

Trainer Communication as a Moderator of the Relationship Between Appearance-Related Social Media Consciousness and Exercise Addiction*

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Type: Research Article (**Received:** 09.01.2026 – **Accepted:** 20.06.2026)

Abstract

Appearance-related social media consciousness has been associated with maladaptive exercise-related tendencies, yet this association may vary depending on interpersonal conditions within fitness environments. This study examined the relationship between appearance-related social media consciousness and exercise addiction among adult fitness center members and tested whether trainer communication moderates this relationship. A total of 315 adult members of paid sports and fitness centers participated in the study (Mage = 31.43, SD = 9.14; 62.9% female). Data were collected using the Appearance-Related Social Media Consciousness Scale, the Exercise Addiction Scale, and a five-item researcher-developed Trainer Communication Questionnaire. Moderation analysis was conducted using Hayes' PROCESS macro Model 1 with 5,000 bootstrap samples. Appearance-related social media consciousness was positively associated with exercise addiction. Trainer communication significantly moderated this relationship: the positive association was stronger when trainer communication was low and became nonsignificant when trainer communication was high. These findings suggest that supportive trainer communication may serve as a contextual interpersonal buffer that attenuates the association between appearance-related social media consciousness and exercise addiction. Strengthening trainer communication practices may support healthier exercise engagement in fitness center settings.

Keywords: Exercise Addiction, Appearance-Related Social Media Consciousness, Trainer Communication, Moderation Analysis, Fitness

Introduction

In the digital era, social media platforms have become a central context in which body image ideals are produced, circulated, and evaluated. Visually oriented platforms such as Instagram and TikTok routinely present idealized representations of fitness, health, and physical attractiveness through filtered images, curated content, and influencer-driven narratives. Exposure to such content has been associated with heightened body image concerns and appearance-based self-evaluation, especially among young adults and individuals who are actively engaged in fitness environments (Fardouly et al., 2015; Holland & Tiggemann, 2016). Within this context, individuals may develop heightened sensitivity to appearance-related cues on social media, a process conceptualized in the present study as appearance-related social media consciousness. This construct refers to individuals' tendency to notice, monitor, compare, and evaluate appearance-related content encountered on social media platforms (Öngören et al., 2021).

A growing body of research indicates that elevated appearance-related social media consciousness is associated with maladaptive health-related outcomes, including body image concerns, disordered eating tendencies, and excessive exercise (Saiphoo & Vahedi, 2019; Tiggemann & Zaccardo, 2015). Although social media content may motivate some individuals to engage in physical activity, repeated exposure to appearance-focused fitness messages may also contribute to a shift from health-oriented exercise motives toward more externally regulated and appearance-driven exercise patterns. Such a shift is relevant to exercise addiction, which has been conceptualized as a behavioral pattern involving excessive commitment to exercise, tolerance, withdrawal-like symptoms, loss of control, and continued exercise despite negative consequences (Allegre et al., 2006; Griffiths et al., 2015; Terry et al., 2004). Previous research has also shown that exercise addiction may be associated with broader psychological and health-related correlates, including eating disorder symptoms, quality of life, personality traits, and attachment-related variables (Lichtenstein et al., 2014).

The link between appearance-related social media consciousness and maladaptive exercise tendencies can be further understood through social comparison and appearance-based self-evaluation processes. Social media environments provide frequent opportunities for individuals to compare their bodies with idealized images of peers, influencers, and fitness-oriented content creators. Such comparisons may intensify body dissatisfaction and increase the perceived importance of attaining socially valued appearance ideals (Perloff, 2014). In particular, negative appearance comparisons have been shown to help explain the association between social media use and body image concerns (Fardouly & Vartanian, 2015). For individuals who exercise in fitness settings, these appearance-based comparisons may contribute to viewing exercise less as a health- or enjoyment-oriented activity and more as a means of appearance regulation and external approval.

Self-Determination Theory (SDT) provides a useful framework for explaining why appearance-related social media consciousness may be associated with more maladaptive exercise tendencies. According to SDT, the quality of motivation is shaped by the extent to which individuals' basic psychological needs for autonomy, competence, and relatedness are supported or frustrated (Ryan & Deci, 2020), and this framework has been widely applied to understand motivation-related processes in physical activity and exercise contexts (Vasconcellos et al., 2020). In exercise contexts, autonomy refers to experiencing exercise as personally meaningful and self-endorsed; competence refers to feeling capable of improving one's physical abilities; and relatedness refers to feeling socially supported and connected

within the exercise environment. When these needs are supported, individuals are more likely to engage in exercise for health, enjoyment, personal growth, and functional improvement (Ryan & Deci, 2020; Teixeira et al., 2020).

In recreational fitness settings, these psychological needs may be supported or frustrated through everyday exercise experiences. Autonomy may be supported when members feel that their exercise goals are personally meaningful and that they have some choice in how they pursue them; conversely, it may be frustrated when exercise is experienced as pressure, obligation, or a response to external appearance standards (Ryan & Deci, 2020; Teixeira et al., 2020). Competence may be supported through clear instruction, realistic feedback, and visible progress, whereas repeated comparison with idealized bodies may undermine feelings of adequacy (Fardouly & Vartanian, 2015; Perloff, 2014). Relatedness may be supported when members feel respected, understood, and encouraged within the fitness environment, but it may be weakened when the environment is perceived as evaluative, competitive, or appearance-focused (Ryan & Deci, 2020; Ntoumanis et al., 2018).

This distinction is important because the same outward behavior—frequent exercise—may reflect different motivational qualities. When exercise is guided by autonomous motives, such as enjoyment, health, or personal development, it is more likely to remain flexible and adaptive (Ryan & Deci, 2020; Teixeira et al., 2020). However, when exercise is guided primarily by controlled motives, such as appearance-based approval, fear of falling short of body ideals, or the need to compensate for perceived physical inadequacy, it may become more rigid and difficult to regulate (Allegre et al., 2006; Griffiths et al., 2015). Building on this distinction, the present study approaches exercise addiction not merely as high exercise involvement, but as a potentially maladaptive pattern in which exercise becomes closely tied to external validation, appearance regulation, and reduced behavioral flexibility.

