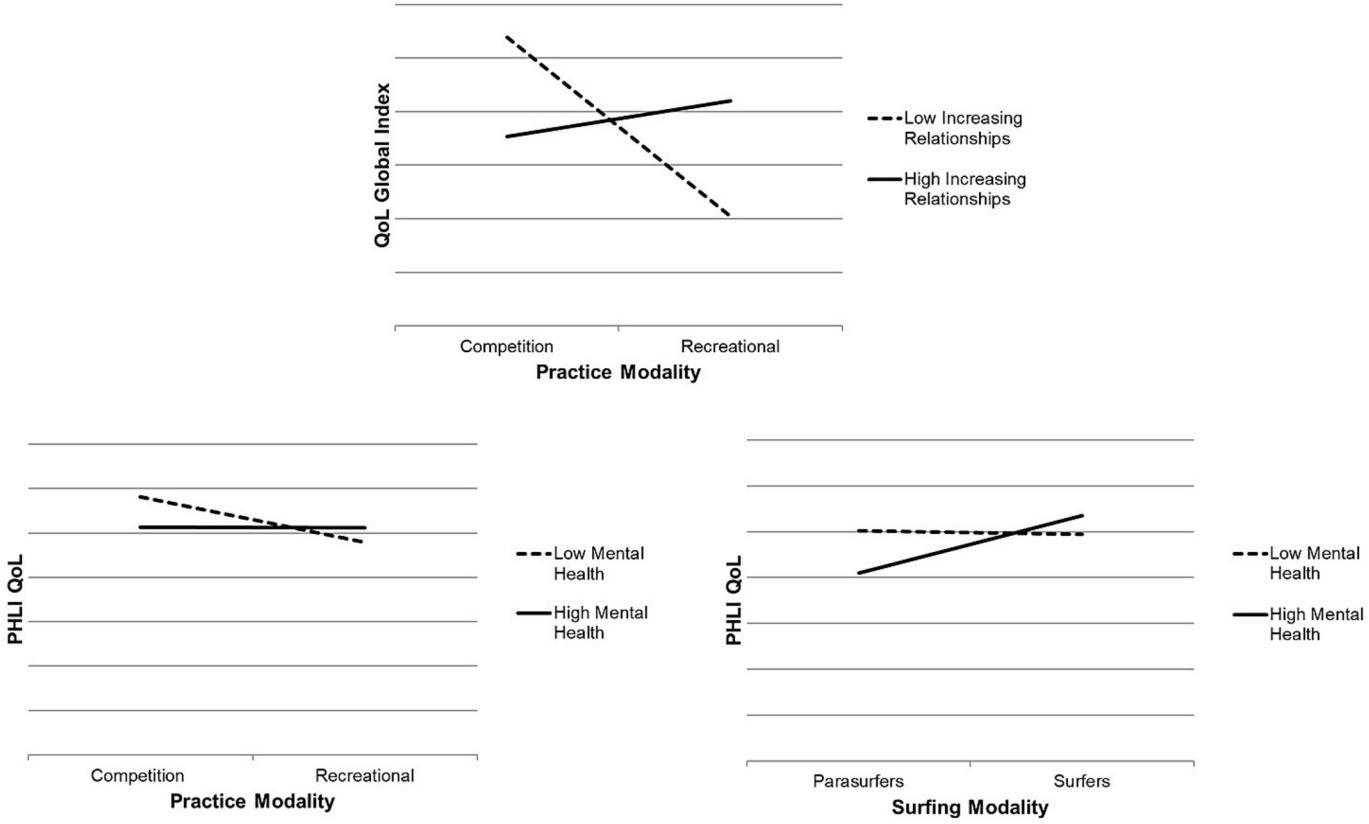


Fig. 6. Top panel: Global QoL as a function of Practice Modality and Reason for Increase social relationships. Left bottom panel: PHLI domain of QoL as a function of Practice Modality and Reason for Improve my mental health. Right bottom panel: PHLI domain of QoL as a function of Surfing Modality and Reason for Improve my mental health.

