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ORIGINAL ARTICLE

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Validation and psychometric evaluation of the Polish version of the Exercise Addiction Inventory (EAI-PL)

BACKGROUND
Exercise addiction (EA) is manifested by loss of control over exercising and experiencing numerous negative consequences. One of the most commonly used psychometric instruments to assess the risk of exercise addiction is the six-item Exercise Addiction Inventory (EAI). The present study translated and validated the EAI into Polish and evaluated its psychometric properties.

PARTICIPANTS AND PROCEDURE
The study included 858 adult participants (54% female) aged between 18 and 69 years (M = 35.20, SD = 9.54) who exercised recreationally. Participants completed the EAI along with exercise-specific questions and basic demographics. Additionally, a subsample (n = 214) completed the Exercise Dependence Scale-Revised. Confirmatory factor analysis (CFA) was conducted to assess the construct validity of the Polish EAI. Convergent and criterion validity, as well as reliability, were also assessed.

RESULTS
The CFA confirmed the one-factor model with good fit statistics (comparative fit index and Tucker-Lewis index > .95, root-mean square error of approximation < .08). The EAI was invariant between men and women. Convergent validity was adequate. The scale's internal consistency was excellent (Cronbach's α = .91, McDonald's ω = .91, and composite reliability = .91).

CONCLUSIONS
The present study successfully validated the EAI among Polish adults. The results provide robust evidence concerning the scale's reliability, construct validity, and convergent validity, enabling further research on exercise addiction in Poland.

KEY WORDS
exercise addiction; exercise dependence; Exercise Addiction Inventory; psychometrics; Poland

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BACKGROUND

Regular exercise benefits both physical and psychological well-being (Posadzki et al., 2020). However, some individuals experience negative consequences from excessive exercise, including loss of control over such behavior (Berczik et al., 2012). The phenomenon has been conceptualized in different ways (Berczik et al., 2012; Hausenblas & Downs, 2002b), but the most common terms are 'exercise dependence' (Hausenblas & Downs, 2002b) and 'exercise addiction' (Terry et al., 2004). Exercise dependence was originally conceptualized by employing modified criteria of substance addiction from the DSM-IV (American Psychiatric Association, 1994): (i) tolerance, (ii) withdrawal, (iii) intention effect, (iv) lack of control, (v) time spent on the activity, (vi) reduction of other activities, and (vii) continuance (Hausenblas & Downs, 2002a, 2002b). Similarly, exercise addiction has been conceptualized based on the components model of addiction (Griffiths, 2005), and comprises salience, mood modification, tolerance, withdrawal symptoms, conflict, and relapse. It has also been argued that dependence is one of two components of addiction, the other being compulsion (Szabo & Demetrovics, 2022).

Psychometric measurement instruments have been developed for the two conceptualizations, of which the most widely used are the Exercise Dependence Scale-Revised (EDS-R; Hausenblas & Downs, 2002a), comprising 21 items (three per criterion), and the Exercise Addiction Inventory (Terry et al., 2004), comprising six items (one per criterion). Both instruments have been translated, adapted, and validated in numerous languages and extensively used in research over the past two decades (for reviews of these instruments, see Sicilia et al., 2021, 2022).

The EDS-R has been validated in Poland (Danych et al., 2019; Krzyżak-Szymańska & Szymański, 2023; Rowicka, 2023), whereas there has been no validation of the Exercise Addiction Inventory (EAI) for Polish researchers to use. Moreover, several psychometric evaluations of the EDS-R have shown that it does not adequately fit the aforementioned seven factors. For example, a French validation of the EDS-R reported that the two criteria of 'lack of control' and 'time spent on the activity' comprised a single factor (Allegre & Therme, 2008). In the Spanish validation study, it was reported that a five-factor model best fitted the data (the 'time spent on the activity' and 'reduction of other activities' factors were distributed between the factors of 'tolerance' and 'lack of control') (Pujals et al., 2018). Rowicka (2023) also reported that a five-factor model best fitted the data in a Polish study. Here, three original factors were confirmed ('withdrawal', 'lack of control' and 'continuance'), whereas the 'reduction of other activities' factor and 'time spent on the activity' factor were merged, as were the 'tolerance' and 'intention' factors. Other Polish studies investigating the Polish adaptation of the EDS-R have reported good internal consistency, suggesting that it is a reliable instrument (Danych et al., 2019; Krzyżak-Szymańska & Szymański, 2023).