Appearance-focused social media content may intensify these controlled motives by increasing upward social comparison, external regulation, and conditional self-worth. Research on social media and body image indicates that appearance-based comparisons are associated with body dissatisfaction and body image concerns (Fardouly & Vartanian, 2015; Perloff, 2014; Saiphoo & Vahedi, 2019). Therefore, appearance-related social media consciousness is not assumed to directly cause exercise addiction; rather, it is conceptualized in the present study as a risk-related cognitive orientation that may be associated with more rigid or compulsive exercise tendencies when exercise becomes strongly tied to appearance regulation and external validation.

Although the literature reviewed above helps explain why appearance-related social media consciousness may be associated with maladaptive exercise tendencies, these individual and motivational pathways do not fully account for the interpersonal context in which exercise takes place. Recreational sports and fitness centers can be understood as socially embedded exercise environments in which members' exercise experiences may be shaped not only by personal motives, but also by repeated interactions with trainers and other members. In such settings, trainer communication may be particularly relevant because trainers often provide instruction, feedback, encouragement, and goal-related guidance during members' exercise routines.

The broader sport psychology literature has emphasized the importance of interpersonal relationships in sport and exercise contexts. For example, Jowett and Ntoumanis

(2004) developed the Coach–Athlete Relationship Questionnaire to assess relational qualities in sport settings, while Jowett (2007) highlighted closeness, commitment, complementarity, and co-orientation as central dimensions of coach–athlete relationships. However, the present study does not aim to assess the full multidimensional coach–athlete relationship. Instead, it focuses more narrowly on members' perceptions of trainer communication in recreational fitness settings, particularly communication related to motivation, health- and fitness-related guidance, individualized attention, instructional clarity, and healthy-living role modeling.

From an SDT perspective, supportive communication may help members interpret exercise goals in a more autonomous and health-oriented manner. Communication that provides clear instruction, realistic feedback, encouragement, and sensitivity to individual goals may support perceived competence and relatedness, whereas controlling, appearance-focused, or dismissive communication may reinforce external pressure and controlled forms of motivation (Ntoumanis et al., 2018; Ryan & Deci, 2020; Teixeira et al., 2020). Building on this literature, the present study conceptualizes trainer communication as a contextual interpersonal factor that may attenuate the association between appearance-related social media consciousness and exercise addiction, rather than as a direct protective mechanism.

In this study, supportive trainer communication is understood as communication that motivates members, provides clear and accurate exercise instruction, acknowledges individual goals and needs, supports health- and fitness-related progress, and models a healthy approach to exercise. Such communication may help members place greater emphasis on functionality, health, skill development, and personal progress rather than evaluating exercise primarily through appearance-related outcomes, which is consistent with SDT-based views on autonomy-supportive and competence-supportive exercise environments (Ryan & Deci, 2020; Teixeira et al., 2020). In contrast, when trainer communication is perceived as weak, impersonal, or insufficiently supportive, members may have fewer interpersonal resources within the fitness environment to counterbalance appearance-focused messages encountered on social media. Although coach–athlete relationship research has demonstrated the importance of interpersonal relationship qualities in sport contexts (Jowett, 2007; Jowett & Ntoumanis, 2004), less is known about whether everyday trainer communication moderates the association between appearance-related social media consciousness and exercise addiction among recreational fitness center members. Accordingly, trainer communication is expected to weaken, rather than eliminate, this association.

Taken together, previous research suggests that appearance-focused social media processes may be linked to body image concerns and maladaptive exercise-related tendencies, while sport and exercise psychology research highlights the importance of interpersonal relationships and communication in shaping exercise experiences. However, these two lines of research have rarely been integrated in recreational fitness center samples. In particular, it remains unclear whether members' perceptions of trainer communication change the strength of the association between appearance-related social media consciousness and exercise addiction. Addressing this gap is important because fitness center members are simultaneously exposed to digital appearance ideals and to interpersonal feedback, instruction, and encouragement within their exercise environments.

Accordingly, the present study aimed to examine the relationship between appearance-related social media consciousness and exercise addiction among adult fitness center members in Türkiye and to test whether trainer communication moderates this relationship.

Rather than treating trainer communication as a direct protective mechanism, the study conceptualized it as a contextual interpersonal factor that may attenuate the association between appearance-related social media consciousness and exercise addiction. By focusing on recreational fitness center members, the study seeks to clarify how digital appearance-related processes and everyday trainer communication may jointly relate to maladaptive exercise tendencies.

The Turkish context also provides a relevant setting for examining this model. Recent studies conducted in Türkiye have linked exercise addiction with body-related psychosocial variables among exercisers and fitness participants. For example, Doğan et al. (2022) reported positive associations between social appearance anxiety and specific symptoms of exercise addiction among exercise participants. Similarly, Hazar and Özpolat (2023) found that exercise addiction was positively associated with social appearance anxiety among individuals exercising in fitness settings, while Kutlu et al. (2023) showed that exercise addiction scores differed according to exercise purpose and were higher among individuals exercising for bodybuilding compared with those exercising for health. More recently, Erdoğan et al. (2024) reported a positive relationship between exercise addiction and physical appearance perfectionism among individuals attending fitness centers.

Although these Turkish studies provide important evidence that body-related concerns are associated with exercise addiction, they have generally focused on direct associations involving social appearance anxiety, physical appearance perfectionism, exercise purpose, or related psychosocial variables. Less is known about whether appearance-related social media consciousness is associated with exercise addiction and whether this association varies according to interpersonal conditions within fitness centers. Moreover, although social media-related variables have been examined among active fitness participants in Türkiye, previous work has not specifically addressed the moderating role of trainer communication in the relationship between appearance-related social media consciousness and exercise addiction. Therefore, the present study contributes to the Turkish literature by integrating digital appearance-related processes with trainer communication in a recreational fitness center context.

