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Gender Differences in Perceived Barriers and Benefitsof Whole-Body Electromyostimulation Users: A Pilot Study

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Abstract: The importance of physical activity (PA) in people's health is well known. Today, sedentary lifestyles constitute a serious risk to global health. The likelihood that an individual will engage in PA depends largely on the perceived benefits and barriers to being physically active. The industry continues to create mechanisms to improve PA practice by minimizing the barriers. Thus, whole-body electrostimulation training (WB-EMS) emerged. Objective: To identify the main barriers and perceived benefits for WB-EMS users and to determine if there are differences between genders. Design: Cross-sectional study with 270 WB-EMS users from five countries. Results: There were no significant differences in barriers and perceived benefits between genders. Perceived benefits: enjoyment (70.3%), increased physical fitness (55.1%), personal accomplishment (53%), improve overall body (51.9%) and increase muscle strength (51.9%); Barriers: Take too much time from family (73.7%), take too much time from responsibilities (71.5%) and physical exercise (PE) takes a lot of time (67.4%). Conclusions: There were no significant differences between genders. The most prominent perceived benefits of using WB-EMS are enjoyment and increased physical health, and the main barriers are related to lack of time.

Keywords: WB-EMS; barriers and benefits; sports health; fitness; exercise; physical activity

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1. Introduction

The scientific literature is clear on the benefits of physical exercise (PE), which include: improved quality of life (QoL), aid in aging, prevention of metabolic diseases, decreased mortality and increased life expectancy [1–4].

The World Health Organization (WHO), in its 2021 guidelines on physical activity (PA) and sedentary behaviors, recommends that adults engage in at least 150–300 min per week of moderate-intensity aerobic PA, at least 75–150 min per week of vigorous-intensity aerobic PA or a combination of moderate- and vigorous-intensity equivalent PA during the week for substantial health benefits [5].

Although the benefits of PA are widely publicized and known, the rate of active people in the world is quite heterogeneous, being, on average, well below the expected values. The Eurobarometer of sport and physical activity 2017 shows that 46% of Europeans do not spend any time per week on PA, while in some countries, this figure exceeds 80% (Greece and Romania), and in others, such as Portugal, the number of regular practitioners has been decreasing (8% of the population in 2013 vs. 5% in 2017).

This reality of an increasingly sedentary society leads us to the need to know the reasons or barriers for people to practice or not practice this type of behavior. Bad weather, lack of discipline, time, money or premises for exercise are some of the main barriers identified [6–8]. In older populations, the barriers are more related to the existence of an illness or disability [9]. Another study conducted on women in the United States reports that, although they are aware of the great benefits of physical exercise (PE) and even report few barriers, their level of PA is very low [10].

On the other hand, new trends and ways of practicing fitness have emerged. Technology has been present in the top 10 fitness trends of the latest American College of Sports Medicine (ACSM, Indianapolis, IN, USA) reports through wearable devices, virtual workouts, live and on-demand online PE classes and the use of new technologies [11]. Whole body electrostimulation (WB-EMS) is an efficient, short-duration, technology-based training that has developed over the last decade and has attracted new users [12]. Through a technological suit (equipped with electrodes and controlled by a device), people perform exercises while receiving muscle contraction in 25-min sessions. The weekly frequency, according to the manufacturers, may vary according to the training objective; an average of two weekly sessions with 48 h rest between sessions is recommended.

Clinical trials with WB-EMS show benefits in the reduction of low back pain by improving quality of life [13,14], obesity treatment [15,16], osteoporosis and osteopenia [17,18], diabetics [19] and patients with cardio-metabolic risk [20]. Athletes have also benefited from the use of this technology, improving their performance [21–23] as well as the general population seeking to improve their well-being and body composition [24,25]. A recent systematic review and meta-analysis of 16 studies and 897 participants provided additional evidence of the effects of WB-EMS on body composition and strength in non-athletic adults [26]. The group that performed WB-EMS training had an increase in muscle mass and strength (leg and trunk extensors) compared to the group that trained without the suit. Regarding fat mass, no statistically significant differences were found in the group that trained with WB-EMS.

Since this training method is widely used around the world and has an increasing number of practitioners, it is important to understand what benefits and barriers users perceive. To our knowledge, this is the first study aimed at identifying the main barriers and perceived benefits of WB-EMS users. With the knowledge of the barriers and benefits of this training methodology, we hope to contribute to the development of better training programs and strategies, as well as to the enhancement of WB-EMS technology, in order to increase participation rates on the one hand and improve attendance and retention of its practitioners on the other.

