

Influence of gender and age on behavioral regulation in practitioners of group exercise activities

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ABSTRACT

Motivation plays a crucial psychological role in the participation and consistency of exercise and physical activities. Therefore, examining it in various types of directed activities (GEAs) can provide valuable resources for sports centres, enhancing the experience of their participants. The objective of the study was to analyse behavioural regulation in DA practitioners, exploring the relationships between their motivational variables and identifying differences in regulation based on gender, age, and type of GEA. A sample of 291 DA practitioners (64 men and 227 women) aged between 17 and 82 years (mean age: 42.79 ± 16.02 years) was used. The variables analysed were different types of behavioural regulation (using the BREQ-2 questionnaire). The results showed significant differences in behavioural regulation according to gender, age, and type of GEA. Men exhibited a greater tendency toward less self-determined regulation, those practicing body-mind GEAs (BM) showed higher levels of demotivation (DM), and younger participants demonstrated lower external regulation (ER). Further research is needed to confirm these findings.

Keywords: Motivation, Self-determination, Exercise, BREQ-2.

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INTRODUCTION

Group exercise activities (GEA) refer to structured forms of physical exercise conducted in a group setting under the guidance of an instructor who teaches, guides, and motivates participants (González-Cutre & Sicilia, 2012; Pérez-Villalba et al., 2017; Thompson, 2017). This exercise style represents a current trend in physical activity promotion (Box et al., 2019) and is frequently regarded as an effective intervention strategy to increase physical activity levels (Deforche & De Bourdeaudhuij, 2000; Nyström et al., 2016).

Different classifications of GEA exist due to the variety of training formats, which differ in aspects such as intensity, type, equipment used, and location (Mata, 2011). As highlighted by Hultquist (2012) and mentioned in Ginés-Díaz et al. (2021), GEA can be categorized into cardiorespiratory activities (CR) (e.g., aerobics or spinning), strength activities (SA) (those utilizing various resistances such as weights, bands, or body weight to build strength), mind-body activities (MB) (e.g., Pilates, stretching, or CORE classes), and specialized activities (SP) (such as salsa, belly dancing, hip-hop, etc.).

Motivation is defined as the result of various personal, social, and environmental factors that influence the choice of physical activity, the frequency and intensity of its practice, its persistence, and ultimately, performance (Escartí & Cervelló, 1994). Several theories have been developed to explain motivation as a key factor of human behaviour. However, all motivational differences related to physical exercise practice fall within the framework of self-determination theory (SDT) (Deci & Ryan, 1985, 1991, 2000), which has been extensively supported by research (Balaguer et al., 2008; Moreno, Cano et al., 2009; Ryan & Deci, 2000) and often combined with achievement goal theory (Nicholls, 1989).

Self-determination theory (Deci & Ryan, 1985, 1991, 2000) is a macro-theory of motivation that describes and explains how individuals can be intrinsically or extrinsically motivated to engage in activities. The theory structures motivation along a continuum, ranging from non-self-determined to self-determined behaviours, identifying three primary types of motivation: amotivation, extrinsic motivation, and intrinsic motivation. When basic psychological needs (autonomy, competence, and relatedness) are satisfied, individuals are more likely to feel intrinsically motivated to engage in an activity. This results in participation for the satisfaction it provides and greater freedom in decision-making. Conversely, if these needs are unmet, motivation becomes more extrinsic, driving individuals to participate for external reasons, which can lead to frustration or lack of interest (amotivation) (Moreno, Hernández & González-Cutre, 2009). Each form of motivation is associated with regulatory processes, which may include values, rewards, self-control, interests, enjoyment, satisfaction, and more (Moreno & Martínez, 2006).