The EAI is a brief and robust instrument that assesses the risk of exercise addiction and has shown good psychometric properties across various samples (see Griffiths et al., 2015), as well as convergent validity (Mónok et al., 2012). Moreover, the EAI is widely used internationally. For instance, a Google Scholar search conducted by the authors on April 19, 2024, identified over 1,000 published papers that had mentioned the Exercise Addiction Inventory. Therefore, the present study aimed to validate a Polish version of the EAI and evaluate its psychometric properties (i.e., internal consistency and reliability, construct validity, and convergent validity).

Indeed, the EAI is widely used to gauge the prevalence of exercise addiction in different nations. Notably, it has undergone adaptation to various languages, including Hungarian (Demetrivics & Kurimay, 2008; Mónok et al., 2012), Spanish (Sicilia et al., 2013), Danish (Lichtenstein et al., 2014), Italian (Gori et al., 2021), Mexican Spanish (Salazar et al., 2021), Persian (Akbari et al., 2023), and Turkish (Aydin et al., 2023). All of the validation studies have demonstrated that the EAI is a reliable tool with a Cronbach's α of .70 or above (with the exception of the Danish EAI with a Cronbach's α of .66 (Lichtenstein et al., 2014). The reported Cronbach's alphas in these studies were: .72 for the Hungarian EAI (Mónok et al., 2012), .70 for the Spanish EAI (Sicilia et al., 2013), .71 for the Italian EAI (Gori et al., 2021), .81 for the Mexican EAI (Salazar et al., 2021), .71 for the Persian EAI (Akbari et al., 2023), and .84 for the Turkish EAI (Aydin et al., 2023). The factorial loadings were also acceptable (above .30 [Field, 2013]): Hungarian EAI – .38-.72 (Mónok et al., 2012), Spanish EAI – .41-.59 (Sicilia et al., 2013), Persian EAI – .41-.71 (Akbari et al., 2023), Mexican EAI – .51-.79 (Salazar et al., 2021), and Turkish EAI – .36-.78 (Aydin et al., 2023). Finally, the goodness-of-fit indices were acceptable in all the validation studies when confirmatory factor analysis was conducted. In the case of Hungarian, Spanish, Italian, and Turkish validation studies, the values showed a very good fit to the unidimensional structure of the EAI (χ^2/df values were below 3, CFI > .95, RMSEA < .08).

In a study encompassing a cross-section of the Hungarian population aged 18-64 years, both the EAI and EDS (Hausenblas & Downs, 2002a, 2002b) were utilized (Mónok et al., 2012). The findings showed that the prevalence of exercise addiction ranged from 0.3% to 0.5% among adults, confirming the reliability of the Hungarian EAI for this purpose (Mónok et al., 2012; Szabo, 2021). Combining data from Hungary, the UK, Spain, the US, and Denmark, Griffiths et al.

(2015) confirmed the efficacy of the EAI in exploring covariates of exercise addiction across diverse cultures.

Given the EAI's international application and the absence of its Polish validation, the present study filled this gap by evaluating the EAI's psychometric properties in a Polish context. The existing Polish instrument (i.e., EDS-R) has reliability issues (Rowicka, 2023), and assesses only one aspect of exercise addiction (i.e., exercise dependence). It should also be noted that there are two revised versions of the EAI, but (to date) they have been rarely used. Therefore, to compare Polish research to the many international studies in the field, the original instrument was validated and evaluated.

It was hypothesized that the EAI would have good psychometric properties. More specifically it was hypothesized that (i) the factorial structure would be unidimensional, (ii) multivariate analysis would show that the scale is invariant between the sexes, and (iii) reliability indicators would show that the scale has good internal consistency. It was further hypothesized that the EAI and EDS-R would correlate positively (with at least a medium effect size).

