




Adaptation of the QAD-Fit Scale for Measuring Doping Attitudes in Fitness into Turkish: A Validity and Reliability Study

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Abstract

In recent years, doping behavior has expanded beyond professional sports and become increasingly visible in fitness and recreational contexts. Given the absence of a relevant measurement tool in Turkish, this study aimed to adapt “the Questionnaire of Attitudes towards Doping in Fitness (QAD-Fit)” into Turkish culture and provide a valid instrument for the field. The QAD-Fit, developed to assess attitudes toward doping in fitness settings, consists of 16 items across four subscales (attitudes, subjective norms, beliefs, and intentions) rated on a seven-point Likert scale. The sample included 337 individuals (124 females, 213 males; $M = 24.31$, $SD = 6.998$) who engage in fitness activities. Following linguistic validation, exploratory and confirmatory factor analyses were conducted to examine construct validity. Exploratory factor analysis results revealed a three-factor structure explaining 62.86% of the total variance (42.04%, 12.64%, and 8.18%, respectively). During confirmatory factor analysis, high-covariance residuals were added to improve model fit, and item 5 was removed. The revised model demonstrated acceptable fit indices. The Cronbach’s Alpha coefficient was found to be .88, while the internal consistency coefficients of the subscales ranged between .60 and .93. Additionally, the test-retest correlation conducted with a 25-day interval was determined to be .81. In conclusion, the Turkish adaptation of the QAD-Fit scale can be considered a psychometrically valid and reliable tool for assessing attitudes toward doping behavior among individuals in a fitness environment.

Keywords: Doping in fitness, Scale adaptation, Construct validity, Reliability

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INTRODUCTION

Doping is known to be used not only among professional athletes today, but also among individuals who engage in recreational sports, those who attend fitness centers, and individuals who exercise for aesthetic reasons (Bojsen-Møller & Christiansen, 2010; Tavares et al., 2022). This situation demonstrates that doping is not solely about enhancing athletic performance; rather, it encompasses a range of motivations, including physical appearance, social acceptance, and personal satisfaction (Backhouse et al., 2013; Sagoe et al., 2014). The global prevalence of doping substance use in fitness centers has been documented to range from 6.4% to 29.3% (Hamid et al., 2025).

In Turkey, there has been an increasing tendency among individuals who exercise to resort to doping methods (Ulusoy & Özer, 2021). The widespread use of anabolic androgenic steroids (AAS) outside of professional sports has become a significant problem threatening public health (Pope et al., 2014). This is due to the serious side effects of doping substances or methods on health. In this context, it is important to acknowledge that doping in fitness and recreational sports environments is not merely an individual choice, but a multifaceted phenomenon shaped by social and cultural dynamics (Johnson, 2012; Ömercioğlu & Erman, 2025). The paucity of studies conducted in Turkey on the use of doping substances or methods in recreational sports environments underscores the necessity for more in-depth research, particularly regarding the attitudes, motivations, and reasons of the individuals involved. Furthermore, there is a need for validated and reliable measurement tools to understand individual perceptions and attitudes towards doping. It is hypothesized that developing novel scales or adapting existing scales in this field will address this gap in the literature.

A few psychometric measurement tools that have been adapted into Turkish are available in the literature for determining attitudes towards doping use in professional sports environments (Gürpınar et al., 2019; Yıldız & Toros, 2018). However, the primary focus of these measurement tools is on perceptions and attitudes regarding professional sports and the use of performance-enhancing substances in this context. This creates a gap, as these scales are not adequately suited to measure the unique attitudes, motivations, and risk perceptions of individuals who participate in recreational bodybuilding and exercise for aesthetic reasons toward AAS and other doping substances (such as peptide hormones). Accordingly, fitness and recreational usage environments have a culture that is less regulated, self-managed, and generally focused on aesthetic goals, unlike regulations aimed at combating doping in professional sports (Christiansen, 2020; Van de Ven et al., 2022).

The QAD-Fit scale is based on the Theory of Planned Behavior (TPB) (Serpa et al., 2001; Tavares et al., 2019). TPB, considered one of the most comprehensive theories in social psychology literature for predicting behavior, argues that behavior is the result of a multidimensional intention shaped not only by personal attitudes but also by subjective norms and perceived control (Ajzen, 1991, 2001, 2002; Armitage & Conner, 2001). The theory's fundamental assumption is that individuals approach decision-making processes rationally. In this context, individuals form their action intentions by systematically evaluating their beliefs about the behavior, their social expectations, and their capabilities (Ajzen, 1991; Ajzen &

Madden, 1986). According to TPB, three key components shape intention and, consequently, doping behavior: Attitudes, subjective norms, and perceived behavioral control. Attitude is the way an individual evaluates doping behavior positively or negatively (Ajzen, 2001). If an athlete believes that doping will lead to desired outcomes such as performance enhancement or absolute success, their attitude toward doping strengthens in proportion to the value they place on these outcomes (Lucidi et al., 2008; Serpa et al., 2001; Tavares et al., 2019). Therefore, measuring attitudes in research is important for understanding individuals' behavioral tendencies (DeVellis & Thorpe, 2021).