Based on the theoretical and empirical arguments presented above, the following hypotheses were proposed: H1: Appearance-related social media consciousness is positively associated with exercise addiction. H2: Trainer communication moderates the relationship between appearance-related social media consciousness and exercise addiction. H3: The positive association between appearance-related social media consciousness and exercise addiction is stronger when trainer communication is low and weaker when trainer communication is high.

Material and Method

Ethical Approval

This study was approved by the Kırıkkale University Social and Human Sciences Research Ethics Committee (Approval No: 2025/06/23; decision date: June 17, 2025). All procedures were conducted in accordance with the ethical principles of the Declaration of Helsinki and its later amendments. Written informed consent was obtained from all participants prior to data collection.

Research Design

This study employed a cross-sectional, correlational research design to examine the relationship between appearance-related social media consciousness and exercise addiction, and to test the moderating role of trainer communication. The hypothesized model was tested using regression-based moderation analysis in accordance with Hayes' PROCESS framework (Model 1).

Participants and Procedure

The study sample consisted of 315 adult members of paid sports and fitness centers located in Ankara and Kırıkkale, Türkiye. Participants were recruited using a convenience sampling method. The inclusion criteria were being 18 years of age or older and holding an active membership in a paid sports or fitness center at the time of data collection. The type of sports or fitness center was not restricted, provided that membership was fee-based and participation was ongoing during the data collection period.

The mean age of the participants was 31.43 years ($SD = 9.14$), with ages ranging from 18 to 61 years. Of the participants, 198 were female (62.9%) and 117 were male (37.1%). Regarding membership duration, 52.7% of the participants reported being members for 1–3 years, 32.7% for 4–7 years, and 14.6% for 8 years or longer. With respect to weekly exercise frequency, 65.7% reported exercising 3–4 days per week, 21.0% exercised 1–2 days per week, and 13.3% exercised 5 days or more per week. The demographic characteristics of the participants are presented in Table 1.

Data were collected between June 18, 2025 and August 30, 2025 using a mixed-mode approach combining online questionnaires and paper-and-pencil forms. Participation was voluntary, and participants were informed about the purpose of the study, the confidentiality and anonymity of their responses, and their right to withdraw from the study before providing informed consent. No missing data were observed in the final dataset.

Table 1. Demographic Characteristics of the Participants (N = 315)

Variable	Category	n	%
Gender	Male	117	37.1
	Female	198	62.9
Age (years)	Mean (SD)	31.43 (9.14)	–
	Range	18–61	–
Membership Duration	1–3 years	166	52.7
	4–7 years	103	32.7
	8 years and more	46	14.6
Weekly Exercise Frequency	1–2 days	66	21.0
	3–4 days	207	65.7
	5 days or more	42	13.3

Data Collection Tools

Data were collected using a researcher-developed Personal Information Form, two standardized scales, and a five-item researcher-developed Trainer Communication Questionnaire. Participants provided self-reported responses.

Demographic Information Form: Demographic characteristics were assessed using a researcher-developed form. Participants reported their age, gender, duration of membership in the sports center, and weekly exercise frequency. Age was recorded as a continuous variable, whereas gender was coded dichotomously (1 = male, 2 = female). Membership duration and weekly exercise frequency were measured using ordinal categories reflecting participants' engagement history in sports and fitness centers.

Appearance-Related Social Media Consciousness Scale: Appearance-related social media consciousness was measured using the Appearance-Related Social Media Consciousness Scale, which was adapted into Turkish as the Görünümle İlişkili Sosyal Medya Bilinç Ölçeği by Öngören et al. (2021). The scale consists of 13 items and is designed to assess individuals' awareness, attention, and cognitive engagement with appearance-related content encountered on social media platforms.

Items are rated on a 7-point Likert-type scale ranging from 1 = strongly disagree to 7 = strongly agree, with higher scores indicating higher levels of appearance-related social media consciousness. The original Turkish adaptation study reported evidence supporting the validity and reliability of the scale (Öngören et al., 2021).

In the present study, confirmatory factor analysis was conducted to examine the measurement properties of the scale prior to hypothesis testing. Standardized factor loadings were used to evaluate item-level performance, and internal consistency was assessed using Cronbach's alpha and McDonald's omega coefficients.

Exercise Addiction Scale: Exercise addiction was assessed using the Exercise Addiction Scale, originally developed in Turkish as the Egzersiz Bağımlılığı Ölçeği (EBÖ): Geçerlik ve Güvenirlilik Çalışması by Tekkurşun Demir et al. (2018). The scale consists of 17 items rated on a 5-point Likert-type scale ranging from 1 = never to 5 = always, with higher scores indicating higher levels of exercise addiction.

In its original validation study, the scale demonstrated a three-factor structure: Excessive Focus and Mood Modification (7 items), Postponement of Individual and Social Needs and Conflict (6 items), and Tolerance Development and Passion (4 items), together explaining 54.61% of the total variance. The scale also provides interpretive classification thresholds based on total score ranges, allowing individuals to be categorized according to overall exercise addiction levels.

Although the Exercise Addiction Scale was originally developed as a multidimensional instrument, the present study employed the total score to represent overall exercise addiction. This decision was guided by two considerations: first, the present study aimed to test a regression-based moderation model using overall exercise addiction as the outcome variable; second, the scale's interpretive cut-off points and risk classifications are based on total scores rather than subscale scores. Accordingly, exercise addiction was treated as a composite observed variable, and the total score was used in all subsequent correlational and conditional process analyses. The implications of not re-testing the original multidimensional structure in the present sample are addressed in the Discussion section.