A second hierarchical regression analysis was conducted to analyze the relationship between the variables QoL (global index) and the four domains, with Surfing Modality (Surfing; Para-Surfing), each of the ten Reasons for Surfing (continuous) and their interactions as predictor variables, separately. Practice Modality (Competitive; Recreative) was included as a covariate.

The results showed no main effect of Surfing Modality in any analysis of QoL (global index) ($p > .19$). The effects of the analysis of any of the ten Reasons for Surfing on QoL were not significant ($p > .25$). Practice Modality also had no effect on any of the analyses, $p > .24$. None of the 2-way possible interactions between Surfing Modality and any of the ten reasons on the Global QoL Index were significant $p > .11$.

When examining the different domains results revealed a main effect of Surfing Modality on the PHLI domain for all ten Reasons for Surfing, $p < .01$, as commented before, Para-Surfers reported lower scores in the QoL PHLI domain compared with Surfers. Furthermore, a significant two-way interaction emerged between *Improve mental health* and Surfing Modality ($B_{PHLI} = 2.44$, $t(140) = 2.59$, $p = .01$, 95% CI [0.58, 4.30], $1 - \beta = 0.77$, $f^2 = 0.09$), Fig. 6 (right bottom panel). Para-Surfers reported higher QoL ratings in the BPHLI domain when they had lower score in the reason to improve their mental health than those who had a greater score in the reason to improve their mental health ($B_{PHLI} = -1.74$, $t(140) = -2.09$, $p = .04$, 95% CI [−3.39, −0.10], $1 - \beta = 0.90$, $f^2 = 0.09$). Among Surfers, however, there were no significant differences ($p = .11$). Additionally, the difference in PHLI between Surfers and Para-Surfers was only significant for those with higher scores on improving their mental health ($B_{PHLI} = 2.86$, $t(140) = 3.45$, $p < .001$, 95% CI [1.23, 4.52], $1 - \beta = 0.47$, $f^2 = 0.09$).

No other effects were observed across the different domains $p > .07$.

4. Discussion

The present findings indicate that participants, Surfers and Para-Surfers, engaged in competitive and recreational surfing activities with the objective of enhancing their mental and physical well-being, confronting a personal challenge, and fostering personal autonomy, similar to those found in previous studies (Santos, 2024). These findings are consistent with the previously documented perceptions of surfers who have reported a positive impact of surfing on their physical and mental well-being, as well as its role in stress management and the cultivation of social connections (Manero et al., 2024). The comparative analysis of the reasons underlying participation in surfing revealed that individuals engaged in competitive activities cited pertaining to achieving athletic success, recognition, personal challenges, travel, physical health, and economic benefits, compared to those participating recreationally. Which is consistent with previous research that found higher intrinsic and extrinsic motivations in competitive athletes than in recreationally (Polat & Doğan, 2018).

In addition, Para-Surfers exhibited a higher propensity to pursue reasons associated with attaining athletic achievements, and receiving recognition for their sporting accomplishments, in comparison to Surfers. These results are congruent with the search of the fulfillment basic psychological needs, competence, autonomy, and relatedness (Deci & Ryan, 2013; Ryan & Deci, 2000).

Previous research had been showed that athletes, with (Nemček, 2016; Vita et al., 2020; Zheng et al., 2023) and without disability (Houston et al., 2016), had high Quality of Life. This is consistent with the results of the present study suggest that there is no significant difference in overall Quality of Life scores between Surfers and Para-Surfers. However, Para-Surfers demonstrated a lower QoL in the Physical Health and Level of Independence domain compared to Surfers. Considering these two results, the lack of difference in global QoL, despite differences in the physical health and level of independence (PHLI) domain, suggests that the psychological and social benefits of para-surfing could counterbalance the lower physical component. In this study, a control group of individuals with disabilities who do not engage in surfing was not included. Although there was no control group of people with disabilities who did not surf for comparison, the systematic review conducted by (Lima-Castro et al., 2020) confirmed that the scientific literature suggests people with physical disabilities have significantly lower QoL in the Physical Health and Level of Independence domain sores compared with the other three domains of QoL. Exploration of this path is essential for future research.