Subjective norms refer to an individual's perception of the extent to which their immediate social environment (family, coach, peer group, or professional environment) approves of doping behavior. If an athlete perceives normative pressure or approval from their environment, this can significantly trigger their intention to engage in doping (Ntoumanis et al., 2014). Perceived behavioral control, on the other hand, is an individual's perception of their self-efficacy to perform the action (Ajzen, 1991). In the context of doping, this is shaped by beliefs about the ease of access to banned substances, confidence in not getting caught, and the ability to manage the process (Ajzen, 1991), and these beliefs positively influence the intention to dope (Zelli et al., 2010). Ajzen (1991) argues that the strongest predictor of behavior is intention, which is formed by the combined effects of these three components. As the level of intention increases, so does the likelihood that doping behavior will occur. In conclusion, TPB provides a strong theoretical foundation for interpreting complex decision-making processes, particularly in health and sports science (Ajzen & Driver, 1991).

In this context, it is considered necessary to develop new or adapted measurement tools with psychometric properties specifically tested for fitness users. The main objective of this study is to adapt the "Questionnaire of Attitudes towards Doping in Fitness (QAD-Fit)" scale, psychometrically evaluated by Tavares et al. (2019), into Turkish, conduct validity and reliability analyses, and thus provide a qualified measurement tool for fitness doping to the Turkish literature.

METHOD

Research Model

This research, designed within a quantitative methods framework, is a scale adaptation study. It aims to provide evidence of a measurement tool's validity and reliability. In this context, studies by Beaton et al. (2000) and Karaçam (2019) on cross-cultural scale adaptation served as guides.

Research Groups

The study's sample group was selected using a purposive sampling method, with voluntary participation. The total number of participants was 337 ($M = 24.31$, $SD = 6.998$), including 124 women and 213 men with experience of fitness exercise. Table 1 contains the socio-demographic information for the participants.

Table 1. Socio-demographic information

Variables	<i>N</i>	<i>M</i>	<i>SD</i>	(%)
Age	337	24.31	6.998	
Female	124			36.8
Male	213			63.2
<i>Exercise Duration</i>				
< 6 months	85			25.2
6 – 12 months	62			18.4
1–3 year	82			24.3
3–5 year	42			12.5
> 5 years	66			19.6

In the extant literature, the consensus is that a sample size of 150–200 participants is adequate for exploratory factor analysis (EFA), while a sample size of 300 or more is considered substantial (Tabachnick & Fidell, 2007). For confirmatory factor analysis (CFA) and structural equation modeling, a minimum of 200 participants is recommended, with a sample size of 300–500 suggested for more robust models (Kline, 2016). Within this theoretical framework, the sample of 337 participants included in the study meets the critical thresholds and adequacy criteria outlined in the literature for factor-analytic applications. Furthermore, a post hoc power analysis (G*Power) was conducted to verify the representativeness and statistical power of the sample. The analysis revealed that the study's statistical power was .969 at a 95% confidence level ($\alpha = .05$). This value confirms that the sample group ($N=337$) is statistically sufficient in terms of the reliability of the analysis results and its representativeness of the population (Faul et al., 2009).

Data Collection Tools

In this study, “the Demographic Information Form” and “the Questionnaire of Attitudes towards Doping in Fitness (QAD-Fit)” scale were utilized as data collection tools. The demographic information form comprises 4 questions covering age, gender, and fitness history. The initial version of the QAD-Fit scale was developed by Serpa et al. (2001) and consists of