The importance of barriers depends on the status of individual factors (e.g., self-discipline and convenience), social networks (e.g., social support), physical and macro environmental (e.g., availability and accessibility, distances, prices and media advertising) [27,28]. Some studies show that the role of men and women in society is different [29], so it is important to study the barriers and benefits separately and individually.

In terms of gender comparison, men tend to be more active and engaged in physical exercise than women [30–33], although there are no significant differences in barriers and benefits between gender in a study conducted among university students [34]. In contrast, a recent systematic review conducted in 20 countries in the Middle East and North Africa region noted that young females reported significant barriers related to lack of energy and mood, greater interest in other activities, concerns about physical appearance and time constraints due to academic responsibilities and family obligations compared to young males. In addition, boys place more importance on being good at sports, whereas girls focus on getting good grades and being attractive [35].

Therefore, the present study aims to (1) identify the most prevalent barriers and benefits of whole-body electromyostimulation training and (2) determine the gender differences in the barriers and benefits of WB-EMS users (see Supplementary Materials).

2. Materials and Methods

We conducted an exploratory-descriptive study that was carried out in 5 countries with a total of 270 whole-body electromyostimulation users. The study was conducted in accordance with the Declaration of Helsinki and was approved by the Bioethics Committee of the University of Extremadura, registration number 157/2021 on 29 September 2021.

2.1. Participants

A total of 270 WB-EMS users from 5 different countries participated in this study. Inclusion criteria were to be over 18 years of age and to have practiced WB-EMS for at least 1 month. All participants volunteered and gave written informed consent for inclusion in the study.

Participants conveyed they were predominantly women (74%, n = 199) and married (49.6%, n = 134), with a university degree (81%, n = 238). The mean age was 44,2 years (SD = 11.5), with the youngest participant being 18 years old and the oldest 71 years old. The participants' BMI (kg/m^2) mean was 24.5 (SD = 4.5), with most in the healthy weight range 55% (n = 148), while 33.5% (n = 90) were overweight and 10% (n = 27) obese. Most participants (64.1%, n = 173) reported that they had already practiced another activity besides WB-EMS training. Most of the participants (53.5%, n = 144) performed 2 sessions weekly of WB-EMS training, 38.1% (n = 103) performed once a week and 8.5% (n = 23) attended 3 times a week. Regarding training goals, 34.1% (n = 92) trained to lose weight while 31.1% (n = 84) trained to improve health and well-being, 29,6% (n = 80) to increase muscle mass and only 5.2% (n= 4) for rehabilitation.

2.2. Instruments

The questionnaire was developed by adapting the original version of the Exercise Benefit/Barriers Scale (EBBS) [36]. It is a 37-item quasi-Likert scale with five response alternatives. The score "one" corresponds to "strongly disagree" with the item, "two" to "disagree", "three" to "neither agree or disagree", "four" to "agree" and "five" to "strongly agree" with the statement. The Whole-Body Electromyostimulation Benefits and Barriers Scale is composed of two subscales: 27 items for the subscale of perceived benefits of exercise and 10 for the subscale of perceived barriers to exercise. In both subscales, a higher score corresponds to a higher perception of exercise. This adaptation proved to be valid through a confirmatory factor analysis performed with the following results: NNFI 2.25 (benefits) and 1.87 (barriers); CFI 0.94 (benefits) and 0.98 (barriers); CMIN/DF 0.91 (benefits) and 0.97 (barriers). Reliability was high with α Cronbach over 0.80 for both sub-scales and the Index of McDonald's Omega with 0.97 for benefits and 0.87 for barriers. IBM SPSS software (Version 25.0, IBM Corp., Armonk, NY, USA) was used to perform the statistical analysis. In addition, the exploratory analyses were carried out using the free statistical package Factor v.10.10.02 (Rovira I Virgili University: Tarragona, Spain), and the confirmatory factor analysis was carried out using the software package AMOS v.26.0.0 (IBM Corporation, Wexford, PA, USA).

2.3. Procedure

Participants were asked to complete a questionnaire. People from five different countries (Portugal, Brazil, Hungary, Belgium and Indonesia) participated in this study. Portugal and Brazil completed a Portuguese version, and the other three countries completed an international version in English. The questionnaire was made available via a QR code at the entrance of the studies, or a link was sent via phone message with prior authorization. Participants responded on their own mobile devices. The average response time to the questionnaire was 10 min.