PARTICIPANTS AND PROCEDURE

PARTICIPANTS

The present study used a convenience sample. The inclusion criteria for participation were (i) providing informed consent, (ii) being aged 18 years or above, and (iii) exercising recreationally (not competitively). The sample comprised 858 participants (54% female) aged between 18 and 69 years (M = 35.20, SD = 9.54). Out of the total sample, 216 participants (62% female), aged between 18 and 69 years (M = 31.94, SD = 11.29), also completed the EDS-R. Study participants engaged in different types of sports activities, but predominantly running/jogging (84%), cycling/roller skating (49%), gym activities (36%), and swimming (26%) (see Table 1).

MATERIALS

Demographics and exercise activity data regarding sex and age were collected. Two questions regarding exercise activities were asked. The first one was, "How many times per week do you exercise?" (Responses: less than once a week, once a week, twice a week, three times a week, four times a week, five times a week, every day, or almost every day). The second question was "How many hours per day do you exercise?" Using these responses, a third variable was created by multiplying the number of days by the daily number of hours to obtain the approximate number of weekly hours spent exercising by participants.

Exercise Addiction Inventory (EAI; Terry et al., 2004). The EAI was used to assess the risk of exercise addiction. The scale comprises six items corresponding to the components model of addiction (Griffiths, 2005). Each item (e.g., "Conflicts have arisen between me and my family and/or my partner about the amount of exercise I do") was rated on a five-point scale from 1 (*strongly disagree*) to 5 (*strongly agree*). Higher scores indicated a greater risk of exercise addiction. The translation process was performed according to the recommendations of Beaton et al. (2000). First, two independent translators translated from English to Polish (forward translation). One translator was a professional translator with over seven years of experience, and the other was a bilingual Polish and English psychologist. Following Beaton et al.'s (2000) recommendations, the first translator was not informed about the purpose or details of the translation, whereas the second translator was. Second, the two translators synthesized two versions and formulated an agreed-upon version. Third, the agreed-upon version was translated from Polish to English (back-translation). Contrary to what Beaton et al. suggested, only one back-translation was performed because it was almost identical to the original English version. Finally, a group comprising a psy-

Polish version of the Exercise Addiction Inventory (EAI-PL)

Table 1

Sports activities of the study participants

Type of activity	Total sample (N = 858)	
	n	%
Running	720	84
Cycling/roller skating/ skating	419	49
Gym	306	36
Swimming	221	26
Fitness	166	19
Yoga	79	9
Football	61	7
Weightlifting	76	9
Volleyball	50	6
Dancing	51	6
Boxing	43	5
Tennis	25	3
Climbing	21	2
Athletics	22	3
Basketball	14	2

chologist whose main field of research was addiction (the first author), language specialists (with a double degree in psychology and English language), and the translators agreed upon the final version (with no further changes). Appendix 1 provides the final translation of the scale.

Exercise Dependence Scale-Revised (EDS-R; Hausenblas & Downs, 2002a, 2002b; Polish version: Rowicka, 2023). The EDS-R was used to assess exercise dependence and provide additional data for testing convergent validity with the EAI. The scale consists of seven subscales (three items per subscale and 21 items in total). Items (e.g., "I exercise to avoid feeling anxious" [withdrawal], "I am unable to reduce how intensely I exercise" [loss of control]) were rated on a six-point scale from 1 (*never*) to 6 (*always*). Higher scores indicate a greater risk of exercise dependence. Internal consistency of the total scale was excellent (Cronbach's α = .91), although the Cronbach's α coefficients for subscales were between low and very good ('withdrawal' .68; 'lack of control' .63; 'continuance' .81; 'reduction of other activities' combined with 'time spent on the activity' .84; 'tolerance' combined with 'intention' .84).

PROCEDURE

The present study was conducted using the Lime Survey online platform. Information regarding the study was posted on various social media websites and Internet forums devoted to sports activities. Participation was anonymous. Participants were presented with the study's aim and description following the American Psychological Association (APA) Code of Ethics (APA, 2017). Informed consent was obtained from all participants. The participants consented by clicking on an "I agree" button, which allowed them to start answering the survey questions. First, demographic questions were asked, followed by questions on sports activity characteristics. Finally, they completed the EAI-PL. A smaller subsample completed the Polish Exercise Dependence Scale-Revised. Participants were not compensated in any way. The study received approval from the first author's institutional Ethics Committee (no. 5/2022).