Within the SDT framework, the organismic integration theory (OIT) (Ryan et al., 1985) provides further insight into how individuals internalize and integrate external regulations into their behaviour. This theory explores how the social environment can influence the adoption or rejection of cultural and social regulations. According to Ryan and Deci (2000), extrinsic motivation can take on various forms, depending on the degree of internalization and integration into behavioural regulation. Individuals may engage in activities due to external pressures (external regulation), feelings of guilt (introjected regulation), recognition of the activity's value without deriving pleasure from it (identified regulation), or because the activity aligns with their values and identity (integrated regulation). This continuum of behavioural regulation includes six stages: amotivation (AM), external regulation (ER), introjected regulation (IJR), identified regulation (IDR), integrated regulation (IGR), and intrinsic regulation (IR). These stages range from the least self-determined to the most self-determined behaviours.

Given that motivation is considered the most significant psychological factor influencing human behaviour (Iso-Ahola & Clair, 2000), its relationship with adherence to physical exercise is evident. As Schutzer and Graves (2004) assert, understanding adherence to exercise requires comprehending the specific cognitive processes associated with motivation. Therefore, the present study aims to enhance sports participation by examining the motivational factors influencing behavioural regulation in physical exercise and identifying preferences in this context based on factors such as the type of GEA, gender, and age of the participant. In line with the study's objectives, it is hypothesized that the highest intrinsic motivation scores will be observed among practitioners of CR-type GEA (Amate, 2020), older individuals (Muyor et al., 2009), and men (Castañeda et al., 2018), with men also scoring higher in IJR (Durán-Vinagre, 2022).

MATERIAL AND METHODS

Participants

The study sample initially included 303 participants; however, 12 were excluded as the physical activities they practiced could not be classified as a type of GEA, as they involved competitive sports (e.g., soccer, paddle tennis, running, etc.). As a result, the study was carried out with a final sample of 291 participants, aged between 17 and 82 years. Among these, 21.99% (N = 64) were men, while 78.01% (N = 227) were women. The mean age of the participants was 42.79 ± 16.02 years. Based on Erikson's (1968, 1993) classification of life stages, 5.50% (N = 16) were categorized as being in adolescence, 39.18% (N = 114) in early adulthood (EA), 41.92% (N = 122) in middle adulthood (MA), and 13.40% (N = 39) in late adulthood (LA).

In terms of the type of GEA practiced, 9.62% (N = 28) participated in cardiorespiratory activities (CR), 26.12% (N = 76) in mind-body activities (MB), 29.55% (N = 86) in strength activities (SA), 3.44% (N = 10) in specialized activities (SP), and 31.27% (N = 91) engaged in a combination of two or more of the aforementioned types, classified as multi-activity (MA).

Measures

BREQ-2

The Behavioural Regulation in Exercise Questionnaire-2 (BREQ-2) is one of the most widely used scales to measure behavioural regulation in exercise psychology research (Wilson, 2012). The original questionnaire (BREQ) was developed by Mullan et al. (1997) to measure IR, IDR, IJR, and ER. The second version of this questionnaire was created by Markland and Tobin (2004) and added a fifth factor to measure AM. The scale measures behavioural regulation in exercise based on 19 items, grouped into five factors: IR (e.g., "Because I enjoy exercise sessions"), IDR (e.g., "Because it is important to me to exercise regularly"), IJR (e.g., "Because I feel bad about myself if I don't exercise"), ER (e.g., "Because others tell me I should"), and AM (e.g., "I don't see the point in exercising"). Respondents answer the statement "I exercise..." through the items included in the scale. This study used the BREQ-2 version, which has shown significant factorial validity as well as validity in different contexts, validated for the Spanish context by Moreno, Cervelló, and Martínez (2007). The responses are closed-ended and follow a Likert scale from 1 to 5, where 1 means not true for me at all and 5 means completely true for me. Of the 19 items included in this scale, the Spanish validation by Moreno et al. (2007) discarded item 17 ("Because I get nervous if I don't exercise regularly") as it did not surpass the required saturation of 0.40. The internal consistency coefficients obtained during the Spanish validation of this questionnaire were as follows: IR, $\alpha = 0.89$; IDR, $\alpha = 0.81$; IJR, $\alpha = 0.82$; ER, $\alpha = 0.86$; AM, $\alpha = 0.89$. Therefore, these scales demonstrate adequate reliability ($\alpha > 0.70$) (Nunnally & Bernstein, 1994). Furthermore, the BREQ-2 has been used by Wang (2004) and Wilson and Rodgers (2004), both of whom

obtained adequate psychometric measures, demonstrating high factorial validity (Havnen et al., 2023) and reliability when applied in the Spanish context (Carcelén et al., 2023; Fuentes-García et al., 2021).