2.4. Data Analysis

A Kolgomorov-Smirnov test was performed to study the normality of the data of the study variables. Descriptive statistics were used to analyze the barriers and benefits perceived by WB-EMS users, presenting the data in absolute and relative frequencies. Responses were grouped as agree and strongly agree and disagree and strongly disagree, and possible dependency relationships between users' benefits and barriers and gender were studied using a chi-square test. Finally, a z-test for independent proportions was performed, looking for possible differences in proportions between barriers and benefits perceived by men and women.

3. Results

Figure 1 shows the absolute and relative frequencies of the responses given by users to the questionnaire corresponding to the benefits perceived by WB-EMS users.

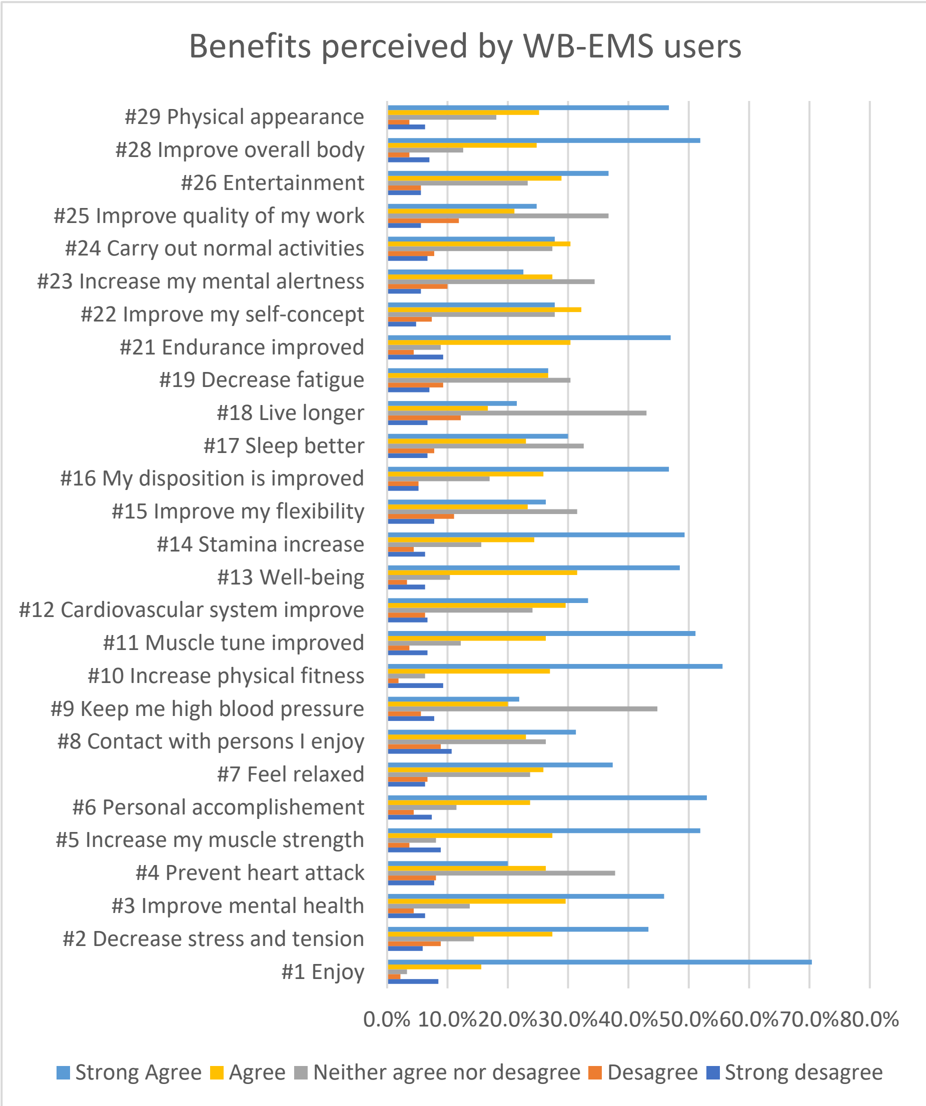

Figure 1. Benefits and Barriers of WB-EMS. Data presented in absolute and relative frequencies. # (Items' number in the questionnaire).

