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**Original**

## **LOS EFECTOS DEL VOLUMEN DE ENTRENAMIENTO DE NATACIÓN SOBRE LA INTELIGENCIA EMOCIONAL Y LA CALIDAD DE VIDA EN PERSONAS CON DISCAPACIDAD FÍSICA.**

## **THE EFFECTS OF SWIMMING TRAINING VOLUME ON EMOTIONAL INTELLIGENCE AND QUALITY OF LIFE IN INDIVIDUALS WITH PHYSICAL DISABILITIES.**

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## LOS EFECTOS DEL VOLUMEN DE ENTRENAMIENTO DE NATACIÓN SOBRE LA INTELIGENCIA EMOCIONAL Y LA CALIDAD DE VIDA EN PERSONAS CON DISCAPACIDAD FÍSICA.

### RESUMEN

El objetivo principal de este estudio fue evaluar el efecto de aumentar el número de sesiones de entrenamiento de natación sobre la inteligencia emocional y la calidad de vida; un objetivo secundario fue investigar el efecto de escuchar música durante el ejercicio sobre la calidad de vida y la inteligencia emocional, en ambos casos, de personas con discapacidad física. Es un estudio experimental. Se reclutaron 180 sujetos y se dividieron aleatoriamente en tres grupos iguales de 1 sesión por semana (1SPW o grupo de control), tres sesiones por semana (3SPW) y tres sesiones por semana+música (3SPW+música). Las variables fueron calidad de vida e inteligencia emocional evaluadas mediante el WHOQOL-Bref y el Schutte Self-Report Emotional Intelligence Test (SSEIT), respectivamente. Para comparar la efectividad de las intervenciones se utilizó la prueba ANCOVA seguida de la prueba de Bonferroni. Cuando se compararon los tres grupos al final de 12 semanas, se encontró una diferencia estadísticamente significativa entre el grupo de control y dos grupos experimentales en calidad de vida e inteligencia emocional. Sin embargo, no se encontraron diferencias significativas entre 3SPW y 3SPW+música en la calidad de vida (excepto en los ítems psicológicos) o la inteligencia emocional. Este estudio concluyó que aumentar el número de sesiones de entrenamiento (Para Natación) podría mejorar la calidad de vida y la inteligencia emocional en personas con discapacidad física. Al mismo tiempo, la música no logró mejorar las variables en comparación con los resultados obtenidos al aumentar el número de sesiones.

**Palabras clave:** Discapacidad física, Adultos, Ejercicio acuático, Intervenciones.

## THE EFFECTS OF SWIMMING TRAINING VOLUME ON EMOTIONAL INTELLIGENCE AND QUALITY OF LIFE IN INDIVIDUALS WITH PHYSICAL DISABILITIES.

### ABSTRACT

The primary aim of this study was to evaluate the effect of increasing the number of swimming training sessions on emotional intelligence and quality of life; a secondary aim was to investigate the effect of listening to music during exercise on the quality of life and emotional intelligence, in both cases for individuals with physical disabilities. It was an experimental study. 180 subjects were recruited and randomly divided into three equal groups of 1 session per week (1SPW or control group), three sessions per week (3SPW), and three sessions per week+music (3SPW+music). Variables were quality of life and emotional intelligence assessed by the WHOQOL-Bref and Schutte Self-Report Emotional Intelligence Test (SSEIT), respectively. Bonferroni test followed by the Bonferroni test, were used to compare the effectiveness of the interventions. When the three groups were compared at the end of 12 weeks, a statistically significant difference was found between the control group and two experimental groups in quality of life and emotional intelligence. However, no significant difference was found between 3SPW and 3SPW+music in quality of life (except in psychological items) or emotional intelligence. This study concluded that increasing the number of training sessions (Para Swimming) could improve the quality of life and emotional intelligence in people with physical disabilities. At the same time, music failed to improve the variables when compared to the results achieved by increasing the number of sessions.