Procedures

This study employed a descriptive, cross-sectional design. Data collection was conducted through surveys using an online form. The digital survey was distributed via social media platforms and in various sports centres in Valencia, Spain, using an informational poster that provided access to the questionnaire. Participants were repeatedly informed that the form was voluntary and anonymous, in compliance with Royal Decree 3/2018, of December 5, on the Protection of Personal Data and the Guarantee of Digital Rights. The study adhered to the ethical principles outlined in the Declaration of Helsinki. Participants could clarify any doubts that arose at any time while completing the questionnaire. The average time required to complete the form was approximately 10 minutes. The survey began with a detailed explanation of the study, followed by a series of sociodemographic and contextual questions, and concluded with the single-selection questionnaire corresponding to the BREQ-2 measurement instrument. Participants were given two weeks from the date of distribution to complete the questionnaire.

Once the response period had ended, all collected responses were exported to Excel. The data regarding the type of GEA practiced by each participant were reorganized and grouped according to the classification proposed by Hultquist (2012), as referenced in Ginés-Díaz et al. (2021), with the addition of the multi-activity (MA) GEA category for participants who reported practicing more than two different types of GEA based on the employed classification. Following this reorganization, the grouping of surveyed GEAs was as follows:

Table 1. Grouping of surveyed GEAs based on the classification by Hultquist (2012).

Cardiorespiratory	Aerobics, spinning, Zumba, fit boxing, HIIT.
Strength	Personal training, CrossFit, Boompa, circuit training, body pump. GAP, functional training, weight training.
Mind-body	Pilates, yoga, CORE, body balance, maintenance gymnastics.
Specialized	Tai chi, hip-hop, dance.
Multi-activity	(Combination of at least two GEAs from different categories).

Note. GEA: Group Exercise Activities.

Additionally, participants were grouped into different stages based on their age. The age ranges for each period were defined using the classification of human developmental stages from Erikson's Psychosocial Development Theory (1968, 1993), with slight adjustments to the distribution due to the low number of participants in adolescence ($N = 16$) and their proximity to early adulthood (ages ranging from 17 to 20). Thus, individuals aged 17 to 40 were classified as early adulthood (EA), middle adulthood (MA) was defined as ages 41 to 60, and late adulthood (LA) included participants aged 61 and older.

Analysis

Inferential analysis of behavioural regulation variables was conducted based on the type of GEA, gender, and age using the Kruskal-Wallis test to examine differences between groups. Statistical significance was established at values less than .05. To identify which groups showed significant differences in motivational variables when comparing GEA types and age stages, both the types of GEA and age stages were compared using the Mann-Whitney U test with Bonferroni correction. Subsequently, Spearman correlation analysis was performed to explore the relationships among all dependent variables. Statistical significance was established at values less than .05.

Next, a reliability analysis was conducted to assess the internal consistency of the questionnaires used in the study. Cronbach's alpha was applied, with values equal to or greater than .70 indicating good consistency (Nunnally, 1978). Additionally, McDonald's omega coefficient was calculated to measure the internal consistency of the studied variables, as it is considered by many authors to provide greater accuracy. McDonald's omega ranges from 0 to 1, with values closer to 1 reflecting higher reliability in measurements (Revelle & Zinbarg, 2009). For the coefficient to be deemed adequate, it must exceed .70, which is interpreted as an acceptable level of confidence in the results (Campo-Arias & Oviedo, 2008).