Trainer Communication Questionnaire: Trainer communication was assessed using the Trainer Communication Questionnaire, a five-item researcher-developed Likert-type

questionnaire prepared specifically for the purposes of the present moderation model. The questionnaire was designed to capture members' perceptions of trainer communication in relation to motivational support, health- and fitness-related guidance, individualized attention, instructional clarity, and healthy-living role modeling. Items were rated on a 5-point Likert-type scale ranging from 1 = strongly disagree to 5 = strongly agree, with higher scores indicating more favorable perceptions of trainer communication.

The items were as follows: "My trainer has a communication style that motivates me during training"; "My trainer helps me improve my physical health and fitness goals"; "My trainer recommends exercises by considering my individual needs and goals"; "My trainer teaches exercise movements accurately and effectively"; and "My trainer serves as an inspiring role model for healthy living."

A researcher-developed questionnaire was preferred because the present study did not aim to assess the full multidimensional coach–athlete relationship, but rather to capture members' practical perceptions of trainer communication within commercial fitness center settings. Existing coach–athlete relationship instruments generally focus on competitive sport relationships and broader relational constructs, whereas the present study required a brief context-specific indicator of communication experiences relevant to motivation, guidance, instruction, and healthy-living support in recreational exercise environments. Therefore, the questionnaire was used as a context-specific observed measure rather than as a fully validated standalone psychometric scale.

Before hypothesis testing, internal consistency, item performance, and the one-factor structure of the questionnaire were examined to assess its suitability for inclusion in the regression-based moderation model.

Data Analysis

All statistical analyses were conducted using IBM SPSS Statistics 26 and AMOS 24. Before the main analyses, the dataset was screened for missing data, distributional assumptions, and multivariate outliers. No missing data were observed in the final dataset. Cases identified as multivariate outliers during data screening were excluded, and all analyses were conducted using the final sample of 315 participants.

Preliminary Analyses: Preliminary analyses included screening for missing data, distributional assumptions, and outliers. Univariate normality was assessed using skewness and kurtosis values, which were evaluated against commonly accepted thresholds of ± 2 . Multivariate outliers were identified using Mahalanobis distance (D^2), and cases exceeding the critical chi-square value were excluded from further analyses.

Descriptive statistics, including means and standard deviations, were computed for all study variables. Pearson product–moment correlation coefficients were calculated to examine bivariate associations among the variables and to assess potential multicollinearity prior to the regression-based moderation analysis.

Confirmatory Factor Analysis and Construct Validity: Confirmatory factor analysis (CFA) was conducted using AMOS 24 to examine the measurement properties of the Appearance-Related Social Media Consciousness Scale and to evaluate whether the five items of the Trainer Communication Questionnaire could be represented as a single composite

indicator for use in the moderation model. Maximum likelihood estimation was used. Because the Trainer Communication Questionnaire was developed for the purposes of the present study, the CFA results for this instrument were interpreted as preliminary evidence of dimensional suitability rather than as full validation of a standalone psychometric scale.

Model fit was evaluated using multiple goodness-of-fit indices, including the chi-square to degrees of freedom ratio (χ^2/df), Comparative Fit Index (CFI), Tucker–Lewis Index (TLI), Root Mean Square Error of Approximation (RMSEA), and Standardized Root Mean Square Residual (SRMR). In line with conventional recommendations, χ^2/df values below 5, CFI and TLI values of .90 or higher, RMSEA values of .08 or lower, and SRMR values of .08 or lower were considered indicative of acceptable model fit; stricter values were interpreted as evidence of better fit (Hu & Bentler, 1999).

Reliability Analysis: Internal consistency was examined for the two standardized scales and the Trainer Communication Questionnaire using Cronbach’s alpha (α) and McDonald’s omega (ω). Values of .70 or higher were considered indicative of acceptable internal consistency.

Moderation Analysis: The hypothesized moderation model was tested using Hayes’ PROCESS macro (Version 5.0), Model 1. Appearance-related social media consciousness was specified as the independent variable (X), exercise addiction as the dependent variable (Y), and trainer communication as the moderator (W). Predictor variables were mean-centered prior to analysis to facilitate interpretation of the interaction term. Heteroskedasticity-consistent standard errors (HC4) were used. Conditional effects were examined using simple slope analyses at low (-1 SD), mean, and high ($+1$ SD) levels of trainer communication.

Findings

Descriptive Statistics and Correlations

Descriptive statistics and Pearson product–moment correlations among the study variables are presented in Table 2. Appearance-related social media consciousness, exercise addiction, and trainer communication showed sufficient variability for further analysis.

Exercise addiction was positively and significantly correlated with appearance-related social media consciousness ($r = .24$, $p < .01$) and trainer communication ($r = .16$, $p < .01$). The correlation between appearance-related social media consciousness and trainer communication was not statistically significant. The magnitude of the correlations ranged from small to moderate, and no correlation exceeded the commonly accepted threshold for multicollinearity ($r < .80$).

These findings indicate that the variables were suitable for inclusion in the regression-based moderation analysis.

Table 2. Means, Standard Deviations, and Correlations Among Study Variables (N = 315)

Variables	M	SD	1	2	3
1. Appearance-Related Social Media Consciousness Scale	3.51	1.23	—		
2. Exercise Addiction Scale	3.43	0.55	.24**	—	

Variables	M	SD	1	2	3
3. Trainer Communication Questionnaire	4.26	0.59	-.02	.16**	—

Note. Pearson correlation coefficients are reported. $p < .01$ (two-tailed).

Reliability Analysis

The internal consistency of the study measures was examined using Cronbach's alpha (α) and McDonald's omega (ω) coefficients. In line with methodological recommendations, values of .70 and above were considered indicative of acceptable reliability. Given the known limitations of Cronbach's alpha under violations of tau-equivalence, McDonald's omega was additionally reported to provide a more robust estimate of internal consistency. All reliability analyses were conducted on the final dataset consisting of 315 participants after outlier screening.