**Keywords:** Physical disabilities, Adults, Aquatic exercise, Interventions.



## INTRODUCTION

One of the most popular paralympic sports is para swimming which includes participants who have a wide range of visual, physical, and intellectual impairments (Acebes-Sánchez et al., 2019; Austin et al., 2005). Para-swimming was first included in the Paralympic Games in Rome in 1960. It has one of the highest medals counts at the Paralympics Games alongside track and field, and cycling (Schipman et al., 2020). In Para Swimming, the inclusion criteria are eight physical impairments comprising: impaired muscle strength, impaired passive range of movement (ROM), limb deficiency, leg length difference, short stature, hypertonia, ataxia, and athetosis (Nicholson et al., 2018).

The benefits of swimming include rehabilitation, physical fitness, and promoting a sense of achievement (Ludtke et al., 2020). Some studies have used aquatic, swimming, and water-based exercises to improve psychological issues and quality of life for different statistical populations. Quality of life is a concept that is related to a person's emotional and physical well-being, interpersonal relations, personal development, self-determination, and social inclusion, as well as by affect, especially the experience of positive emotions. According to several studies, Swimming has excellent effects on physical ability (Danardani et al., 2018). Frohman et al. (Frohman et al., 2015) showed that aquatic conditioning might improve neurological functioning and impact positively on daily activities, safety, the maintenance of good health, and quality of life. Physical ability and physical fitness are strongly related to quality of life. Many experts recommend swimming as a sport that positively impacts physical and psychological health (Danardani et al., 2018; Frohman et al., 2015; Vedernikova et al., 2021). Doctors also recommend swimming as a sporting activity for children with disabilities (congenital or acquired) (Faul et al., 2009). Many studies (Nicholson et al., 2018; Schipman et al., 2020; Yfanti et al., 2014) have shown that swimming can help treat and prevent chronic disease and improve quality of life.

In the last two decades, the effect of music on variables like quality of life has been well studied. Ruud (Ruud, 1997) suggested how music can contribute to the quality of life in the following four areas: "1) music can increase our feeling of vitality and awareness of feeling, 2) music provides an

opportunity for increasing a sense of agency, 3) music-making provides a sense of belonging and community, and 4) experiences of music create a sense of meaning and coherence in life" (Ruud, 1997). Listening to music is considered an enjoyable experience because it distracts individuals from unpleasant experiences, decreases anxiety, and increases relationships (Solé et al., 2010). Recent research studies have examined the effects of music or music therapy interventions on the quality of life of people with dementia (Bize et al., 2007). Skurvydas et al. researched the topic of What Types of Exercise Are Best for Emotional Intelligence and Logical Thinking? - and found that swimming is a sport with one of the highest emotional intelligence rankings and can thus be effective in boosting emotional intelligence among its practitioners (Skurvydas et al., 2022).

Also, music can affect mental health. Some studies have mentioned the effect of music on mental health. But there is little research which studies the effect of music on emotional intelligence and investigates its effect alongside swimming or physical activity in individuals with physical disabilities.

The primary aim of this study is to examine the effect of increasing the number of training sessions on quality of life and emotional intelligence. The second aim was to investigate the effect of listening to music whilst exercising on quality of life and emotional intelligence. Additionally, making changes to the environment or atmosphere of people with disabilities can be more effective than when compared to the efficacy of changes made for people without any disorders or disabilities, so therefore, swimming can be very effective for people with a wide range of disabilities. Any programs for people with disabilities should address physical infrastructure as well as attitudinal and institutional issues. The way individuals with disabilities are viewed by society can have a significant bearing on their sporting lives and their self-confidence (Lin & Huang, 2019).

## METHODS

This research was carried out by following a pure experimental design with three intervention groups. The selected sample is characterized by its members presenting physical disabilities and participating in exercise programs in the water. A power analysis was conducted using G\*Power 3.1 (Ubago-Jiménez et al., 2019; Vedernikova et al., 2021), with power set at