DATA ANALYSIS

Analyses were conducted using SPSS version 27 and AMOS version 24. The factorial structure of the EAI-PL was investigated using confirmatory factor analysis (CFA). For the CFA, the chi-square statistic and the following goodness-of-fit indices were used to evaluate the model adequacy: comparative fit index (CFI), goodness of fit index (GFI), Tucker-Lewis index (TLI), root-mean square error of approximation (RMSEA) and standardized root mean square residual (SRMR). The CFI, the GFI, and the TLI indicate an adequate model fit for the data when values range between 0.90 and 0.95 and an excellent model fit when above 0.95 (Hu & Bentler, 1998). RMSEA values below .10 are acceptable (with a 95% confidence interval). To assess the metric and scalar invariances, the following criteria were applied: (i) the change in CFI between the metric and configural model and the scalar and the metric model should not exceed 0.01; (ii) the respective changes in RMSEA should not exceed 0.015; (iii) overall fit indices should be at least acceptable (Cheung & Rensvold, 2002; Kline, 2016).

Further psychometric properties of the EAI-PL were also investigated (Cronbach's α, McDonald's ω, composite reliability (CR), and convergent validity – average variance extracted (AVE) (Peterson & Kim, 2013). Correlations and CR above .70 indicate good internal consistency and reliability (Field, 2013). Moreover, Pearson and Spearman correlation coefficients were calculated (depending on the distribution of data) between the total score of EAI and EDS-R, as well as between EAI and time and frequency of exercising. Finally, a set of Mann-Whitney tests (with sex) was computed for age, EAI, EDS-R, and exercise-related variables (due to their distribution). Normal distribution was assumed when standardized skewness and kurtosis values did not exceed 3.29 (for a sample size greater than 100) (Mayers, 2013). Correlation coefficients between 0.10 and 0.39 are considered weak, between 0.40 and 0.69 moderate, and above 0.70 strong (Dancey & Reidy, 2017). The effect size for the non-parametric Mann-Whitney test was calculated using the rank-biserial correlation coefficient (r_b), which can be interpreted similarly to Pearson's correlation coefficient. When conducting group comparisons, *p*-values were adjusted with Bonferroni adjustment (due to multiple outcome variables).

To estimate the sample size for the validity examination, we used G*Power (Faul et al., 2007) and *t*-test correlation for parameters α = .05, β = .95, medium effect 0.30 (EAI and EDS-R). The analysis showed that 111 participants were needed to detect such an effect. We doubled the number to be able to test the effect separately for men and women (N = 222), although eight participants did not complete the EDS-R, and their answers were not taken into consideration.

RESULTS

EXERCISE CHARACTERISTICS

Study participants exercised between 10 minutes and 35 hours weekly, with the average being 4 hours and 38 minutes (278.98 minutes [*SD* = 194.79]). Participants exercised once a week (11%), two-three

Table 2

Descriptive statistics for age, weekly frequency and time of exercising, EAI, and EDS-R scores

Variables	*N*	*M*	*Me*	*SD*	Skewness	SE_{skew}	Z_{skew}	Kurtosis	SE_{kurt}	Z_{kurt}	Min	Max
Age	858	35.20	36.00	9.54	0.10	0.08	1.16	−0.53	0.17	−3.17	18	69
Weekly frequency of exercising	858	3.24	3.00	1.53	0.64	0.08	7.72	−0.21	0.17	−1.24	1	7
Time per week	858	278.99	240.00	194.80	2.84	0.08	34.06	14.60	0.17	87.54	10	2100
EAI score	858	18.43	19.00	5.58	−0.42	0.08	−4.85	−0.72	0.17	−4.24	6	30
EDS-R score	216*	53.93	51.00	18.03	0.94	0.17	5.66	1.06	0.33	3.21	22	126

Note. SE_{skew} – standard error for skewness; Z_{skew} – standardized skewness; SE_{kurt} – standard error for kurtosis; Z_{kurt} – standardized kurtosis; EAI score – Exercise Addiction Inventory summed score; EDS-R score – Exercise Dependence Scale-Revised total score (*EDS-R was only completed by a subsample).