Among the perceived benefits, the following stand out: enjoyment (70.3%), increased physical fitness (55.1%), personal accomplishment (53%), improve overall body (51.9%) and increase my muscle strength (51.9%).

Figure 2 shows the absolute and relative frequencies of the responses given by WB-EMS users to the questionnaire on perceived barriers.

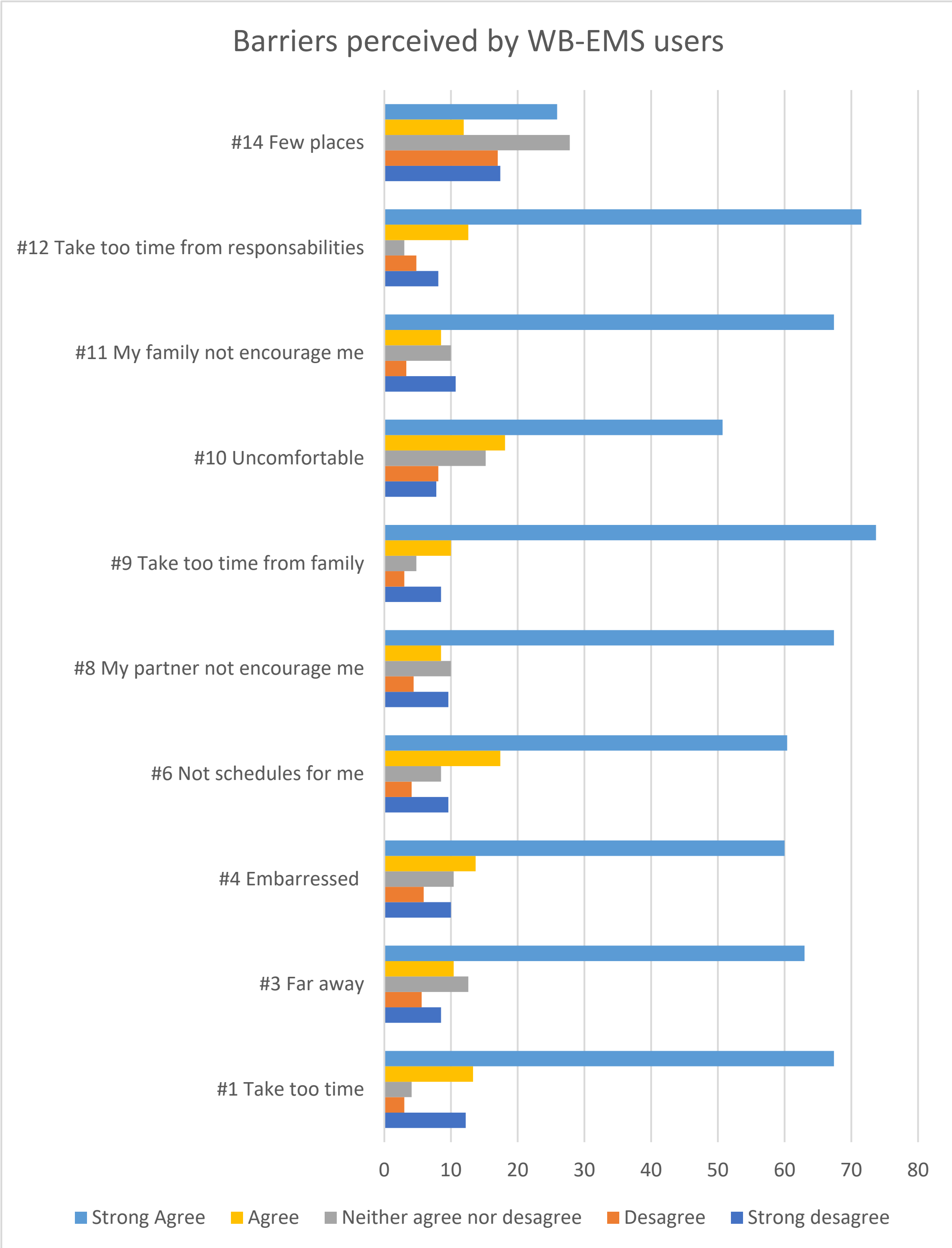

Figure 2. Barriers perceived by WB-EMS users. Data presented in absolute and relative frequencies. # (Items' number in the questionnaire).