Table 3. Reliability Coefficients of the Study Measures

Measure	Number of Items	α	ω
Appearance-Related Social Media Consciousness Scale	13	.931	.929
Exercise Addiction Scale	17	.855	.808
Trainer Communication Questionnaire	5	.889	.890

Note. α = Cronbach's alpha; ω = McDonald's omega.

Confirmatory Factor Analysis Results

Confirmatory factor analyses (CFA) were conducted using AMOS 24 to examine the measurement properties of the Appearance-Related Social Media Consciousness Scale and the Trainer Communication Questionnaire. Maximum likelihood estimation was employed. Model fit was assessed using multiple goodness-of-fit indices, including χ^2/df , CFI, TLI, RMSEA, and SRMR. Because the Trainer Communication Questionnaire was developed for the purposes of the present study, its CFA results were interpreted as preliminary evidence of dimensional suitability for use as a composite observed variable in the moderation model, rather than as full validation of a standalone psychometric scale.

Trainer Communication Questionnaire: A one-factor CFA model was tested to examine whether the five items of the Trainer Communication Questionnaire could be represented by a single composite dimension. The model showed very good fit indices, $\chi^2(5) = 8.436$, $p = .134$, $\chi^2/\text{df} = 1.69$, CFI = .997, TLI = .995, RMSEA = .045, and SRMR = .008. Standardized factor loadings were statistically significant and ranged from .816 to .910. Given the small number of items and the researcher-developed nature of the questionnaire, these findings should be interpreted as preliminary support for using the questionnaire as a composite observed measure in the present study, rather than as conclusive evidence of full construct validation.

Appearance-Related Social Media Consciousness Scale: A single-factor CFA model was tested for the Appearance-Related Social Media Consciousness Scale. The model yielded poor global fit indices, $\chi^2(65) = 887.327$, $p < .001$, $\chi^2/\text{df} = 13.65$, CFI = .776, TLI = .731, RMSEA = .191, and SRMR = .259. Although all standardized factor loadings were statistically significant and ranged from .623 to .894, the overall model fit did not meet

recommended criteria, suggesting that the strict single-factor model may not fully capture item-level relationships in the present sample.

Given the theoretical unidimensional structure of the scale and to avoid capitalizing on chance through data-driven modifications, no post-hoc model modifications were applied. The CFA results are reported transparently to allow readers to evaluate the psychometric performance of the scale within the current sample

Table 4 presents the CFA model fit indices, and Table 5 reports standardized factor loadings and validity coefficients.

Table 4. Confirmatory Factor Analysis Fit Indices

Scale	χ^2	df	χ^2/df	CFI	TLI	RMSEA	SRMR
Trainer Communication Questionnaire	8.436	5	1.69	.997	.995	.045	.008
Appearance-Related Social Media Consciousness Scale	887.327	65	13.65	.776	.731	.191	.259

Table 5. Standardized Factor Loadings and Composite Indices

Scale	AVE	CR	MSV	ASV	Average Load
Trainer Communication Questionnaire	.73	.93	.00	.00	0.85
Appearance-Related Social Media Consciousness Scale	.57	.89	.00	.00	0.75

Exercise addiction was not included as a latent variable in the CFA model. Although the Exercise Addiction Scale was originally developed with a three-factor structure, the present study operationalized exercise addiction using the total score because the moderation analysis focused on overall exercise addiction rather than on specific subdimensions. In addition, the scale's interpretive classification thresholds are based on total scores rather than subscale scores. Therefore, exercise addiction was treated as a composite observed variable in all subsequent analyses. This decision, including the absence of a sample-specific CFA for the Exercise Addiction Scale, is acknowledged as a measurement-related limitation in the Discussion section.

Moderation Analysis

A moderation analysis was conducted to examine whether trainer communication moderates the relationship between appearance-related social media consciousness and exercise addiction. The analysis was performed using Hayes' PROCESS macro (Version 5.0, Model 1) with heteroskedasticity-consistent standard errors (HC4). Appearance-related social media consciousness was entered as the independent variable (X), exercise addiction as the dependent variable (Y), and trainer communication as the moderator (W).

Predictor variables were mean-centered prior to analysis to facilitate interpretation of the interaction effect. The overall regression model was statistically significant, $F(3, 311) = 12.31$, $p < .001$, explaining 10.0% of the variance in exercise addiction ($R^2 = .10$).

Table 6. Moderation Analysis Predicting Exercise Addiction (PROCESS Model 1, N = 315)

Predictor	B	SE (HC4)	t	p	95% CI
Constant	3.425	.029	116.35	< .001	[3.367, 3.483]
Appearance-Related Social Media Consciousness (X)	.119	.024	4.94	< .001	[.072, .166]
Trainer Communication (W)	.161	.049	3.27	.001	[.064, .258]
X * W	-.097	.042	-2.33	.021	[-.180, -.015]

Note. PROCESS Model 1. Heteroskedasticity-consistent (HC4) standard errors were used.

Results indicated that the interaction between appearance-related social media consciousness and trainer communication was statistically significant ($\Delta R^2 = .015$, $p = .021$). This finding indicates that trainer communication moderated the relationship between appearance-related social media consciousness and exercise addiction. Specifically, the positive association between appearance-related social media consciousness and exercise addiction became weaker as perceived trainer communication increased.

Conditional Effects and Simple Slope Analysis

To further interpret the significant interaction, simple slope analyses were conducted to examine the conditional effect of appearance-related social media consciousness on exercise addiction at low (-1 SD), mean, and high ($+1$ SD) levels of trainer communication.