Table 3

Factor loadings for Exercise Addiction Inventory (EAI) items

Item	EAI
Item 1	.81
Item 2	.76
Item 3	.75
Item 4	.82
Item 5	.81
Item 6	.81

Note. There was a covariance between the errors of item 1 and item 2 in the CFA (.24).

times a week (54%), every day (10%), or almost every day (10%) (*M* = 3.25 days, *SD* = 1.53) (see Table 2). At least 80% of the sample could be characterized as exercising recreationally in accordance with the World Health Organization (WHO, 2020) guidelines (i.e., at least 150 minutes a week of moderate-intensity aerobic physical activity). When taking into consideration that running can be considered an example of a vigorous-intensity aerobic physical activity, then 94% of the present sample exercised in accordance with the WHO (2020) guidelines.

CONSTRUCT VALIDITY OF THE EAI

CFA demonstrated a very good fit of the one-factor model to the data: $\chi^2(8) = 39.66$; $p < .001$; PCMIN/DF = 4.96; CFI = .990, TLI = .981, IFI = .990, RMSEA = .068, 90% CI [.048; .090]. Factor loading values were between .75 and .82, and were considered acceptable (detailed factor loadings are presented in Table 3).

ANALYSIS OF INVARIANCE BETWEEN GENDERS

A multigroup analysis was conducted to investigate whether the structure of the EAI was invariant between the sexes. The results presented in Table 4 show that the model presented configural, metric, and scalar invariance with excellent fit indices. Therefore, the invariance of the measurement model between genders was supported (Byrne et al., 1989; Marsh, 1993).

RELIABILITY

Analyses of EAI-PL demonstrated excellent internal consistency and reliability. The coefficient values were as follows: Cronbach's α = .91, McDonald's ω = .91, composite reliability = .91, and AVE = .63.

Table 4

Multi-group invariance analysis across gender

Model	CFI	RMSEA (90% CI)	ΔCFI	ΔRMSEA
Model 1	.981	.063 (.049-.077)		
Model 2	.978	.060 (.047-.073)	.003	.003
Model 3	.977	.055 (.043-.066)	.001	.005
Model 4	.976	.051 (.040-.062)	.001	.004

Note. Model 1 – configural invariance; Model 2 – metric invariance; Model 3 – scalar invariance, Model 4 – invariance of residuals/measurement errors.

CONVERGENT VALIDITY

The EAI-PL demonstrated a statistically significant association with the EDS-R ($r = .75$, $p < .001$), remaining at the same level for both males ($r = .73$, $p < .001$) and females ($r = .75$, $p < .001$).

AGE AND GENDER DIFFERENCES

The analysis showed that there were no age differences between males and females. Females exercised at a slightly lower weekly frequency than males, but the difference, although significant, can be considered negligible because of the effect size. Females also spent less time exercising than males and scored significantly lower on the EAI and EDS-R than did males. However, in each case, the effect sizes were very small, indicating that the differences, although significant, were minimal (Table 5). The risk of exercise addiction (EAI score ≥ 24; Terry et al., 2004) was significantly different between males and females ($\chi^2(1) = 6.01$, $p = .01$).

DISCUSSION

The present study investigated the psychometric properties and validity of the Exercise Addiction Inventory (EAI-PL) among Polish adults. The results demonstrated good and very good degrees of fit; the chi-square test was significant, which is not recommended, but the PCMIN/DF was below 5, which is acceptable (Tabachnick & Fidell, 2007). The remaining goodness-of-fit indices showed good model adequacy (CFI, TLI, IFI, and RMSEA). As in most other language validation studies (e.g., Aydin et al., 2023; Gori et al., 2021; Griffiths et al., 2015; Mónok et al., 2012; Sicilia et al., 2013), the six-item single-factor structure yielded a very good fit in the present study.

However, there was some covariance between items 1 and 2, which was not reported in the majority of other studies (e.g., Akbari et al., 2023; Aydin et al., 2023; Gori et al., 2021; Griffiths et al., 2015; Lichtenstein et al., 2014; Mónok et al., 2012; Sicilia et al., 2013; Salazar et al., 2021). However, Granziol et al. (2024) found similar issues with items 1 and 2; the investigation of the modification indices suggested covariance between these items in the case of Chinese, Turkish, and Japanese samples. Notwithstanding the similarity between the study by Granziol et al. (2024) and our study, any conclusions should be drawn with caution because the instruments investigated in the two studies were not the same, and the countries/languages were different.