RESULTS

Table 2 presents the descriptive values and internal consistency analysis of the five subscales of the BREQ-2. The results show that all five subscales demonstrate adequate internal consistency, with Cronbach's alpha and McDonald's omega values exceeding 0.70 for all variables. The IR subscale exhibits particularly high consistency, with alpha and omega values exceeding 0.90. The ER and IJR subscales also display high reliability, with coefficients above 0.80.

Table 2. Descriptive statistics and reliability analysis of the BREQ-2 subscales.

Variables	N	Minimum	Maximum	M	SD	α	ω
Intrinsic regulation	291	1.00	5.00	4.01	1.13	0.93	0.93
Identified regulation	291	1.00	5.00	3.78	1.45	0.75	0.81
Introjected regulation	291	1.00	5.00	2.26	1.29	0.83	0.83
External regulation	291	1.40	5.00	1.24	0.71	0.86	0.86
Amotivation	291	1.00	5.00	1.25	0.77	0.74	0.78

Note. M: Mean. SD: Standard deviation. α : Cronbach's alpha. ω : McDonald's omega.

Table 3 presents behavioural regulation variables according to the type of GEA practiced. Regardless of the activity, participants reported consistently high levels of IR and IDR, while reporting very low levels of ER and AM. Regarding group differences, significant differences were observed for AM based on the type of activity practiced ($H = 14.8$; $p < .01$; $\eta^2 = .04$). Specifically, pairwise comparisons revealed that participants practicing MB-type GEA reported higher AM ($Md = 1$; $IQR = 1.00-1.56$) than those practicing MA-type GEA ($Md = 1$; $IQR = 1.00-1.56$; $p < .05$), despite both groups having the same median. On the other hand, although differences were not significant, a trend was observed for IDR ($H = 7.94$; $p = .09$; $\eta^2 = .01$), indicating lower IDR among participants practicing SP-type GEA ($Md = 3.38$) compared to those practicing MA-type GEA ($Md = 4.00$; $p = .21$) and FZ-type GEA ($Md = 4.00$; $p = .29$).

Table 3. Behavioural regulation analysis by type of GEA.

Variable	Cardiorespiratory Md (IQR)	Mind-body Md (IQR)	Strength Md (IQR)	Specialized Md (IQR)	Multi-activity Md (IQR)	H	p	η^2
Intrinsic regulation	4.50 (3.44 – 5.00)	4.00 (3.25 – 4.75)	4.25 (3.06 – 5.00)	3.25 (2.81 – 4.88)	4.50 (3.75 – 5.00)	5.41	.20	.01
Identified regulation	4.00 (3.25 – 4.25)	4.00 (3.25 – 4.25)	4.00 (3.50 – 4.25)	3.38 (2.50 – 3.88)	4.00 (3.50 – 4.50)	7.94	.09	.01
Introjected regulation	2.33 (1.67 – 3.00)	2.33 (1.33 – 3.33)	2.00 (1.33 – 2.67)	1.50 (1.00 – 2.00)	2.00 (1.33 – 3.00)	6.67	.20	.01
External regulation	1.00 (1.00 – 1.25)	1.00 (1.00 – 1.25)	1.00 (1.00 – 1.00)	1.00 (1.00 – 1.50)	1.00 (1.00 – 1.13)	5.26	.30	.00
Amotivation	1.00 (1.00 – 1.56)	1.00 (1.00 – 1.56)	1.00 (1.00 – 1.00)	1.13 (1.00 – 1.44)	1.00 (1.00 – 1.00)	14.8	< .01	.04

Note. Md: Median; IQR: Interquartile Range.