It can be seen that the most common barriers are related to time. According to users, doing PE takes a lot of time (67.4%). This time is taken away from the family (73.7%), to the detriment of responsibilities (71.5%). The least mentioned barrier is the price of the activity (8.4%).

Figure 3 shows the relationship between the perceived benefits of WB-EMS training and gender.

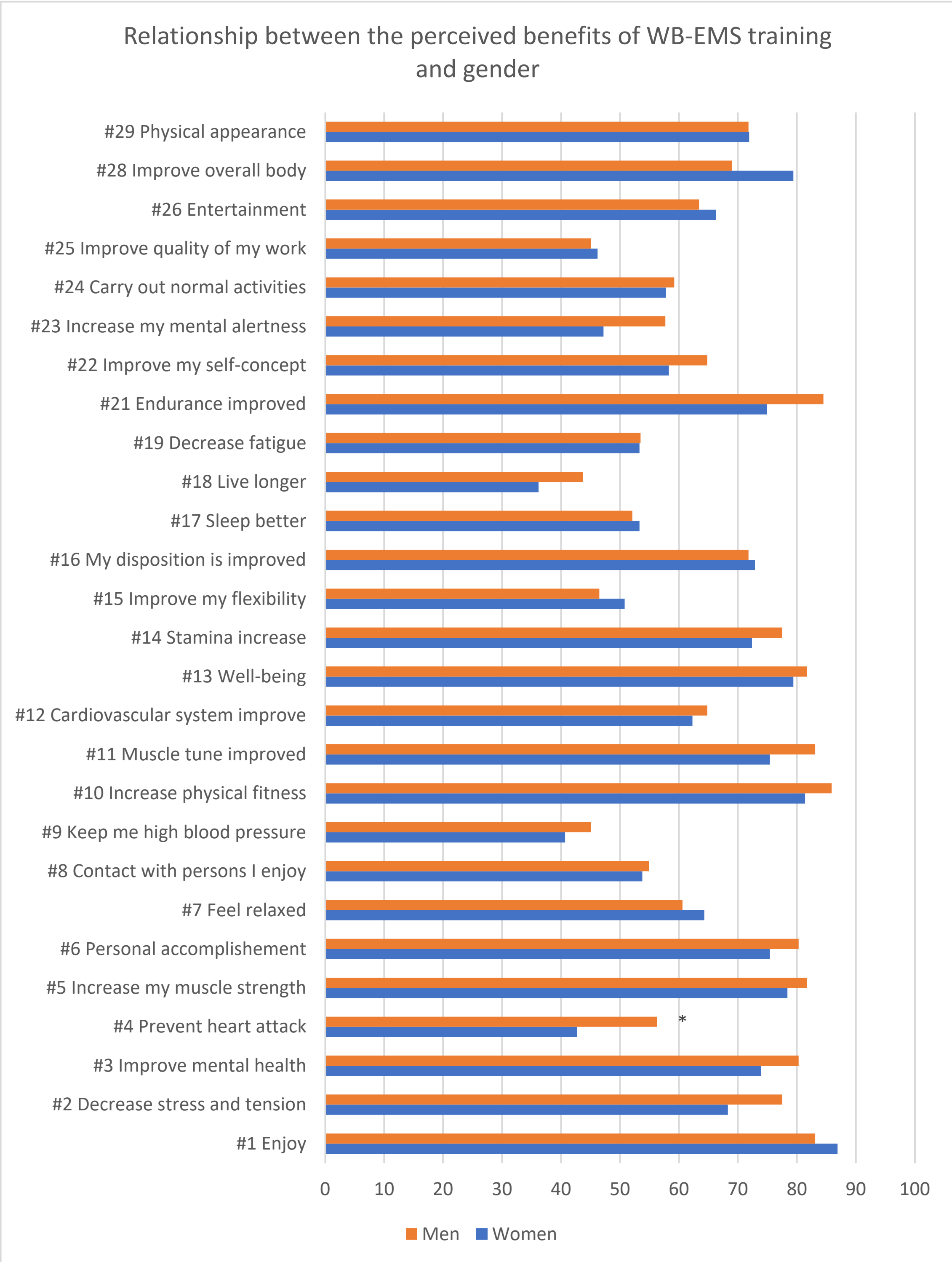

Figure 3. Perceived benefits (strongly agree or agree) from WB-EMS training and gender analysis. Data presented in absolute and relative frequencies; x^2 (Pearson's chi-square); df (Degrees of freedom); p (p-value from chi-square test); * (Significant differences between proportions in the z-test. $p < 0.05$).