34 items and four subscales. The subscales considered are as follows: (1) The Attitudes subscale measures attitudes toward the use of doping substances. (2) Subjective norms are defined as the perceptions of significant others regarding the use of doping substances. (3) Beliefs refer to the thoughts and expectations regarding the performance-enhancing effects of doping substances on athletes. (4) Intentions reflect the extent to which individuals perceive themselves as inclined to use performance-enhancing substance. Subsequent psychometric analyses conducted by Tavares et al. (2019) resulted in the scale being revised and reduced to 16 items. The QAD-Fit is a seven-point Likert-type scale ranging from (1) strongly disagree to (7) strongly agree. Items 5, 13, 25, 30, and 32 in the original form should be reversed. A high score on the scale indicates a more positive attitude towards the consumption of performance-enhancing substances. The CFA fit index results suggest that the scale is acceptable ($\chi^2 = 204.383$, BS $p < .03$; $\chi^2/df = 2.107$, PCFI = .79, PGFI = .67, CFI = .98, RMSEA = .049). The composite reliability values range from .74 (beliefs) to .97 (intentions). It is important to note that no English version of the QAD-Fit scale is available. It is evident that the scale has undergone adaptation from its original Portuguese form. This adaptation has been undertaken in accordance with established principles of linguistic and cultural adaptation.

Ethics Approval

Prior to the commencement of the research, the responsible author of the scale, Ana Tavares, was contacted via email, and permission was obtained to adapt the scale into Turkish and use it in other planned studies. In the next stage, the Burdur Mehmet Akif Ersoy University Non-Interventional Clinical Research Ethics Committee granted the necessary ethical permissions (Meeting: 2025/3, Decision No: GO 2025/1413). Furthermore, the study was conducted in accordance with the Declaration of Helsinki, and signed consent forms were obtained from the participants.

Collection of Data

The linguistic adaptation process was completed before the collection of research data. During the translation and back-translation stages, two independent linguists first translated the text from Portuguese into Turkish. The initial two translations of the scale were subsequently consolidated into a unified version, a process informed by the insights of sports science and measurement and evaluation specialists. Consequently, content validity was assured through the incorporation of expert opinions from within the field. The translation from Turkish into Portuguese was then performed by a third linguist. The consistency between the original version of the scale and the back-translated version from Turkish into Portuguese was evaluated by a fourth linguist, and sufficient consistency was found.

A pilot study was conducted with 30 participants (26 male, 4 female) to assess the linguistic clarity of the Turkish scale. Due to the challenges encountered in identifying fitness practitioners proficient in both languages for this pilot study, the decision was made to include only native Turkish speakers. Following the pilot study, the scale was re-administered to the same group of participants after an average of 25 days to assess test-retest reliability. The Cronbach's Alpha internal consistency coefficient was .78 in the pre-test and .81 in the post-test. The findings suggest that the scale demonstrates high internal consistency at both time

points. In addition, the test-retest reliability of the scale was determined by calculating a Pearson correlation between the total scores from the pre-test and post-test. The analysis revealed a strong, positive, and statistically significant relationship between the two measurements ($r = .815, p < .001, n = 30$). Furthermore, the analysis of verbal and written feedback obtained from participants indicated that the scale items were clear and comprehensible. The final Turkish version of the scale, obtained after the pilot application, was named the “Fitnessta Dopinge Yönelik Tutum Ölçeği (FDYTÖ)” and was administered both face-to-face and digitally.

Analysis of Data

The concept of validity in research is defined as the extent to which the research aligns with its stated purpose and the accuracy with which the measurement tools employed to assess the targeted concepts correspond with the intended meaning (Bryman, 2016). Reliability is defined as the consistency and repeatability of a measurement tool. Cohen et al. (2002) posits that, if a data collection tool exhibits high reliability, it is to be expected that similar results will be obtained when the tool is employed on multiple occasions under identical conditions. Prior to conducting the structural validation analyses, a multi-stage data screening process was performed on the initial 396 responses to ensure compliance with the assumptions of Multivariate Analysis. First, the dataset was examined for missing values, incomplete entries, and unengaged response patterns (e.g., straight-lining where a participant selects the same rating for all items). After excluding invalid cases and extreme outliers based on standard z-score thresholds (± 2.5), the final dataset was reduced to 337 structurally robust cases. Following this data purification, Exploratory Factor Analysis (EFA) was employed to ascertain the underlying factor structure of the scale. Subsequently, Confirmatory Factor Analysis (CFA) was implemented via AMOS to verify and confirm the goodness-of-fit values of the obtained multi-factor model. Furthermore, sociodemographic data were analyzed using descriptive statistics. A Pearson correlation analysis was performed to assess the direction and strength of the relationship between the scales. Additionally, Spearman-Brown was used to measure split-half reliability, where items on a scale are divided into two separate halves, and the correlation between these two groups is calculated. The data were analyzed using the SPSS program.