0.80 to detect a medium-size effect ( $d = 0.5$ ) and  $\text{Alfa} = 0.05$ . The present study followed a cross-sectional and correlational design. The sample was selected through convenience sampling. Due to the characteristics of the design and considering the population size (100,000) with a confidence level of 95% and a margin of error of 8%, the estimated sample size was 150. This was increased by 10% to account for potential losses, resulting in a final sample size of 180. This sample size was divided into three groups, 1SPW (1 session of aquatic activities), 3SPW (3 sessions of aquatic activities), and 3SPWM (3 sessions of aquatic activities including one session with music), with 60 individuals adults in each group. A total of 180 physically disabled participants were selected, taking into account the number of weekly intervention sessions in the water. All of them were healthy in terms of hearing. Data was collected at the beginning and end of each aquatic activity session. The 1SPW group performed their routine water exercises once a week, the 3SPW group did their routine water exercises three times a week, as did the 3SPWM group, to which one session of musical aquatic activities was added. All subjects participated in their respective programs for 12 weeks. The mean age of the participants was  $29.01 \pm 11.07$  with an age range of between 15 and 44 years (See table 2). The inclusion criteria were: 1. To carry out aquatic activities either 1, 2 or 3 times weekly for at least 3 months. 2. Not to take specific medications linked to depression or anxiety that may affect quality of life or emotional perception. 3. Not presenting pathologies such as asthma or cardiovascular diseases that could have affected the successful completion of the programs. 4. To attend 85% of the sessions. Before collecting data, the research project was explained to participants, family members, and coaches. Data was collected and analyzed in such a way that subjects cannot be identified, directly or through subject-linked identifiers. In this study, the ethical standards contained in the Declaration of Helsinki were followed, and the participants signed an informed consent for the development of the research. Informed consent was obtained from all participants, but the data was collected using a questionnaire and this project was assigned the code HF01-1021-02.

#### *Data collection*

The participants were contacted through the East Azerbaijan Association of People with Disabilities.

Authorization was obtained, and the questionnaires were completed in person. Once all the authorizations had been collected, the study groups were formed. The data was collected between May and July 2022.

#### *Quality of life (QOL)*

WHOQOL-BREF questionnaire, a brief version of the WHOQOL-100, was used to assess the QoL (Nejat et al., 2006). The Persian version of WHOQOL-Bref was used, and it was reported that the validity of all subscales was more than 0.70, except for social relationships, which was 0.55. This questionnaire comprises 26 items divided into four sections: physical health, psychological health, social relations, and environmental issues. Each item was rated on a 5-point Likert scale from 1 (very poor/very dissatisfied/never/none) to 5 (very good/very satisfied/always/extremely). The higher the score, the better the subject's quality of life.

#### *Emotional intelligence (EI)*

The Schutte Self-Reported Emotional Intelligence Test (SSEIT) is a method of measuring general emotional intelligence. It contains 33 self-reported items which are rated using a Likert scale - a 1 to 5 scale of responses, ranging from one (strongly disagree) to five (strongly agree). This test has five subscales: emotional perception, utilizing emotions, managing self-relevant emotion, managing others' emotions, and uncategorized. Higher scores indicate greater emotional intelligence ranging from 33 to 165 points. This version was validated by (Hajibabae et al., 2018). The reliability and internal consistency of the Persian version of this questionnaire were reported to be 0.75 and 0.89, respectively.

#### *Measurements*

The data was collected at baseline and then again after the swimming sessions. Each group was made up of 60 individuals. 1SPW group carried out their routine exercises (1 session per week), while the number of sessions was increased to 3 sessions per week for the 3SPW group and 3SPW+music group, in which music was played during one training session. The routine program of training in this study was unchanged from the exercises subjects did in every session.

The weekly program of the athletes was as follows in the table below. However, depending on the ability,



level of fatigue, and the physical and mental vitality of the participants, there were sometimes changes to the intensity and volume of the exercises. An important point in this study was the simultaneous improvement of the training programs and the increase of training hours, which was something that the athletes' technical coach had to be conscious of when forming the groups and developing the training programs, whilst at the same time considering the essential knowledge and awareness of the swimmers.