No dependency relationships were found between the perceived benefits and the gender of the participants (Figure 3). Between genders, differences in proportions only were found in the perceived benefit "Prevent heart attack", with a higher proportion in men than in women ($p < 0.05$ in z-test).

Figure 4 shows the dependency relationship between perceived barriers and gender.

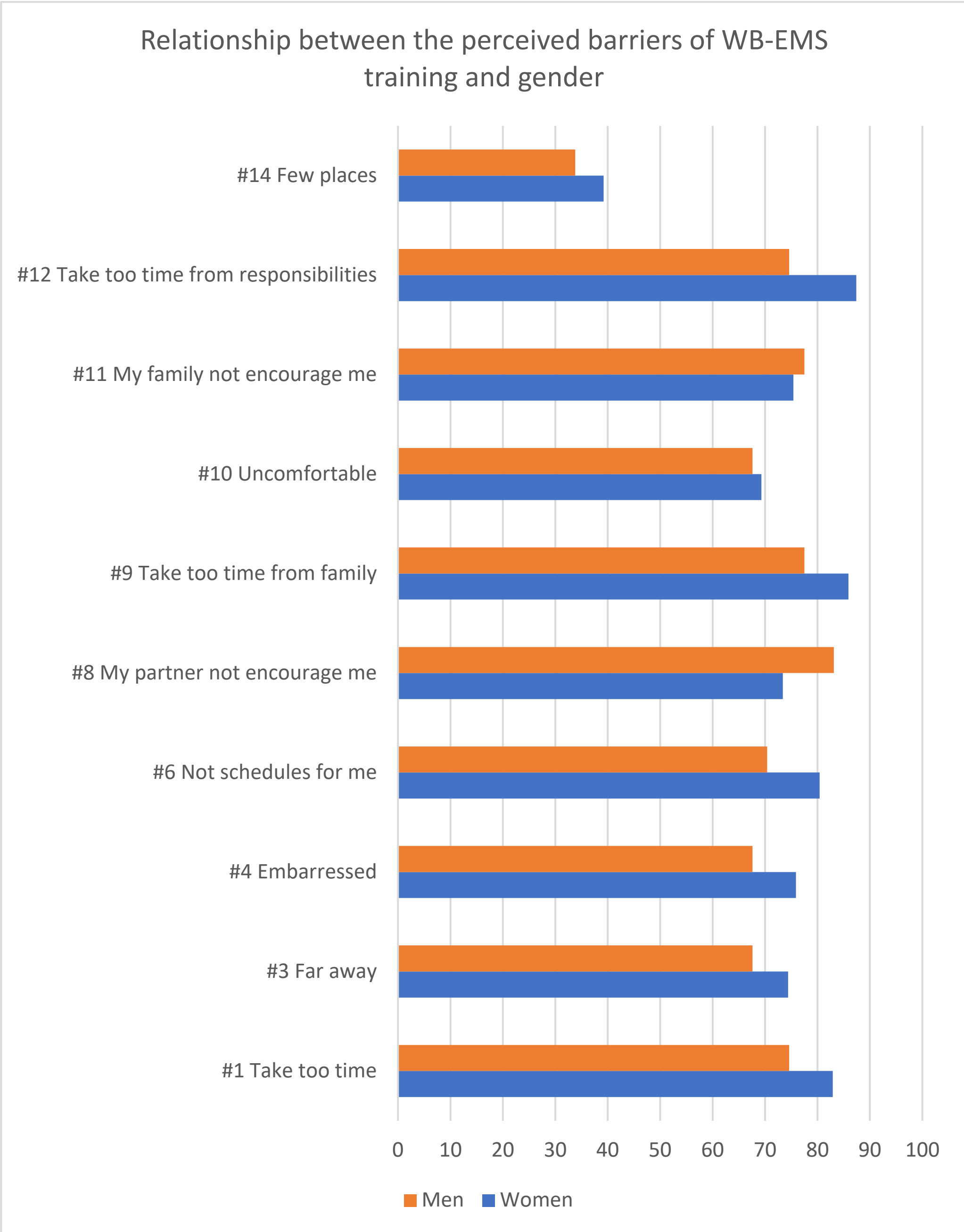

Figure 4. Perceived barriers (strongly agree or agree) from WB-EMS training and gender analysis. Data presented in absolute and relative frequencies; x^2 (Pearson's chi-square); df (Degrees of freedom); *p* (*p*-value from chi-square test); (Significant differences between proportions in the z-test. $p < 0.05$).