Table 7. Conditional Effects of Appearance-Related Social Media Consciousness on Exercise Addiction at Levels of Trainer Communication

Trainer Communication	B	SE	t	p	95% CI
Low (-1 SD)	.164	.034	4.89	< .001	[.098, .230]
Mean	.145	.028	5.12	< .001	[.089, .200]
High ($+1$ SD)	.047	.036	1.33	.184	[-.023, .117]

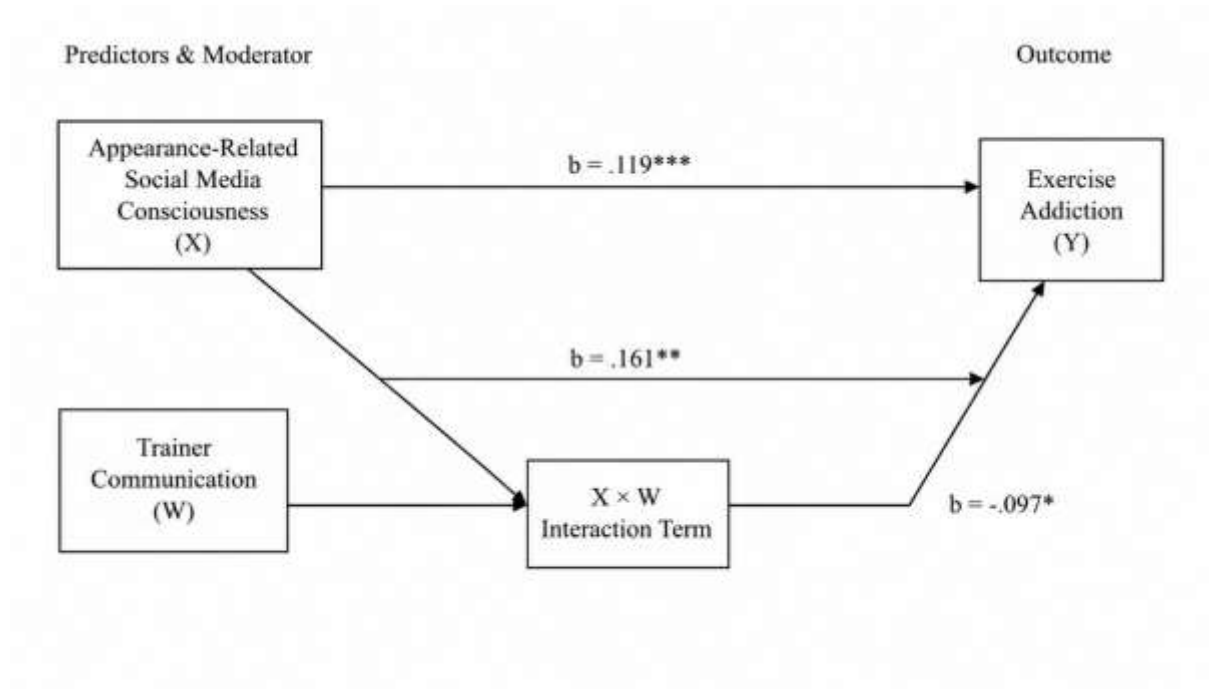


Figure 1. Moderation Model

Figure 1. Moderation model illustrates the moderating role of trainer communication in the relationship between appearance-related social media consciousness and exercise addiction. Unstandardized regression coefficients are reported. * $p < .05$, ** $p < .01$, *** $p < .001$.

Hypothesis Testing

Based on the results of the correlation and moderation analyses, the study hypotheses were evaluated as follows:

H1: Appearance-related social media consciousness is positively associated with exercise addiction. Supported. Appearance-related social media consciousness significantly predicted exercise addiction ($b = .119$, $p < .001$; Table 6).

H2: Trainer communication moderates the relationship between appearance-related social media consciousness and exercise addiction. Supported. The interaction term ($X \times W$) was statistically significant ($b = -.097$, $p = .021$), indicating that the association between appearance-related social media consciousness and exercise addiction varied as a function of trainer communication (Table 6).

H3: The positive association between appearance-related social media consciousness and exercise addiction is stronger when trainer communication is low and weaker when trainer communication is high. Partially supported. Simple slope analyses showed that the association was significant at low and mean levels of trainer communication but non-significant at high levels (+1 SD; Table 7).

Discussion and Conclusion

The present study examined the relationship between appearance-related social media consciousness and exercise addiction among adult fitness center members and tested whether trainer communication moderates this relationship. The findings showed that appearance-

related social media consciousness was positively associated with exercise addiction and that this association became weaker as perceived trainer communication increased. These results suggest that digital appearance-related processes and interpersonal communication within fitness environments may jointly relate to maladaptive exercise tendencies, although the cross-sectional design does not allow causal conclusions.

The positive association between appearance-related social media consciousness and exercise addiction is consistent with studies showing that appearance-focused social media experiences are linked to body image concerns, appearance comparisons, and maladaptive body-related behaviors (Fardouly et al., 2015; Fardouly & Vartanian, 2015; Saiphoo & Vahedi, 2019). In the context of fitness center participation, individuals who are highly attentive to appearance-related social media content may be more likely to evaluate exercise through body-oriented outcomes rather than health, enjoyment, or functional improvement. This interpretation is also consistent with research showing that exercise addiction is associated with broader image-related and psychological correlates in fitness settings (Corazza et al., 2019; Lichtenstein et al., 2014).

The Turkish context provides an important setting for interpreting this relationship. Previous Turkish research has linked exercise addiction with social appearance anxiety and related psychosocial variables, suggesting that body-related evaluation may be relevant for understanding problematic exercise tendencies in Türkiye (Doğan et al., 2022). At the same time, the modest size of the association observed in the present study indicates that appearance-related social media consciousness alone is unlikely to explain exercise addiction. Rather, the finding supports the need to consider contextual and interpersonal conditions within fitness environments that may strengthen or weaken this association.