The reliability indicators were excellent and similar to or better than those in other studies (Aydin et al., 2023; Griffiths et al., 2015; Salazar et al., 2021). Factor loadings in the Polish EAI (.75-.82) were higher than in other studies, whereas in other studies, they were as low as .41-.59 (Sicilia et al., 2013), and .36-.78 (Aydin et al., 2023). The present study's sample was diverse in age, ranging from young to late adulthood (18-69 years), similar to other validation studies (i.e., Aydin et al., 2023; Mónok et al., 2012) but unlike the Spanish adaptation, which was conducted with students, rather than a general population (Sicilia et al., 2013). Finally, the Polish EAI was invariant between female and male participants, which was corroborated by the presence of configural, metric, scalar, and residual invariances.

Like participants in the original validation study (Terry et al., 2004), all participants in the present study were recreational exercisers. However, it is important for future studies to investigate the psychometric properties and validity of this instrument among professionals engaged in sports. The participants engaged in various exercises (with running being the most prevalent exercise). The convergent validity results showed a high correlation between the EAI and EDS-R scores, similar to the results obtained in one of the only nationally representative studies examining exercise addiction (Mónok et al., 2012). There was also a small to moderate correlation between the EAI scores and the frequency of exercise and the time spent exercising. This is congruent with other studies and theoretical underpinnings, suggesting that addiction is not directly translated into the

time/frequency of a particular behavior (Egorov & Szabo, 2013).

Regarding gender differences, females spent significantly less time and frequency exercising and scored lower than males on both the EAI and the EDS-R, but the effect sizes were very small. These findings were consistent with those of a previous meta-analysis (Alcaraz-Ibáñez et al., 2022). Some authors have noted that because females develop eating disorders more frequently than males, eating disorders should be controlled for in studies investigating exercise addiction, because it is a potentially confounding variable (Tata et al., 2001). This should be investigated further.

While the present study yielded promising results for using the EAI in Polish research, further validation studies are necessary with the EAI-R (Szabo et al., 2019), which is the same scale but where responses are reported on a six-point (rather than a five-point) scale, and the EAI-3 (Granziol et al., 2024), which adds two new items (assessing feelings of guilt and training when injured). However, most studies in the extant literature have used the original EAI; therefore, the present study validated the original version so that international comparisons could be made.

LIMITATIONS

The present study had some limitations. The main weaknesses are that the data collected were self-reported and employed convenience sampling. Such data may be open to bias. However, scale validations are self-reported. It is also important to note that even though the EDS-R was included to evaluate convergent validity, the theoretical underpinnings of exercise addiction and dependence are not the same. The sample also included participants who engaged in organized/team-based sports, in which exercise addiction is highly unlikely (Griffiths et al., 2024). Moreover, it should be emphasized that the scales assess the presumed risk of exercise addiction that may never turn into morbidity (Szabo & Demetrovics, 2022). This might be one reason for exercise addiction not being included in the DSM-5 or ICD-11 classifications (although the main reason is the lack of high-quality research). Indeed, some authors have suggested that exercise addiction may be a symptom of mental

Table 5

Gender differences

	Gender	*N*	*M*	*Me*	*SD*	Skew	SE_{skew}	Z_{skew}	Kurt	SE_{kurt}	Z_{kurt}	Min	Max	*Z*	*p*	Effect size
Age	F	462	35.57	36.00	8.87	0.20	0.11	1.80	0.23	–0.06	–3.95	18	69	–0.98	.325	–
	M	396	34.77	36.00	10.26	0.05	0.12	0.38	–0.93	0.24	–3.82	18	59			
Frequency of exercising	F	462	3.18	3.00	1.67	0.73	0.11	6.46	–0.34	0.23	–1.48	1	7	–2.58	.010	.008
	M	396	3.32	3.00	1.35	0.51	0.12	4.15	–0.07	0.24	–0.29	1	7			
Time spent exercising per week	F	462	237.35	207.50	150.15	2.20	0.11	19.41	8.55	0.23	37.70	10	1260	–7.58	< .001	.067
	M	396	327.57	285.00	227.20	2.79	0.12	22.75	12.96	0.24	52.99	15	2100			
EAI score	F	462	17.63	18.00	5.81	–0.26	0.11	–2.31	–0.91	0.23	–4.03	6	30	–4.36	< .001	.022
	M	396	19.37	20.00	5.14	–0.59	0.12	–4.81	–0.37	0.24	–1.50	6	30			
EDS-R score	F	134	50.04	47.00	16.74	1.24	0.21	5.90	2.67	0.42	6.43	22	126	–4.22	< .001	.040
	M	314	60.28	55.50	18.36	0.64	0.27	2.41	0.05	0.53	0.09	22	109			