**Table 1.** Exercise interventions.

Session 1 (2 Hours)			
<b>*1SPW</b>	General warm up 10 min / 6 min relaxing time (at their disposal) / Specific warm up 20 min / 6 min relaxing time (at their disposal) / 6rep freestyle 50 m (3 min rest) / 6 rep backstroke 50 m (3 min rest) / 10 to 20 min cool down.		
Session 1 (2 Hours)	Session 2 (2 Hours)	Session 3 (2 Hours)	
<b>*3SPW</b>	General warm up 10 min / 4 min relaxing time (at their disposal) / Specific warm up 15 min / 4 min relaxing time (at their disposal) / 8 rep freestyle 50 m (3 min rest) / 6 rep backstroke 50 m (3 min rest) / 8 to 15 min cool down.	General warm up 10 min / 6 min relaxing time (at their disposal) / Specific warm up 20 min / 6 min relaxing time (at their disposal) / 3 rep freestyle 50 m (3 min rest) / 3 rep stroke 50 m (3 min rest) / 3 rep backstroke 50 m (3 min rest) / 8 to 12 min cool down.	General warm up 8 min / 4 min relaxing time (at their disposal) / Specific warm up 15 min / 6 min relaxing time (at their disposal) / 3 rep freestyle 50 m (3 min rest) / 2 rep stroke 50 m (3 min rest) / 2 rep backstroke 50 m (3 min rest) / 3 rep freestyle 50 m (3 min rest) / 10 min cool down.
Session 1 (2 Hours)	Session 2 (2 Hours)	Session 3 & Music (2 Hours)	
<b>*3SPWM</b>	General warm up 10 min / 4 min relaxing time (at their disposal) / Specific warm up 15 min / 4 min relaxing time (at their disposal) / 8 rep freestyle 50 m (3 min rest) / 6 rep backstroke 50 m (3 min rest) / 8 to 15 min cool down.	General warm up 6 min / 3 min relaxing time (at their disposal) / Specific warm up 10 min / 3 min relaxing time (at their disposal) / 2 rep freestyle 50 m (2min rest) / 3 rep stroke 50 m (2min rest) / 3 rep backstroke 50 m (2min rest) / 2 rep butterfly 50 m (2min rest) / 10 min cool down.	General warm up 6 min / 3 min relaxing time (at their disposal) / Specific warm up 10 min / 3 min relaxing time (at their disposal) / 2 rep freestyle 50 m (2min rest) / 2 rep stroke 50 m (2min rest) / 2 rep backstroke 50 m (2min rest) / 2 rep butterfly 50 m (2min rest) / 20min conditioning According to individual differences and abilities with bands and dumbbell and swimming breathing technique. / 6 min cool down.

**Legend:** \*1SPW (1 session per week) \*3SPW (3 session per week) \*3SPWM (3 session per week and music). **Note 1:** Rest between training sets is listed in front of each movement. **Note 2:** Pre-workout exercises as warm-up and after exercise as cool-down were different according to the different disabilities of the athletes and were often done individually.

**Table 2.** Illustrates the descriptive measures of subject demographic characteristics.

	Groups		
	1SPW	3SPW	3SPWM
<b>Age</b> (years)	34,05±11,50	32,80±9,44	20,16±5,52
<b>Gender</b> (Male)	58,33%	70%	61,66%

*Statistical analysis*

Descriptive statistics were used to obtain the central tendency, deviation, and percentage metrics. First,

the descriptive analysis was done by stratifying the sample according to the number of aquatic training sessions. Next, the normality of continuous variables was analyzed using the Kolmogorov-Smirnov test. Finally, ANOVA followed by the Bonferroni test was used to compare the three groups (1SPW, 3SPW, 3SPWM) and determine the homogeneity of the groups at baseline. To determine the effect of the





programs in each of the groups, the students' t-test for related data was applied. In addition, a 3x2 multivariate analysis (Manova) was carried out to verify the differential effect of the programs depending on the moment of analysis, carrying out the Bonferroni goodness-of-fit test. All statistical analyzes were performed using SPSS version 25 (SPSS Inc., Chicago, IL, USA). The p-value was set at <0.05.