The present study also did not identify any notable differences in Quality of Life between participants engaged in Competitive and Recreational Surfing. The findings revealed that there was no statistically significant main effect of Practice Modality (Competitive or Recreational Surfing) on any of the global QoL analyses. Notwithstanding the assertion that competitive sports can impair QoL, in a study comprising 227 competitive surfers, demonstrated that the physical and mental components of QoL were found to be significantly higher than the population norm (Burgess et al., 2019). A similar pattern of findings has been documented in the context of disability athletes. For instance, an observation was made that competitive swimmers with physical or cognitive impairments exhibited elevated psychological and emotional well-being scores in comparison to the control group, which did not engage in competitive sports (Puce et al., 2019). In order to elucidate this context, some authors demonstrated that life aspirations had a mediating effect between quality of psychological well-being and sports practice (Chatzisarantis & Hagger, 2007). These findings lend support to the notion that life aspirations, rather than sport participation per se, constitute the pivotal factor determining the level and quality of psychological well-being. Another study demonstrated that intrinsic motivation has a beneficial impact on the psychological well-being of athletes (Núñez et al., 2011).

In this sense, it is a fallacy to assume that all individuals partake in sporting activities for identical reasons (Constantinescu, 2011). It is therefore essential that a meaningful analysis begins with the identification of the underlying motivation for each individual's participation in sport. This author put forth a proposal for an investigation into the extent to which the activity in question has met these expectations and the subsequent improvement in QoL. In light of the aforementioned interest in the relationship between the reasons for engaging in sporting activities and QoL, the present investigation has identified a two-way interaction between the practice modality and the reason of increasing social relationships as a factor influencing QoL. This interaction was such that those who surfed in a recreational mode with a higher score for "increasing social relationships as a reason for surfing" exhibited higher QoL scores compared to those who reported that "increasing social relationships was not a strong reason for surfing." Additionally, among individuals who indicated fewer reasons for improving their social relationships, those participating in competitive surfing demonstrated a higher quality of life relative to their counterparts involved in recreational surfing The results demonstrated a consistent pattern across the domains of Psychological Health and Spirituality, Social Relationships, and Environment for QoL. In essence, the factors that contribute to an individual's QoL are not contingent on the competitive or leisure aspects of surfing, nor on the underlying reasons for engaging in this activity. It would appear that the QoL for surfers is most enhanced when their reasons for surfing are coherent with the modality of surfing they engage in. Likewise, in a study, with 554 older adults who engage in PA, the QoL was analyzed (Ibáñez-Pérez et al., 2023). The findings revealed a notable discrepancy between the QoL of individuals who engage in PA for reasons pertaining to their interest in sports and/or for health benefits, and those who do so for leisure and social reasons. The researchers observed that when the motivation for PA was derived from the desire to make friends and have fun, it was associated with a higher level of the "social relationships dimension" of QoL compared to those who engaged in PA for reasons related to liking sports or health. In contrast, when the motivation for PA was driven by health concerns, the "psychological health dimension" of QoL exhibited a higher level compared to those who engaged in PA for reasons related to sport or enjoyment.

In this context, individuals' past experiences of well-being are influenced by the characteristics of their personal goals and the reasons behind pursuing them (Ryan & Deci, 2000).

This could explain the differences in the QoL between athletes in the present study. To address this question, would be beneficial to conduct a new study that analyses the different motivations in competitive and recreational surfers within the framework of Self-determination Theory (Deci & Ryan, 2013; Hagger & Chatzisarantis, 2008).

Another result showed that QoL scores, in relation to physical health and independence, were higher in the competitive mode than in the recreational mode when the motivation for surfing was not to improve their mental health. Also, the Para-Surfers cohort demonstrated enhanced ratings of QoL within PHLI domain when they exhibited a reduced inclination to pursue enhancements to their mental health through surfing, in comparison to those who evinced a stronger propensity to cultivate improvements in their mental well-being. A subsequent investigation is necessary to identify the underlying mechanism of this result.