FINDINGS

To examine the construct validity of the FDYTÖ, EFA was first administered. Prior to the analysis, the Kaiser-Meyer-Olkin (KMO) test was conducted to assess the adequacy of the sample size for factor analysis. The KMO and Bartlett tests yielded $KMO = .912$, $\chi^2 = 2864.543$, $df = 120$, $p < .001$. The Maximum Likelihood (ML) method was utilized as the inference technique in the EFA conducted to ascertain the factor structure of the scale. The rationale for this methodological preference is that it ensures parameter estimates are more robust and generalizable when the assumption of multivariate normality is met (Jöreskog, 1967). The rotation method employed was Oblimin with Kaiser Normalization, which was utilized to assess the anticipated structural relationships between the factors.

Table 2. Attitude scale toward doping in fitness EFA

Items	F1	F2	F3	Dimension Reliability	Scale Reliability
Item 6	.888				
Item 14	.874				
Item 7	.863				
Item 16	.855				
Item 9	.763			.932	
Item 4	.744				
Item 10	.681				
Item 1	.507				
Item 13		.788			.881
Item 11		.735			
Item 3		.672		.800	
Item 2		.588			
Item 15		.511			
Item 12			.633		
Item 8			.627	.623	
Item 5			.466		
Explained Variance:	42.035%	12.644%	8.179%	Total: 62.858%	
KMO: .912	$\chi^2:2864.543$		df:120		$p < .001$

The results of the EFA are presented in Table 2. Upon rigorous examination of the KMO coefficient and the results of the Bartlett's sphericity test, it is determined that the scale is indeed suitable for factor analysis. Consequently, following the analysis, item 5 was eliminated from the scale due to its low factor loading, thereby weakening the overall fit of the model. The relevant item demonstrated a low factor loading (.466) under the third factor.