## RESULTS

A total of 180 participants with physical disabilities participated in this study. The average age across the

**Table 3.** Participants' overall scores on WHOQOL-BREF and SSEIT domains.

Variables	Domains	Group	Mean Score $\pm$ SD	F	Sig
Quality of life WHOQOL-BREF	Physical health	1SPW	33,92 $\pm$ 4,10	1,023	0,362
		3SPW	32,95 $\pm$ 3,53		
		3SPWM	33,61 $\pm$ 3,72		
	Psychological health	1SPW	32,03 $\pm$ 6,24	1,1174	0,312
		3SPW	30,76 $\pm$ 4,05		
		3SPWM	30,86 $\pm$ 4,64		
	Social relationship	1SPW	26,12 $\pm$ 8,63	1,647	0,196
		3SPW	23,63 $\pm$ 7,70		
		3SPWM	24,03 $\pm$ 7,84		
	Environment Health	1SPW	17,86 $\pm$ 3,26	0,549	0,578
		3SPW	18,23 $\pm$ 3,36		
		3SPWM	18,49 $\pm$ 3,22		
Emotional intelligence SSEIT	Perception of emotion	1SPW	26,58 $\pm$ 3,26	13,201	0,001
		3SPW	35,92 $\pm$ 5,38		
		3SPWM	37,42 $\pm$ 2,73		
	Managing own Emotion	1SPW	19,25 $\pm$ 3,11	4,317	0,015
		3SPW	20,55 $\pm$ 3,03		
		3SPWM	18,93 $\pm$ 3,42		
	Utilization emotion	1SPW	11,12 $\pm$ 1,51	15,588	0,001
		3SPW	14,60 $\pm$ 1,59		
		3SPWM	13,83 $\pm$ 2,24		
	Managing other Emotion	1SPW	14,78 $\pm$ 1,92	61,460	0,001
		3SPW	16,98 $\pm$ 2,75		
		3SPWM	16,30 $\pm$ 1,84		
	Uncategorized	1SPW	21,70 $\pm$ 5,58	13,410	0,001
		3SPW	26,20 $\pm$ 5,13		
		3SPWM	25,28 $\pm$ 4,30		

**Note:** 1SPW= 1 session per week; 3SPW= 3 sessions per week; 3SPWM= 3 sessions per week and music.

In Table 4, the effect of the intervention across all three groups has been analysed. Regarding the quality of life, the control group (1SPW) presented significant differences in the social relationship dimension, while the two experimental groups (3SPW and 3SPWM) presented differences in all the dimensions analysed. Regarding Emotional intelligence, differences were found in all the

three groups was 29, and all were men. Quality of life and emotional intelligence were assessed before and after a 12-week intervention. In Table 3, the ANOVA one-way analysis has been performed to check whether there were differences between the groups in the variables analysed - quality of life, and emotional intelligence. Unfortunately, statistical differences were recorded in the EI variables, so it cannot be considered a homogeneous group. Therefore, we need to find a way to assert that the post-intervention metrics are the final result.

dimensions analysed and across all three groups. Knowing that it is not a homogeneous group, it cannot be stated whether the results are due to the intervention since there are improvements in all three groups.

**Table 4.** Intra-group analysis (pre-post) of the WHOQOL-BREF and SSEIT variable.

Quality of life (WHOQOL-BREF)								
Groups	Variables	Mean difference	Sd	CI 95%		t	gl	Sig. (bilateral)
				Low	Up			
1SPW	Psychological health	-0,36662	2,88437	-1,11173	0,37849	-0,985	59	0,329
	Physical health	0,09239	5,79781	-1,40534	1,59012	0,123	59	0,902
	Social relationship	-3,41111	7,16272	-5,26144	-1,56078	-3,689	59	0,000
	Environment Health	-0,15625	0,89597	-0,38770	0,07520	-1,351	59	0,182
3SPW	Psychological health	-1,81321	3,53444	-2,72626	-0,90017	-3,974	59	0,000
	Physical health	-6,44183	6,72087	-8,17802	-4,70565	-7,424	59	0,000
	Social relationship	-7,72222	5,61749	-9,17337	-6,27107	-10,648	59	0,000
	Environment Health	-3,38542	7,32972	-5,27888	-1,49195	-3,578	59	0,001
3SPWM	Psychological health	-1,51293	3,55849	-2,43218	-0,59367	-3,293	59	0,002
	Physical health	-8,60067	4,67319	-9,80788	-7,39345	-14,256	59	0,000
	Social relationship	-9,68333	8,69085	-11,92842	-7,43825	-8,631	59	0,000
	Environment Health	-5,00000	8,30194	-7,14462	-2,85538	-4,665	59	0,000