Note. F – female; M – male; Skew – skewness; SE_{skew} – standard error for skewness; Z_{skew} – standardized skewness; Kurt – kurtosis; SE_{kurt} – standard error for kurtosis; Z_{kurt} – standardized kurtosis; EAI score – Exercise Addiction Inventory summed score; EDS-R score – Exercise Dependence Scale-Revised total score; Z – Mann-Whitney test statistic; effect size for Mann-Whitney test – biserial correlation. Due to multiple outcome variables the adjusted *p*-value was calculated to be $p < .008$.

health dysfunction (e.g., muscle dysmorphia) rather than a dysfunction in itself (Foster et al., 2015; Szabo & Demetrovics, 2022).

Moreover, the sample comprised individuals who spent different amounts of time exercising (i.e., from 10 minutes a week to over 35 hours a week). The WHO guidelines recommend that individuals should spend at least 150 minutes per week engaging in moderate-intensity exercise or 75 minutes per week of more vigorous-intensity exercise. However, a recent meta-analysis by Zulyniak et al. (2020) differentiated non-exercisers, those who engaged in recreational exercise but did not meet the WHO guidelines for sufficient weekly exercise, and exercisers who met the WHO guidelines for sufficient weekly exercise. In the present study, 94% of the sample exercised at least 75 minutes per week, and 80% exercised at least 150 minutes a week. Therefore, a small minority of the sample engaged in minimal weekly exercise. This should be considered when interpreting the findings.

CONCLUSIONS

The present study successfully translated and validated the Exercise Addiction Inventory (EAI) among Polish adults engaged in recreational exercise. The results provide robust evidence of the scale's internal consistency and reliability, construct validity, and convergent validity. The latter was demonstrated by the significant correlation between the EAI and another scale assessing a highly similar phenomenon (i.e., the Exercise Dependence Scale). The present study's findings contribute to a better understanding of exercise addiction and offer a reliable psychometric assessment instrument for further research and clinical practice in the Polish context.

DATA AVAILABILITY

The data are available at the repository: https://doi.org/10.17605/OSF.IO/UB7XP

Disclosures

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The authors declare no conflict of interest.

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Appendix 1

Polish version of the Exercise Addiction Inventory (EAI-PL)

INSTRUCTION / INSTRUKCJA

Please indicate the extent to which you disagree or agree with the following statements / *Proszę określić, w jakim stopniu zgadza się lub nie zgadza się Pan/Pani z poniższymi stwierdzeniami*

(1) Strongly disagree / *zdecydowanie się nie zgadzam*
(2) Disagree / *nie zgadzam się*
(3) Neither agree nor disagree / *ani się zgadzam, ani nie zgadzam*
(4) Agree / *zgadzam się*
(5) Strongly agree / *zdecydowanie się zgadzam*

1. Exercise is the most important thing in my life / *Ćwiczenia są najważniejszą rzeczą w moim życiu*
2. Conflicts have arisen between me and my family and/or my partner about the amount of exercise I do / *W związku z tym, jak dużo ćwiczę, miewam kłótnie z moimi bliskimi*
3. I use exercise as a way of changing my mood (e.g., to get a buzz, to escape) / *Dzięki ćwiczeniom zmienia się mój nastrój (np. aby się odstresować, uciec itp.)*
4. Over time, I have increased the amount of exercise I do in a day / *Z czasem zwiększam ilość ćwiczeń, które wykonuję w ciągu dnia*
5. If I have to miss an exercise session, I feel moody and irritable / *Jeżeli z jakiegoś powodu muszę odpuścić sobie trening, robię się zły i zniecierpliwiony*
6. If I cut down the amount of exercise I do, and then start again, I always end up exercising as often as I did before / *Kiedy próbuję ograniczyć treningi, to po jakimś czasie i tak wracają do poprzedniej częstości*