In Table 4, behavioural regulation variables by gender are shown. Women tended to score slightly higher in more self-determined regulations such as IR (Md = 4.25) and IDR (Md = 4.00) compared to men (IR: Md = 4.00; IDR: Md = 3.75). However, neither IR ($p = .20$) nor IDR ($p = .80$) scores were statistically significant. Conversely, less self-determined regulation variables showed more significant results. Specifically, men scored slightly higher in ER (Md = 1; IQR = 1.00–1.50) and AM (Md = 1; IQR = 1.00–1.50) compared to women (ER: Md = 1; IQR = 1.00–1.00; AM: Md = 1; IQR = 1.00–1.00; $p < .05$). This suggests that, despite the small effect size ($\eta^2 = .01$), men tend to identify more with external regulation and amotivation statements (Table 4).

Table 4. Behavioural regulation analysis by gender.

Variable	Female Md (IQR)	Male Md (IQR)	H	p	η^2
Intrinsic regulation	4.25 (3.50 – 5.00)	4.00 (3.25 – 4.75)	1.60	.20	.00
Identified regulation	4.00 (3.31 – 4.25)	3.75 (3.50 – 4.25)	0.06	.80	.00
Introjected regulation	2.00 (1.33 – 3.00)	2.33 (1.67 – 3.00)	1.01	.30	.00
External regulation	1.00 (1.00 – 1.00)	1.00 (1.00 – 1.50)	4.36	<.05	.01
Amotivation	1.00 (1.00 – 1.00)	1.00 (1.00 – 1.50)	5.15	<.05	.01

Note. Md: Median; IQR: Interquartile Range.

In Table 5, behavioural regulation variables are shown based on age stage. The data indicate that scores decrease as the type of regulation becomes less self-determined. Additionally, significant differences were observed for ER ($H = 7.15$; $p = .03$; $\eta^2 = .02$). However, while pairwise comparisons did not reveal significant differences for ER, there is a clear trend of lower scores in early adulthood (EA) for this regulation type (Md = 1.00; IQR = 1.00–1.00) compared to middle adulthood (MA) (Md = 1.00; IQR = 1.00–1.25; $p = .06$) and late adulthood (LA) (Md = 1.00; IQR = 1.00–1.50; $p = .09$), despite similar medians across all three age stages.

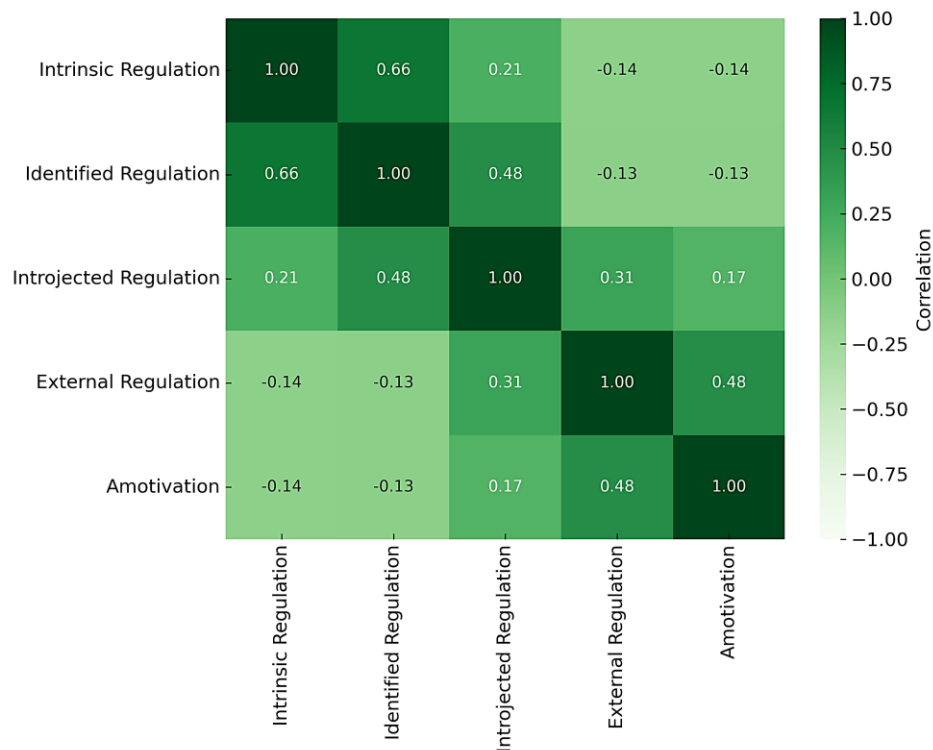


Figure 1. Correlations between behavioural regulation variables.