A key finding of the present study was that trainer communication moderated the relationship between appearance-related social media consciousness and exercise addiction. The association between appearance-related social media consciousness and exercise addiction was significant when trainer communication was low or average, but it was no longer statistically significant when trainer communication was high. This pattern suggests that trainer communication may function as a contextual interpersonal condition that changes the strength of the relationship between digital appearance-related processes and maladaptive exercise tendencies.

From an SDT perspective, this finding can be interpreted through the motivational functions of supportive communication. Trainer communication that provides clear instruction, realistic feedback, encouragement, and sensitivity to individual goals may support members' perceived competence and relatedness while helping them internalize exercise goals in a more autonomous and health-oriented manner (Ntoumanis et al., 2018; Ryan & Deci, 2020; Teixeira et al., 2020). In such circumstances, members may be less dependent on appearance-based validation from social media and more able to evaluate exercise in terms of health, skill development, personal progress, and functional improvement.

Conversely, when trainer communication is perceived as weak, impersonal, or insufficiently supportive, members may have fewer interpersonal resources within the fitness environment to counterbalance appearance-focused social media messages. Under these conditions, appearance-related social media consciousness may be more strongly associated with exercise addiction because exercise may become more closely tied to external approval,

body comparison, and appearance regulation. Thus, the present findings do not demonstrate that trainer communication prevents exercise addiction; rather, they suggest that supportive trainer communication may attenuate the association between appearance-related social media consciousness and exercise addiction within recreational fitness settings.

This interpretation also helps clarify why trainer communication was examined as a moderator rather than as a direct explanatory factor. Appearance-related social media consciousness reflects a digital and cognitive orientation toward appearance-related content, whereas trainer communication reflects an interpersonal condition within the exercise environment. The significant interaction suggests that these two contexts may operate together: social media may intensify appearance-oriented exercise motives, while supportive communication within the fitness center may provide alternative meanings for exercise, such as health, competence, progress, and functional improvement. Therefore, the moderating role of trainer communication should be understood as relational and contextual rather than causal or preventive.

The measurement findings should be interpreted with appropriate caution. The Trainer Communication Questionnaire showed very good one-factor CFA fit indices and high standardized factor loadings. However, because this instrument consisted of only five researcher-developed items and was tested in a single sample, these results should not be interpreted as full validation of a standalone psychometric scale. Scale development and score validation require a rigorous process that includes item generation, content validation, pre-testing, reliability assessment, and multiple forms of validity evidence (Badenes-Ribera et al., 2020; Boateng et al., 2018). Moreover, CFA fit indices should not be interpreted in isolation, because model fit can be influenced by model complexity, sample characteristics, and the specific constraints imposed on the measurement model (Goretzko et al., 2024; Hu & Bentler, 1999). Therefore, the present findings should be viewed as preliminary support for using the questionnaire as a composite observed measure in the current moderation model rather than as robust evidence of generalizable construct validity.

Future studies should examine the Trainer Communication Questionnaire through more comprehensive psychometric procedures. In scale development studies, exploratory factor analysis is commonly used to examine the underlying item structure, whereas confirmatory factor analysis is recommended to test a hypothesized structure, ideally in an independent or cross-validation sample (Flora & Flake, 2017; Orçan, 2018). Additional evidence should also include content validity, convergent validity, discriminant validity, and criterion-related validity, because internal consistency and a single CFA model are not sufficient to establish full measurement validity (Boateng et al., 2018; Badenes-Ribera et al., 2020). Such work would help determine whether the five-item structure is stable across different fitness populations and whether the questionnaire is associated with theoretically relevant constructs such as autonomy-supportive communication, perceived competence support, relatedness, exercise motivation, and maladaptive exercise tendencies.

The Appearance-Related Social Media Consciousness Scale showed poor global CFA fit indices despite statistically significant standardized factor loadings. This pattern suggests that although the items may reflect a common appearance-related social media construct, the strict single-factor model may not fully capture item-level relationships in the present sample. In CFA, poor global fit may indicate that a hypothesized measurement structure does not adequately reproduce the observed covariance matrix, but post-hoc modifications should be

theoretically justified rather than applied only to improve fit (Flora & Flake, 2017; Goretzko et al., 2024). Therefore, no post-hoc model modifications were applied in the present study in order to avoid capitalizing on chance and to maintain transparency. Future studies should further examine the dimensional structure of the scale in different fitness and sport populations and consider alternative measurement models where theoretically justified.

Exercise addiction was operationalized using the total score of the Exercise Addiction Scale rather than as a latent multidimensional construct. This approach was consistent with the moderation-focused aim of the present study and with the scale's total-score-based interpretive classification system. Nevertheless, not conducting a sample-specific CFA for the Exercise Addiction Scale limits the extent to which the dimensional structure of exercise addiction can be evaluated in the present sample. Previous methodological work emphasizes that factor structures should be examined or replicated when instruments are used in new samples or contexts, particularly when multidimensional scales are treated as composite observed variables (Flora & Flake, 2017; Orçan, 2018). Future research should test the original three-factor structure of the Exercise Addiction Scale and examine whether the moderating role of trainer communication differs across specific dimensions of exercise addiction.

Theoretically, the findings support an integrative perspective in which appearance-related social media processes are considered together with motivational and interpersonal factors. Appearance-related social media consciousness was associated with exercise addiction, but this association differed according to perceived trainer communication. This pattern is consistent with SDT-based explanations suggesting that interpersonal contexts can shape the quality of exercise motivation by supporting or frustrating autonomy, competence, and relatedness needs (Ryan & Deci, 2020; Teixeira et al., 2020). It also aligns with research emphasizing that social comparison and appearance-based evaluation are important mechanisms through which social media may relate to body image concerns and maladaptive body-related behaviors (Fardouly & Vartanian, 2015; Perloff, 2014; Saiphoo & Vahedi, 2019).