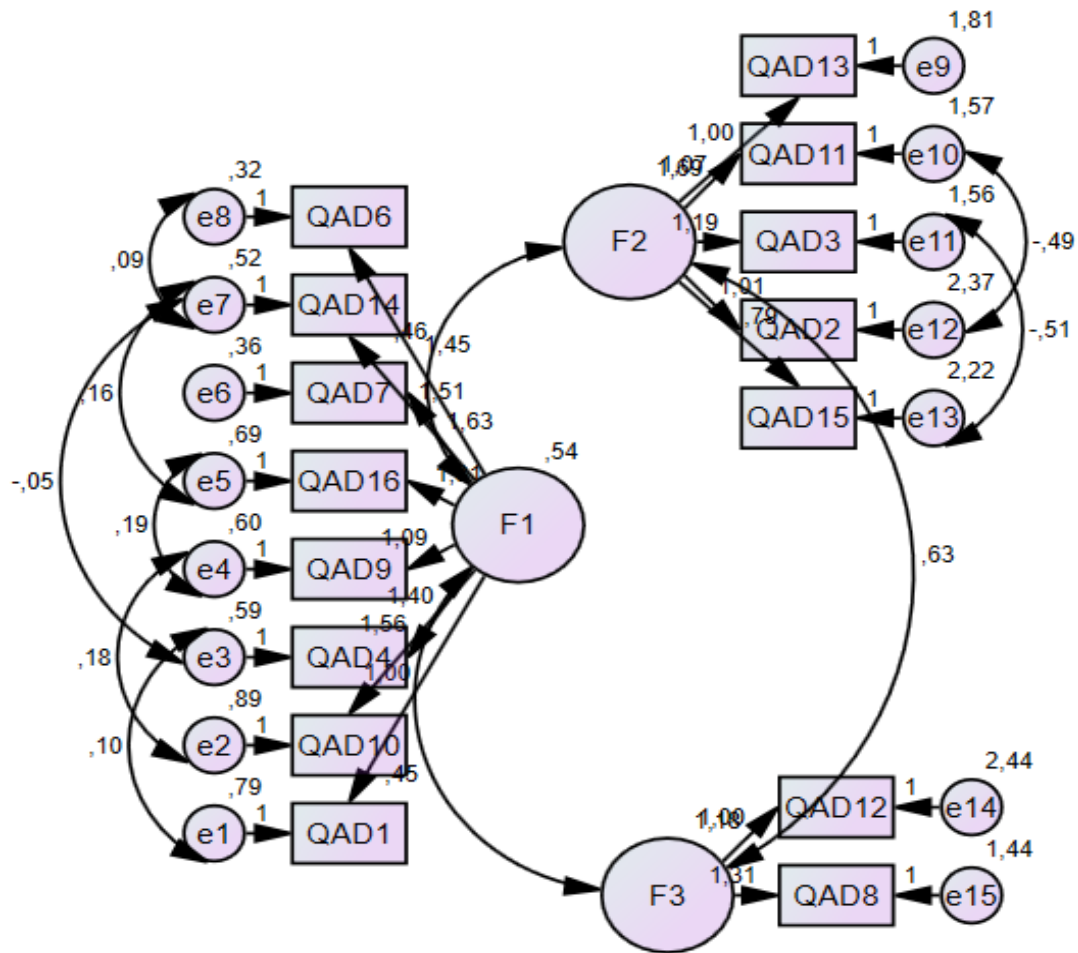


Figure 1. Multifactorial model of the attitude scale towards doping in fitness

The ML method was utilized as the CFA parameter estimation technique to evaluate the three-factor structure obtained with EFA. The ML method was utilized because it represents the standard and most robust estimation technique for confirmatory analyses based on covariance. During the model improvement process in CFA, modifications were made among the error terms with high covariance. Additionally, item 5, which reduced the model fit indices, was structurally removed from the model. These error modifications were strictly restricted to indicators within the same latent construct that exhibited high modification indices, capturing shared specific variance potentially stemming from similar semantic phrasing or sentence structures among those items. As illustrated in Figure 1, the standardized coefficients and error variances associated with the CFA for the three-factor confirmed structure of the FDYTÖ are presented.

Table 3. Results related to the multi-factor model of the attitude scale towards doping in fitness

Factors	Items	Factor Loading	SE	t
Factor 1 (Intentions and Subjective Norm)	1	.636		
	10	.771	.130	11.949*
	4	.799	.106	13.192*
	9	.716	.096	11.265*
	16	.757	.112	11.768*
	7	.894	.123	13.296*
	14	.837	.120	12.609*
Factor 2 (Attitudes)	6	.882	.110	13.154*
	13	.695		
	11	.742	.091	11.692*
	3	.779	.098	12.195*
	2	.650	.098	10.334*
Factor 3 (Beliefs)	15	.569	.087	9.082*
	12	.571		
	8	.764	.204	6.413*

* $p < .01$

As illustrated in Table 3, the subsequent findings are related to the multi-factor model of FDYTÖ. Upon examination of the correlations between variables, it is evident that the item factor loadings exceed .30, and all correlations are statistically significant.

Table 4. The following report presents the goodness-of-fit values of the structural model

	Structural Model Values	Good Fit	Acceptable Fit
χ^2/df	1.389	≤ 3	$\leq 4-5$
RMSEA	.034	$\leq .05$	$\leq .06-.10$
CFI	.989	$\geq .95$	$\geq .85-.94$
IFI	.989	$\geq .95$	$\geq .85-.94$
TLI	.985	$\geq .95$	$\geq .85-.94$
NFI	.961	$\geq .95$	$\geq .85-.94$
GFI	.959	$\geq .90$	$\geq .85-.89$
SRMR	.093	$\leq .05$	$\leq .06-.10$
$\chi^2 = 109.727; df = 79; p = .013$			

Table 4 presents the goodness-of-fit values for the structural model. According to CFA, the structural equation model results for the scale were significant at $p < .01$, and the 15 items comprising the scale were determined to be related to the 3-factor scale structure (Table 3).

Table 5. Normality assumption and reliability analysis

Scale	n	M	SD	Kolmogorov Smirnov (p)	Skewness	Kurtosis	Cronbach's Alpha
Intentions and Subjective Norms	337	14.31	8.401	.000	1.400	.954	.932
Attitudes	337	13.42	7.149	.000	.738	-.190	.800
Beliefs	337	6.14	3.191	.000	.276	-.909	.607
FDYTÖ	337	33.87	14.918	.000	.672	-.531	.881

* $p < .001$

The Cronbach Alpha coefficient for the scale's subscales ranged from .60 to .93. This finding suggests that the scale's subscales possess an adequate degree of reliability.

Table 6. Correlation analysis

Correlation (r values)	Intentions and Subjective Norms	Attitudes	Beliefs
Attitudes	.438*		
Beliefs	.429*	.329*	
FDYTÖ Total Score	.865*	.796*	.614*

* $p < .01$

The results of the correlation analysis are presented in Table 6. The analysis revealed that the intentions and subjective norms construct shared a positive, moderately significant relationship with attitudes ($r = .438, p < .01$), and a similar significant association with beliefs ($r = .429, p < .01$). In contrast, the positive relationship between attitudes and beliefs emerged as significant but weak ($r = .329, p < .01$). Notably, FDYTÖ Total Score displayed strong and robust positive correlations across all variables; it was highly correlated with intentions and subjective norms ($r = .865, p < .01$), substantially linked with attitudes ($r = .796, p < .01$), and showed a reliable, strong positive relationship with beliefs ($r = .614, p < .01$).