Table 5. Behavioural regulation analysis by age stage.

Variable	Early adulthood Md (IQR)	Middle adulthood Md (IQR)	Late adulthood Md (IQR)	H	p	η^2
Intrinsic regulation	4.50 (3.50 – 5.00)	4.25 (3.25 – 5.00)	4.12 (3.25 – 5.00)	0.74	.70	.00
Identified regulation	4.00 (3.25 – 4.25)	4.00 (3.50 – 4.25)	4.00 (3.44 – 4.50)	0.56	.80	– .01
Introjected regulation	2.00 (1.33 – 2.75)	2.00 (1.33 – 3.00)	2.17 (1.00 – 3.00)	0.89	.60	.00
External regulation	1.00 (1.00 – 1.00)	1.00 (1.00 – 1.25)	1.00 (1.00 – 1.50)	7.15	<.05	.02
Amotivation	1.00 (1.00 – 1.00)	1.00 (1.00 – 1.38)	1.00 (1.00 – 1.25)	2.16	.30	.00

Note. Md: Median; IQR: Interquartile Range.

Figure 1 illustrates the relationships between all variables. The strongest positive correlation is observed between IR and IDR ($r = 0.66$). Additionally, weaker correlations are noted between IDR and IJR ($r = 0.48$), as well as between ER and AM ($r = 0.48$).

DISCUSSION

The results obtained in this study reveal certain significant aspects that require analysis and comparison with similar research to validate or refute the proposed hypotheses.

Before discussing the findings based on the established objectives, it is important to highlight one of the most notable sociodemographic aspects of the data collected in this study: the clear predominance of female participants (78.01% women compared to 21.99% men). This finding aligns with other studies that observe a greater prevalence of women participating in GEAs compared to men. Specifically, Tuero and González-Boto (2018) observed a similar trend in the context of aquatic activities, where women showed a greater preference for participating in aquatic GEAs (69.5% of respondents) compared to men (51.4% of respondents). In this regard, it is essential to highlight the influence of the type of activity, as the results of a study that also employed the BREQ-2 in the Spanish context indicated that women revealed more positive motivation than men in aquatic activities, whereas no gender differences were found in terrestrial activities (Moreno et al., 2009). Similarly, a study that used the BREQ-2 to examine the influence of gender and physical activity on motivation among Spanish children aged 12 to 15 years (Varela, 2010) found that boys were more active than girls, which translated into higher motivation for physical activity—potentially influenced by age.

As expected, participants scored higher on the more self-determined behavioural regulation variables (IR and IDR) and lower on the less self-determined variables (ER and AM). These results are similar to those presented by Durán-Vinagre (2022) and align with the current literature, which indicates that more self-determined forms of regulation lead to greater engagement in physical activity, with intrinsic motivation being the most predictive of long-term adherence (Teixeira et al., 2012). This relationship is further evidenced in the correlation analysis, which found strong relationships between the more self-determined variables, such as IR and IDR ($r_s = 0.66$), and weaker relationships between the less self-determined variables, such as ER and AM ($r_s = 0.48$).

Regarding differences in behavioural regulation based on the type of GEA practiced, significant differences were observed only in AM. Specifically, participants practicing MB-type GEAs reported higher AM than those practicing MA-type GEAs. This may suggest that individuals who engage in various types of GEAs simultaneously have more self-determined behaviour, possibly due to their enjoyment of physical exercise itself, regardless of the type of GEA. Additionally, Amate (2020) observed in their study that CR-type activities scored higher in intrinsic motivation, consistent with the hypotheses and the present analysis, where CR and

MA-type GEAs achieved the highest scores in this level of behavioural regulation. However, these differences were not statistically significant ($p > .05$).