In this respect, the present findings suggest that maladaptive exercise tendencies should not be interpreted only as individual responses to appearance-focused social media content. Rather, they should also be considered in relation to the social environment in which exercise behavior takes place. Trainer communication may provide members with alternative meanings for exercise by emphasizing health, functional improvement, skill development, and realistic progress instead of appearance comparison alone. This interpretation is consistent with SDT-based work highlighting the importance of autonomy-supportive and competence-supportive communication in exercise and sport contexts (Ntoumanis et al., 2018; Ryan & Deci, 2020; Teixeira et al., 2020).

From a practical perspective, the results point to the potential value of communication training for fitness professionals. Such training should not be framed as a direct prevention strategy for exercise addiction, because the present cross-sectional findings do not support causal conclusions. Instead, the findings suggest that supportive trainer communication may be one contextual factor associated with a weaker relationship between appearance-related social media consciousness and exercise addiction. Practical communication strategies may include providing clear exercise instruction, offering realistic and individualized feedback, avoiding appearance-focused pressure, reinforcing health-oriented goals, and encouraging

members to evaluate progress through competence, well-being, and functional improvement rather than body comparison alone (Ntoumanis et al., 2018; Teixeira et al., 2020).

Several limitations should be acknowledged. First, the cross-sectional and correlational design of the study does not allow causal conclusions. Although the moderation model showed that the association between appearance-related social media consciousness and exercise addiction varied according to trainer communication, the direction and temporal ordering of these variables cannot be determined from the present data. Future longitudinal and experimental studies are needed to examine whether appearance-related social media consciousness predicts later changes in exercise addiction tendencies and whether communication-focused interventions can alter this association over time (Hayes, 2018).

Second, the study relied on self-report measures, which may increase the risk of common method bias, social desirability effects, and shared measurement variance. Although self-report questionnaires are appropriate for assessing subjective perceptions such as appearance-related social media consciousness and perceived trainer communication, responses may still be influenced by participants' recall accuracy, self-presentation tendencies, and interpretation of scale items. Future research could reduce these limitations by combining self-report data with behavioral indicators, trainer reports, observational assessments, or longitudinal diary methods (Podsakoff et al., 2003).

Third, the study was quantitative in design, which limits the extent to which participants' lived experiences, meanings, and interpretations can be understood in depth. In particular, the present data do not explain why participants use social media, which platforms they use most frequently, what types of fitness or appearance-related content they encounter, or how they interpret such content in relation to their own exercise goals. Qualitative interviews, focus groups, or mixed-methods designs could provide richer information about social media use motives, platform-specific habits, exposure to fitspiration content, and the personal meanings attached to trainer communication in fitness environments. Such approaches are especially relevant because qualitative and mixed-methods social media research commonly uses interviews, focus groups, surveys, and content analysis to understand how and why individuals use social media and how they experience it (Brennan et al., 2023; Snelson, 2016).

Fourth, several measurement-related limitations should be considered. The Trainer Communication Questionnaire was developed for the purposes of the present study and should therefore be interpreted as a brief context-specific measure rather than as a fully validated psychometric scale. Although its internal consistency and one-factor CFA results were acceptable for use as a composite observed variable in the present moderation model, further validation is required through content validity assessment, independent exploratory and confirmatory factor analyses, cross-validation, and criterion-related validity testing (Badenes-Ribera et al., 2020; Boateng et al., 2018). In addition, the Appearance-Related Social Media Consciousness Scale showed poor global CFA fit indices in the present sample, and the Exercise Addiction Scale was used as a total observed score without testing its original three-factor structure. Future studies should examine whether the proposed moderation effect differs across specific dimensions of exercise addiction and across alternative measurement models.

Finally, the sample consisted of adult members of paid sports and fitness centers located in Ankara and Kırıkkale, Türkiye, and participants were recruited using convenience sampling. Therefore, the findings may not generalize to other exercise populations, non-membership-based physical activity settings, competitive athletes, adolescents, or individuals who exercise outside commercial fitness environments. Future studies should use more diverse and representative samples, compare different types of exercise settings, and examine additional contextual variables such as trainer certification, frequency of trainer interaction, social media use intensity, type of followed fitness content, and members' primary exercise motives.

In conclusion, the present study suggests that appearance-related social media consciousness is positively associated with exercise addiction among adult fitness center members and that this association varies according to perceived trainer communication. The positive association was stronger when trainer communication was low and became non-significant when trainer communication was high. These findings indicate that supportive trainer communication may serve as a contextual interpersonal factor that attenuates the relationship between digital appearance-related processes and maladaptive exercise tendencies. However, given the cross-sectional design and the use of a researcher-developed communication questionnaire, the findings should be interpreted as associational rather than causal. Strengthening supportive, health-oriented, and non-appearance-focused communication practices among trainers may contribute to healthier exercise engagement in recreational fitness settings.

**This article was produced from the author's master's thesis and was previously presented at the 6th International Recreation and Sports Management Congress held on 10–13 April 2025, Antalya, TÜRKİYE. The findings reported in the present manuscript are based on empirical data collected after obtaining ethics committee approval.*

Author Contributions

MU and BSN contributed to the conceptualization, methodology, and investigation of the study. MU conducted the formal analysis and prepared the original draft of the manuscript. MU and BSN contributed to the review and editing of the manuscript. Both authors have read and approved the final version of the manuscript.

Availability of Data and Materials

The dataset generated and analyzed during the current study is available from the corresponding author upon reasonable request.

Declarations

Use of AI in Manuscript Preparation

During the preparation of this manuscript, the authors used artificial intelligence (AI)-based language tools to support language editing, translation, and improvement of textual clarity. Following the use of these tools, the authors critically reviewed and revised all content and assume full responsibility for the accuracy, integrity, and originality of the manuscript.

Competing Interests

The authors declare that they have no competing interests.

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