DISCUSSION and CONCLUSION

The objective of this study is twofold: first, to adapt the QAD-Fit scale, psychometrically tested by Tavares et al. (2019), to the Turkish language and culture; and second, to contribute a qualified measurement tool for fitness doping to the literature. In conclusion, the adaptation of the original Portuguese scale to Turkish was completed, and the final Turkish version was found to be consistent with the original. In a pilot study with 30 participants, the QAD-Fit items were found to be comprehensible and intelligible, as indicated by both written and verbal responses. This finding further supports the hypothesis that the translation and back-translation processes successfully achieved linguistic equivalence and that these items did not undergo any meaning shifts specific to Turkish culture. Following the administration of the FDYTÖ to 337 individuals, validity and reliability analyses of the scale were conducted.

Prior to the execution of EFA, the KMO and Bartlett tests were conducted to evaluate the appropriateness of the sample size for factorization, yielding $KMO = .912, \chi^2 = 2864.543, df = 120, p < .001$. The KMO coefficient is a measure of the suitability of the data matrix for factor analysis, with the prevailing opinion in the relevant literature being that this value should exceed .60 for factorizability (Büyüköztürk, 2009). In consequence of EFA, it was ascertained that the items formed a structure consisting of three factors explaining 62.86% of the total variance, with the first factor explaining 42.04% of the total variance, the second factor

explaining 12.64% of the total variance, and the third factor explaining 8.18% of the total variance. Consequently, items 6, 14, 7, 16, 9, 4, 10, and 1 were grouped under the first factor, items 13, 11, 3, 2, and 15 were grouped under the second factor, and items 12, 8, and 5 were grouped under the third factor. When examining the scale's total score using reliability analyses applied to the three-factor structure and total score, it is understood that the Cronbach's Alpha values are at an adequate level (Kalaycı, 2006).

The CFA was performed to ascertain the validation of the three-factor structure of the scale for individuals who exercise. According to the CFA, the structural equation model of the scale was significant at $p < .01$, and the 15 items comprising the scale supported the three-factor structure (see Table 3). During model refinement, variables that reduced fit were identified, and novel covariances were formulated for those exhibiting elevated residual covariance. The findings obtained regarding the construct validity of the scale demonstrated that the beliefs subscale was represented by two items, in contrast to its original form (three items). During the analysis, the removal of Item 5 from the structure was considered necessary to achieve acceptable levels of fit indices (Aksu et al., 2017; Meydan & Şeşen, 2015). According to Kline (2016), the removal of an item is permissible if the resultant increase in the total reliability coefficient of the scale or sub-dimension is significant. This is because such an item disrupts internal consistency. Whilst traditional scale development approaches recommend that a factor be represented by a minimum of three items (Tabachnick & Fidell, 2007), the extant literature posits that two-item subscales can be retained if they represent a conceptually unique structure and the correlation between items is strong (Eisinga et al., 2013; Yong & Pearce, 2013). Indeed, the results of this study demonstrated that two items encompass the theoretical essence of the belief phenomenon. Furthermore, the reliability level confirmed by the Spearman-Brown coefficient was deemed to be sufficient for a two-item structure (.61) (Baykul, 2015). The utilisation of measurement tools that yield statistically significant results with a limited number of items is a prevalent practice within the extant literature (Atak, 2013; Gosling et al., 2003). This finding suggests that the Turkish version of the scale is both economically viable and psychometrically sound.

The findings of this study corroborate the prevalent psychometric adequacy observed in adaptations of the QAD-Fit scale across diverse cultural contexts. Furthermore, the study reveals substantial structural disparities, highlighting significant cultural nuances. While Tavares et al. (2019) confirmed the four-factor structure of the scale in their original study, reporting strong internal consistency and good model fit, in a similar vein, the Persian adaptation of QAD-Fit (Ghanbari et al., 2023) retained the 16-item, four-factor structure of the scale. In the Turkish adaptation, intentions and subjective norms were combined into a single factor, resulting in a three-factor structure. This combination suggests that, in the context of the TPB, social norms and behavioral intentions may be more closely integrated in Turkish culture. In the cultural psychology literature, Turkey is characterized as a society with high interpersonal interdependence, a strong leaning toward collectivist traits, and a culture of relatedness (Kağıtçıbaşı, 2017). Viewed through the lens of the Theory of Planned Behavior, behavioral decisions and intentions of individuals in collectivist societies cannot be considered in isolation from the social norms and expectations of their in-group, such as coaches or peers in a fitness environment (Feng et al., 2023). Because individuals in these societies are more