No dependency relationships were found between most of the perceived barriers and gender, only in the barrier "Take too much time from responsibilities" ($p < 0.003$, chi-square test), an item in which differences in proportions between genders were also found ($p < 0.05$, z-test).

4. Discussion

The main finding of this study shows us the perceived benefits of PE practice with WB-EMS, among which are: enjoyment, increased physical fitness, personal accomplishment, overall body improvement and increased muscle strength, as other 215 authors have shown in their studies, with a healthy population [24,25,37,38]. In relation to personal achievements, there is another study that supports our finding, in which Shajraw and colleagues [39] state that in the greatest perceived benefits in patients with myocardial infarction, 218 were related to personal factors, such as: I like to exercise, and also my physical performance, e.g., my muscle tone improves with exercise and exercising increases my endurance. There is little evidence from specific studies with WB-EMS on perceived benefits, hence our research.

There is no relationship between the perceived benefits and the gender of the participants. Between genders, statistically significant differences were only found in the perceived benefit of "Prevent myocardial infarction", with a higher proportion in men than in women [20].

Regarding gender, no relationship was found between most of the perceived barriers; only a statistically significant association was found in: "Spending too much time on responsibilities", where women were higher, perhaps due to the social and family burden that women have in today's society, where child-rearing and domestic responsibilities fall mostly on women, with women devoting more hours of their time than men [40]. However, other studies did find more differences between the genders showing that women are more likely to perceive the presence of barriers to PE practice, making it more difficult for them to practice PA than men [41].

The fact that the sample was small and that there was a large difference in the proportion of women and men (74% against 26%) in the selected sample, as well as that the age distribution was quite wide, could be one of the main reasons why we have not found significant differences.

Another important finding is related to the barriers that prevent users with WB-EMS from performing PE. The most frequent barriers are related to time (it takes time away from obligations, to the detriment of the family, and the practice takes too much time). Consistent with other authors [42], the main barriers to PA practice were the demands of work or family obligations and also lack of time [43,44]. Other authors, in addition to lack of time, include social influence and "lack of skills" as prevalent barriers in people with obesity [45]. Another study included as a barrier the lack of places to exercise and internal factors related to the effort itself, such as concern about fatigue during exercise participation in patients with myocardial infarction [39].

Based on the findings of this study, professionals and users of this training system can, on the one hand, try to reduce the barriers found here to reach more and more people and, on the other hand, be able to adapt the training taking into account the benefits perceived by current customers to offer an experience that meets user expectations. Although it has not been studied in this work, we believe that WB-EMS can be a means of attracting and encouraging people to do more physical exercise (especially those who do not like or do not want to do conventional training), as suggested by other authors (12, 25).

The main strength of this pilot study is that it is the first to study the motivations and barriers to the practice of new training, as is the case with the WB-EMS. In addition, the validation of the first questionnaire of barriers and benefits for this modality generates greater reliability for subsequent studies. As main limitations, we point out the use of a small and convenient sample that we cannot say is representative or generalized to all WB-EMS users. However, the lack of generalizability may introduce bias, as the sample may not be truly representative of the whole population of this demographic group. In addition, all survey responses were self-reported and, therefore, subject to reporting bias. Differences in exercise duration among participants, cultural differences due to living in different countries, as well as age and gender differences also constitute a limitation regarding the generalizability of the results found in this study.

5. Conclusions

The most prominent perceived benefits of WB-EMS are enjoyment and increased physical health, and the main barriers are related to lack of time. Understanding the WB-

EMS user's benefits and barriers is the first step in developing an appropriate intervention to promote physical activity and avoid sedentary lifestyles.

Supplementary Materials: The following supporting information can be downloaded at: https://www.mdpi.com/article/10.3390/su142215080/s1, Table S1: Benefits perceived by WB-EMS users; Table S2: Barriers perceived by WB-EMS users; Table S3: Perceived benefits (strongly agree or agree) from WB-EMS training and gender analysis; Table S4: Barriers perceived of WB-EMS training and gender analysis.

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