In regard to the relationship between the utilization of adapted equipment by Para-Surfers with motor disabilities and QoL, a significant correlation was identified between the global QoL index and the Psychological health, Spirituality and Environmental QoL domain with the extent to which the equipment used for the sport was adapted to meet the individual needs of the participants. The participation at higher levels of adapted sport competition has been found to entail certain compromises in the social environment, particularly for families, which can have a detrimental impact on the QoL of athletes with disabilities (Côté-Leclerc et al., 2017). In particular, the restricted participation rate may contribute to a reduction in QoL, as reported difficulties with organizational accessibility (limited number of teams, schedule) and training facilities may lead to a lack of satisfaction with the sporting environment. To this purpose, it is vital that Para-Surfers have access to adapted equipment that enables them to engage in surfing in a secure, controlled and enjoyable environment, which then positively affects their QoL.

This study has some limitations that must be acknowledged. First, although we attempted to reach as many surfers as possible, we were not entirely successful; therefore, the sample may not be representative of all Spanish Surfers and Para-Surfers. Because the study was conducted online, individuals without internet access were unable to participate, potentially introducing bias. Additionally, the small sample size may have reduced the statistical power of the analyses. The low statistical power observed in some tests suggests caution when interpreting null results. Second, the questions regarding reasons for participation in surfing were not derived from a validated questionnaire, which could introduce information bias. Third, although we used a validated scale to assess quality of life, the Cronbach's α coefficients for each dimension were below 0.70 and lower than those reported in the original scale, indicating potential reliability issues. This low reliability may weaken confidence in the reported interaction effects on the SR and E domains. Finally, this study did not include a control group of individuals with and without disabilities who do not surf, limiting the scope of comparative analyses. Given that this is an exploratory analysis, future research should focus on studies designed to establish causal relationships and identify the underlying mechanisms behind the results. Subsequent research should employ larger sample sizes and include control groups (e.g., individuals who do not surf or participate in sports). Future studies should also consider analyzing potential gender differences in the quality of life among surfers. Additionally, future research would benefit from examining the different motivations of competitive and recreational surfers within the framework of self-determination theory. Furthermore, it is important that future studies utilize standardized scales of motivation and quality of life with improved psychometric properties.

5. Conclusion

Considering the results of this exploratory study and previous research, it seems that it is possible to facilitate positive affect through the practice of PA, thus contributing to the maintenance or improvement of an individual's health and, consequently, to the strengthening or promotion of his or her QoL. To ensure the supply of appropriate sporting activities, it is essential to address both leisure and competitive activities among the general population and people with disabilities. In this sense, according to the results of this research, it is necessary to orient the sport practice of surfers, whether for leisure or competition, in line with the goals of the athlete himself so that this practice has a positive effect on the QoL. Future research must focus on different motivations in competitive and recreational surfers within the framework of Self-determination Theory and its relations with QoL.

CRediT authorship contribution statement

Mar González-Noriega: Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Resources, Project administration, Methodology, Investigation, Formal analysis, Conceptualization. **Ana Cancela:** Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Resources, Project administration, Methodology, Investigation, Formal analysis, Conceptualization. **Alejo García-Naveira:** Writing – review & editing. **Roberto Ruíz-Barquín:** Writing – review & editing.

Declaration of Generative AI and AI-assisted technologies in the writing process

During the preparation of this work, the authors used Wordvice.AI and DeepL Write to enhance readability and language, aiding in formulating and structuring content. After using this tool, the authors reviewed and edited the content as needed and take full responsibility for the content of the publication.

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The authors declare the following financial interests/personal relationships which may be considered as potential competing interests:

I have nothing to declare If there are other authors, they declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Data availability

All files will be archived in a secure location for at least 10 years following publication of the article. The corresponding author would allow access to the anonymized raw data and related coding information underlying all findings reported in the paper to other competent professionals who request them, provided that (a) the confidentiality and informed consent of participants are not compromised, (b) legal rights

concerning proprietary data do not preclude their release, and (c) professionals requesting data agree in writing in advance that shared data will be used exclusively for the purpose of verifying the substantive claims through reanalysis or for some other agreed-upon use.

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