  

Emotional intelligence (SSEIT)								
Groups	Variables	Mean difference	Sd	CI 95%		t	gl	Sig. (bilateral)
				Low	Up			
1SPW	Perception of emotion	-5,35000	6,92961	-7,14011	-3,55989	-5,980	59	0,000
	Managing own Emotion	-1,33333	4,59427	-2,52016	-0,14651	-2,248	59	0,028
	Managing other Emotion	-3,73333	3,60257	-4,66398	-2,80269	-8,027	59	0,000
	Utilization	-1,73333	3,17761	-2,55420	-0,91247	-4,225	59	0,000
	Uncategorized	0,60000	6,14845	-0,98831	2,18831	0,756	59	0,453
3SPW	Perception of emotion	-2,26667	6,81192	-4,02637	-0,50696	-2,577	59	0,012
	Managing own Emotion	-1,11667	4,05091	-2,16313	-0,07021	-2,135	59	0,037
	Managing other Emotion	-3,65000	3,80822	-4,63377	-2,66623	-7,424	59	0,000
	Utilization	-1,41667	2,58609	-2,08472	-0,74861	-4,243	59	0,000
	Uncategorized	0,98333	8,50621	-1,21405	3,18072	0,895	59	0,374
3SPWM	Perception of emotion	-2,96667	3,97009	-3,99225	-1,94108	-5,788	59	0,000
	Managing own Emotion	-3,43333	4,50373	-4,59677	-2,26990	-5,905	59	0,000
	Managing other Emotion	-4,08333	2,75122	-4,79405	-3,37262	-11,496	59	0,000
	Utilization	-1,78333	2,70023	-2,48088	-1,08579	-5,116	59	0,000
	Uncategorized	0,00000	6,48597	-1,67550	1,67550	0,000	59	1,000

**Note:** 1SPW= 1 session per week; 3SPW= 3 sessions per week; 3SPWM= 3 sessions per week and music.

Table 5 shows that the metrics regarding moment and group influence two domains in which quality of life is reflected (Physical and environmental health). In the intergroup analysis (Bonferroni), statistical differences have been identified in the Physical health dimension between the control group (1SPW)

and the 3SPW and 3SPWM groups ( $p=0.020$  and  $p=0.000$ , respectively). Identical behavior occurred in the Environment Health dimension, with values of  $p=0.012$  and  $p=0.000$  for the 3SPW and 3SPWM groups, respectively.

**Table 5.** Multivariate analysis of quality-of-life domains (MANOVA 2x2).

		WHOQOL-BREF	Sum of square	gl	Mean square	F	Sig
Group x Moment	Psychological health		34,968	2	17,484	1,370	0,255
	Physical health		1229,258	2	614,629	19,226	0,000
	Social relationship		617,724	2	308,862	4,447	0,112
	Environment Health		364,963	2	182,482	6,476	0,002



## DISCUSSION

This study analysed the effect of increased physical exercise on the quality of life and emotional intelligence of physically disabled people who practice swimming. It was found that their quality of life improved with the increased number of training sessions, whether music was included in the sessions or not. Emotional intelligence showed no improvement for this sample in the groups that increased their number of sessions and included the use of music, when compared to the group that only did one session.

The results confirm that the practice of aquatic activities three days a week produces improvements in the quality of life for a population of physically disabled people across all four dimensions analysed, with the most significant impact observed in the dimensions "Physical health" and "environment health." Furthermore, numerous studies report the benefits of taking part in PA on quality of life (Basaran et al., 2006; Biagini et al., 2022; Bize et al., 2007). Biagini et al. (2022) illustrated that participating in adapted physical activity for individuals with physical disabilities improves their quality of life when compared to that of people with physical disabilities who do not take part in any adapted sports. Moreover, Guedes et al. (2012) state, "being more physically active attributed higher scores to the sensory ability, autonomy, and intimacy domains, in addition to presenting a significantly higher overall quality of life, irrespective of age, marital status, educational level, and socioeconomic status" (Guedes et al., 2012). Therefore, the present study's results agree with those of previous studies. However, this research confirms the frequency of activity necessary to obtain concrete benefits and also the main areas where these positive effects are achieved. The prevalence of dissatisfaction about health and independence is high in people with disabilities. Physical activities improve health and independence, both of which are essential components in a higher quality of life. Also, the practice of physical activities leads to improvements in psychological health.