In terms of gender-based differences in behavioural regulation, Özdilek et al. (2016) indicate that motivation for sports differs according to this sociodemographic variable. In line with this, our study observed differences in IR ($p = .20$) and IDR ($p = .80$) that were not statistically significant. These differences highlight slightly higher scores among women in these more self-determined stages of behavioural regulation. The significant differences ($p < .05$) indicate higher RIQ scores for men in the less self-determined stages of behavioural regulation (ER and AM). This suggests more self-determined behaviour among women and less self-determined behaviour among men. These findings align with those of various authors (Fuhrmann, 2018; Jakobsen & Evjen, 2018), who state that women exhibit higher intrinsic motivation for physical exercise, while extrinsic factors are more prevalent among men. However, these results contradict both the hypothesis and findings from other studies, which highlight that men display higher intrinsic motivation than women (Durán-Vinagre, 2022; Castañeda et al., 2018; Concha et al., 2017). Conversely, Muyor et al. (2009) found no significant differences in behavioural regulation related to gender. Additionally, although not statistically significant ($p = .30$), men scored slightly higher in IJR than women. This finding is consistent with the hypothesis and Durán-Vinagre's (2022) results, which were statistically significant in this aspect.

In relation to age-based differences in behavioural regulation, the results show significant differences only in ER, which was more prevalent among middle-aged and older adults. This finding is associated with more self-determined behaviour among younger participants. These results contradict the hypothesis based on findings by Muyor et al. (2009), which indicated higher values for more self-determined regulations among older age groups. However, Brunet and Sabiston (2011) found that middle-aged adults (in their study, aged 45 to 64 years) exhibited lower intrinsic motivation compared to younger adults, indirectly aligning with the results obtained here.

One of the main limitations of this analysis lies in the need, as stated by Sansone and Harackiewicz (2000), to examine motivational patterns among individuals in similar environmental contexts. Therefore, future studies could explore how various variables affect motivational factors in similar settings, such as gyms, specialized centres, or personal classes. Additionally, since this study considered different age groups ($M = 42.79 \pm 16.02$), it encompassed a wide range, implying that the results may not be entirely significant when compared with more homogeneous populations, such as students (Fuhrmann, 2018; Jakobsen & Evjen, 2018; Durán-Vinagre, 2022; Fernández-Ozcotta et al., 2015). A potential focus for future research could involve analysing disparities in motivational factors for different types of GEAs within the same age group—for example, among older adults. This group is particularly relevant, as Deforche and De Bourdeaudhuij (2000) suggest that organized and structured physical activities offer greater opportunities for older individuals to remain physically active. Due to the cross-sectional design of this study, it is not possible to establish causal relationships between the analysed variables. Future research could address this limitation by observing how different types of GEAs influence motivational factors before and after their implementation.

CONCLUSIONS

Men showed a slightly higher predisposition toward less self-determined regulation. In this line, individuals practicing MB-type GEAs reported slightly higher AM compared to the rest. Similarly, younger participants exhibited lower ER compared to middle-aged and older adults.

Further research in this field is required. Considering the limitations identified in this analysis, future studies should focus on examining similar environments and contexts (such as gyms or sports centres), utilizing more homogeneous population samples in terms of age (e.g., students or older adults), and striving to determine causal relationships through the implementation of longitudinal studies.

AUTHOR CONTRIBUTIONS

Fernando Picó contributed to data collection, data analysis, and the writing and revision of the manuscript. Rafael Martínez-Gallego contributed to the study design, data analysis, and the writing and revision of the manuscript. Juan Pedro Fuentes contributed to data analysis and the writing and revision of the manuscript.

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No potential conflict of interest was reported by the authors.

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