inclined to conform to group expectations and social authority, their actions are shaped by subjective norms rather than individual attitudes (Du et al., 2026; Feng et al., 2023). Consequently, personal intentions regarding doping use are organically intertwined with perceived social pressure, encouragement, or acceptance (subjective norms) from the environment. Unlike individualistic cultures where personal decisions are demarcated more clearly from environmental factors, as seen in the Western/European contexts where the original scale was developed, the conceptual convergence of intention and social approval into a unified construct among Turkish fitness participants emerges as a natural outcome of this cultural integration. Despite the structural differences from the original scale, the Turkish form demonstrates a high total variance explained (62.86%), and the model fit indices ($\chi^2/df = 1.389$, RMSEA = .034) are superior to those in the original study ($\chi^2/df \approx 2.10$, RMSEA $\approx .049$).

The reliability of the scale's subscales was found to be high (see Table 5). According to Kalaycı (2006), a Cronbach's Alpha coefficient ranging from .60 to .80 is indicative of moderate reliability, whereas a coefficient between .80 and 1 signifies high reliability. According to Özdamar (2004), the reliability of a scale based on the Cronbach's Alpha coefficient is classified as follows: unreliable if the alpha is less than or equal to .00, of low reliability between .00 and .40, of moderate reliability between .40 and .60, of high reliability between .60 and .80, and of very high reliability if it is greater than .80. The findings indicate an alpha of .88 for the total scale and .60 to .93 for specific factors. Notably, the combined Intentions-Subjective Norms factor demonstrated exceptionally high internal consistency with an alpha of .93, which is consistent with the robust correlations observed in the correlation analyses (e.g., $r = .865$ with the total FDYTÖ score). Conversely, the comparatively lower reliability ($\alpha \approx .60$) observed in the Beliefs factor can be attributed to the diminished number of items in this subscale or cultural variations. Contextually, measuring beliefs regarding an illicit and heavily stigmatized phenomenon like doping introduces a prominent social desirability bias (Ntoumanis et al., 2014). Participants in fitness settings frequently experience cognitive dissonance when reporting their true cognitive beliefs about the efficacy or utility of doping substances and methods, leading to restricted variance or inconsistent response behaviors across sensitive items. Similar fluctuations in the reliability of belief-based domains have been documented in the anti-doping literature (Backhouse et al., 2013). Furthermore, it is critical to note that the 'Belief' subscale in the original instrument already possessed a limited framework consisting of only three items. Given that this research is a cross-cultural adaptation study, preserving the conceptual boundaries of the original scale while losing one item (Item 5) due to psychometric necessities inevitably compounded this limitation. This structural constraint underscores that adapting inherently short subscales across cultures leaves a narrow margin for structural optimization.

Pearson correlation analysis results indicate that positive and significant relationships between variables are predominant (Obilor & Amadi, 2018). The analysis revealed a moderate positive relationship between intentions and subjective norms with attitudes ($r = .438$, $p < .01$) and beliefs ($r = .429$, $p < .01$). The findings of this study demonstrate a persistent correlation between intentions and subjective norms with other fundamental constructs. The strongest correlation was identified between intentions, subjective norms, and FDYTÖ at a very strong

level ($r = .865, p < .01$), thereby emphasizing the pivotal role of intentions and norms in shaping FDYTÖ. Conversely, while the relationship between attitudes and beliefs remained weak ($r = .329, p < .01$), the relationships between attitudes and FDYTÖ ($r = .796, p < .01$) and between beliefs and FDYTÖ ($r = .614, p < .01$) were determined to be strong and positive. The uniformity of the correlations indicates a positive relationship between the variables, suggesting that an increase in one variable will be accompanied by an increase in the other (Obilor & Amadi, 2018).

In conclusion, the FDYTÖ can be considered a valid and reliable tool for researchers seeking to assess attitudes towards the consumption of doping substances in fitness settings (see Table 5). Consequently, it has been demonstrated to address a significant gap in the extant literature by offering a measurement tool that possesses adequate psychometric properties. Moreover, the present study facilitates international comparative research examining attitudes towards doping in exercise settings.