Based on the results of the present study, there were no significant differences between the three groups when they were analysed for EI. The explanation for these results may be in line with what was stated by Venegas (2011): that having a

disability may be a challenge that requires the development of personal and EI skills that allow individuals such as these to face difficult situations with adequate performance. This result can also be supported by the fact that when the quality-of-life metrics were analysed, the group that trained one hour a week (1SPW) only demonstrated statistical differences in the social relationship variable. The results may suggest a difference in the behavior of the population without physical disabilities since there are studies where people who perform beneficial physical activity have greater resilience and emotional management, and lower levels of psychological discomfort (San Román-Mata et al., 2020; Wang et al., 2020; Zysberg & Hemmel, 2018). However, in this research, with a higher level of PA, no improvements in EI were obtained. It should be noted that this is a sample that regularly takes part in PA, and this is an aspect to keep in mind and one which should be addressed more specifically in future research. Some studies show a positive association between the levels of EI and PA (Acebes-Sánchez et al., 2019; Li et al., 2009), although these studies were carried out on populations without physical impairment. One aspect that presents contradictory data relates to the EI values of people with disabilities compared to those without disabilities. Frequently, researchers have demonstrated and emphasized that individuals with disabilities have a lower QoL and IE than people without disabilities (Grassi et al., 2020; Kanwal & Mustafa, 2016; MacInnes, 2006; Spencer, 2007). However, research has also been published with contradictory results to these, where a population with disabilities presents EI values higher than those of a sample of people without disabilities (Fathirezaie et al., 2021; Gómez Díaz & Jiménez García, 2018).

Furthermore, based on the results of this study, listening to music during a training session does not affect the subjects' QoL. Therefore, music may only affect the psychological quality of life. Lee et al. (2010) reported that music positively affects the quality of life, and that musical activities can help individuals connect with their life experiences and with others (Lee et al., 2010). The results of Dreu et al. (2012) show that music-based movement could significantly improve gait and gait-related activities (de Dreu et al., 2012). These results are in line with





the present study. Quality of life refers to various aspects: physical functioning, bodily pain, general health, social functioning, emotional health, emotional role, and vitality. Thus, the studies mentioned above may suggest that improvements could be achieved in the dimension of psychological health, an aspect which needs to be confirmed in this study. Therefore, it seems that physical activity - specifically water-based activity - is essential for improving the quality of life in subjects with physical disabilities. Regarding the performance of PA with music, no differences were established in EI between this group and the group that did PA alone. Therefore, the program's effect may solely be the result of physical exercise, rather than music. These results are in line with the ones presented by Mohammadi Oranghi (Mohammadi Oranghi et al., 2019). According to Kim et al. (2018), research with students who played musical instruments, and who were taking part in a performance program, demonstrated that EI was not significantly affected (Kim & Kim, 2018). More time is needed for the effect of music to be significant.

#### Limitations

The variables related to emotional intelligence present behaviour such that comparisons cannot be made. The few studies found which do consider the

physically handicapped population mainly focus on older people, which is a limitation to their analysis and comparison. This has an unfortunate braking effect on the advance of knowledge in aspects such those covered by this investigation's analysis. For example, this study showed that playing music during swimming sessions can improve the psychological subscale more than by increasing the number of sessions per week. However, more studies are needed to show music's effect during training sessions. Two other aspects to highlight are, firstly, the limited number of studies that analyse the relationship between EI levels and PA, and more specifically, in populations with the characteristics of this study, and finally, the methodological differences in terms of the tools that are used for the assessment of EI.

#### CONCLUSIONS

Doing aquatic activities three days a week can improve the quality of life in individuals with a disability, but this activity did not affect people's emotional intelligence. On the other hand, listening to music while training swimming had no effect on their emotional intelligence and quality of life. Based on this and with the aim of optimizing the effects, it is recommended that physically disabled individual have water activities three days a week to increase the quality of life.

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