Practical Implications

The Turkish adaptation of the Questionnaire of Attitudes towards Doping in Fitness (FDYTÖ) carries significant practical utility across various domains within sports sciences, public health, and anti-doping policy management. The scale is specifically tailored for individuals participating in recreational fitness and gym exercises, rather than professional athletes. It provides a psychometrically validated, cost-effective screening tool for sports organizations, public health researchers, gym managers, and anti-doping institutions to map out the sociocultural climate, risk profiles, and the normalization of performance-enhancing substances within the aesthetics-driven fitness sector. Furthermore, this instrument enables robust cross-cultural comparative analyses with international data.

FDYTÖ consists of evaluating behavioral tendencies by measuring three interrelated dimensions: Intentions and Subjective Norms, Attitudes, and Beliefs. The scale utilizes a 7-point Likert system (ranging from 1 = strongly disagree to 7 = strongly agree) across its 15 items and three factors: Intentions and Subjective Norms (8 items: 1, 4, 5, 6, 8, 9, 13, 15), Attitudes (5 items: 2, 3, 10, 12, 14), and Beliefs (2 items: 7, 11). Items 2, 3, 10, 12, and 14 should be reverse-coded to ensure data consistency.

However, as an adaptation study, it is subject to certain limitations. The present study is constrained to the analysis of the adapted scale items (16 items) and the data obtained from individuals participating in fitness exercise. Moreover, the findings are limited to the validity and reliability levels achieved during the adaptation of the QAD-Fit Scale into Turkish. The present study found that the available evidence did not allow for determining the occurrence of doping behavior among individuals with positive attitudes. Lastly, practitioners and researchers should interpret higher total or subscale scores as a generalized propensity or latent vulnerability toward doping behavior driven by peer norms and aesthetic goals, rather than individual proof of substance use. Individual-level diagnostic decisions should not be derived solely from this self-report measure. Although this study addresses a significant gap by providing an instrument to measure doping attitudes in recreational fitness environments, it

possesses inherent methodological limitations due to its nature as a cross-cultural adaptation study. Accordingly, future research initiatives are recommended to develop an indigenous measurement tool tailored to the unique sociocultural structure of Turkish culture and to employ mixed-methods approaches to further deepen the quantitative findings.

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Ethics Approval

Ethics Committee: Burdur Mehmet Akif Ersoy University Non-Interventional Clinical Research Ethics Committee

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Appendix-1 Fitnesssta Dopinge Yönelik Tutum Ölçeği (FDYTÖ)

Fitnesssta Dopinge Yönelik Tutum Ölçeği-FDYTÖ		Tamamen katılmıyorum	Katılmıyorum	Kısmen katılmıyorum	Fikrim yok	Kısmen katılıyorum	Katılıyorum	Tamamen katılıyorum
		1	2	3	4	5	6	7
1.	Fiziksel aktivite hedeflerime ulaşmak için doping maddesi (anabolik steroidler vb.) kullanırım.							
2.	Bir sporcu, doping içeren maddeleri kullanarak yarışmalarda dereceye girerse diskalifiye edilmelidir.							
3.	Doping maddelerinin satışı cezalandırılmalıdır.							
4.	İstediğim fiziksel görünüme kavuşmak için doping maddesi kullanırım.							
5.	Fiziksel becerilerimi artırmak için doping içeren maddeleri kullanırım.							
6.	Mükemmel bir fiziğe sahip olmak için doping içeren maddeleri kullanırım.							
7.	Doping içeren maddeleri kullanmak özgüvenin gelişmesine yardımcı olur.							
8.	Tanıdığım insanların çoğu onaylarsa doping içeren maddeleri kullanırım.							
9.	Gerçekten istediğim bir hedefe ulaşmak için doping içeren maddeleri kullanırım.							
10.	Egzersiz yapan kişilere doping içeren maddeleri veren antrenörler/eğitmenler cezalandırılmalıdır.							
11.	Doping içeren maddelerin kullanımı, egzersiz yapan kişilerin iyi oluş hâline katkı sağlar.							
12.	Doping içeren maddeleri kullanmak bir tür hiledir.							
13.	Fiziksel olarak beğenilmek için doping içeren maddeleri kullanırım.							
14.	Egzersiz yapan biri hedeflerine doping içeren maddelerin yardımı olmadan kendi çabasıyla ulaşmalıdır.							
15.	Başkalarına fiziksel olarak hoş görünmek için doping içeren maddeleri kullanırım.							

Puanlama Yönergesi

Altboyut ve madde sayısı: 3 alt boyut ve 15 madde

- 1.Niyetler ve öznel normlar: 1, 4, 5, 6, 8, 9, 13, 15
- 2.Tutumlar: 2, 3, 10, 12, 14
- 3.İnançlar: 7, 11

Ters maddeler: 2, 3, 10, 12, 14

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