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THE MEDIATING EFFECT OF INTERNAL OR EXTERNAL REGULATION FACTORS ON THE EFFECT OF HIGH SCHOOL STUDENTS' HEALTHY LIFESTYLE BELIEFS ON THEIR LEISURE TIME EXERCISE PARTICIPATION*

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Abstract: In the present study, it was aimed to determine the mediating effect of internal or external regulation factors on the effect of high school students' healthy lifestyle beliefs on their leisure time exercise participation. The population of the study consisted of high school students in all secondary education institutions within the Ministry of National Education in Konya Beyşehir, while the sample consisted of high school students in three secondary education institutions randomly selected from these secondary education institutions. Quantitative research methods and general survey model were used in the study. The research data were collected with the Healthy Lifestyle Beliefs Scale (HLBS), the Behavioral Regulations in Exercise-2 Scale and the Leisure Time Exercise Questionnaire (LTEQ) questionnaire. Before testing the hypotheses, confirmatory factor analysis (CFA) was conducted to verify the factor structures of the HLBS and the Behavioral Regulations in Exercise-2 Scale and the validity of the scales was confirmed. The hypotheses formed within the scope of the research were tested with structural equation modeling (SEM). According to the findings of the study, it was found that HLB positively and significantly affected internal regulation and negatively and significantly affected external regulation. It was found that internal regulation positively and significantly influenced SZEK, but the effect of external regulation on SZEK was insignificant. It was determined that HLB positively and significantly influenced LTEP through the mediation of internal regulation, which is the motivation to engage in exercise behavior, but the mediation effect of external regulation in the interaction between HLB and LTEP was not significant.

Keywords: Healthy living beliefs, Leisure time participation, Exercise behavior motivation, High school student

LİSE ÖĞRENCİLERİNİN SAĞLIKLI YAŞAM BİÇİMİ İNANÇLARININ SERBEST ZAMAN EGZERSİZ KATILIMLARINA ETKİSİNDE İÇSEL VEYA DIŞSAL DÜZENLEME FAKTÖRLERİNİN ARACILIK ETKİSİ

Öz: Mevcut araştırmada, lise öğrencilerinin sağlıklı yaş biçimi inançlarının serbest zaman egzersiz katılımlarına etkisinde içsel veya dışsal düzenleme faktörlerinin aracılık etkisinin belirlenmesi amaçlanmıştır. Araştırmanın evrenini Konya Beyşehir'de Milli Eğitim Bakanlığı bünyesindeki tüm ortaöğretim kurumlarındaki lise öğrencileri oluştururken örneklemini ise bu ortaöğretim kurumlarından rastlantısal olarak seçilen üç ortaöğretim kurumundaki lise öğrencileri oluşturmaktadır. Araştırmada nicel araştırma yöntemleri ve genel tarama modeli kullanılmıştır. Araştırma verileri Sağlıklı Yaşam Biçimi İnanç (SYBİ) Ölçeği, Egzersizde Davranışsal Düzenlemeler-2 Ölçeği ve Serbest Zaman Egzersiz Anketi (SZEA) ile toplanmıştır. Hipotezler test edilmeden önce SYBİ ölçeği ve EDDÖ-2'nin faktör yapılarının doğrulanması için doğrulayıcı faktör analizi (DFA) yapılmış ve ölçeklerin geçerliği doğrulanmıştır. Çalışma için üretilen hipotezler yapısal eşitlik çözümlemesi (YEM/SEM) ile test edilmiştir. Araştırma bulguları incelendiğine SYBİ'nin içsel düzenlemeyi pozitif yönlü ve anlamlı olarak, dışsal düzenlemeyi ise negatif yönlü ve anlamlı olarak etkilediği tespit edilmiştir. SZEK'yi içsel düzenlemenin pozitif yönlü ve anlamlı olarak etkilediği lakin dışsal düzenlemenin SZEK üzerindeki etkisinin ise anlamsız olduğu tespit edilmiştir. SYBİ'nin egzersiz davranışına yönelim motivasyonu olan içsel düzenlemenin aracılığı ile SZEK'yi pozitif yönlü ve anlamlı olarak etkilediği lakin SYBİ ile SZEK arasındaki etkileşimde dışsal düzenlemenin aracılık etkisinin anlamlı olmadığı tespit edilmiştir.

Anahtar Kelimeler: Sağlıklı yasam inancı, Serbest zaman katılımı, Egzersiz davranış motivasyonu, Lise öğrencisi

Bu çalışma ortaöğretim öğrencilerinin serbest zaman egzersiz katılım düzeyleri, sağlıklı yaşam biçimi inançları ve egzersizdeki davranışsal düzenlemeleri arasındaki ilişkilerin incelenmesi: Beyşehir örneği başlıklı yüksek lisans tezinden üretilmiştir.

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INTRODUCTION

The world population is being dragged into sedentary life. Digitalization (mobile banking, internet shopping, hospital appointments, etc.) and mechanization (cleaning, agriculture, office tools, etc.) encourage sedentary living. This starts in childhood and continues throughout life. Children who play in the streets are now replaced by children who spend time at home in front of the computer. A sedentary lifestyle not only leads to health issues but can also result in fatalities. According to a report from the World Health Organization (WHO), approximately 1.9 million people globally lose their lives each year due to inactivity. (WHO, 2002). Atilla (2017) states that an average of 3.2 million people die every year due to sedentary life. Although it is known that exercise, which is an important factor to prevent sedentary life, provides many benefits to human health, it is a known and thought-provoking situation that there are individuals who do not exercise (Ersöz, 2011). According to the US National Center for Health Statistics, exercise is characterized by intentional, organized, and repetitive physical movements aimed at sustaining or enhancing various aspects of physical fitness (NCHS, 2017). High school students have a stressful workload of school, courses and exams in order to fulfill their future responsibilities and duties. Stress is recognized for contributing to long-term health issues across multiple systems, including the digestive system, nervous system, immune system, cardiovascular system, and even leading to obesity (McEwen & Sapolsky, 2006). It is very important for secondary school students, who harbor stress at various stages of their lives, to evaluate their free time by exercising in order to raise a healthy generation (Kaplan, 2016; Yerlisu Lapa et al., 2016). In this context, it is curious how active high school age individuals, who are the determinants of future generations, are for a healthy life.

The WHO defines health not merely as the absence of illness or disability, but as a state of total physical, mental, and social well-being (Güner & Özkan, 2019). A healthy lifestyle involves managing all behaviors that impact health and structuring daily activities in a way that aligns with one's individual health status (Pender, 1987). Based on these definitions, it can be said that individuals with healthy lifestyle beliefs should prefer behaviors appropriate to their health status to protect their health and improve their quality of life. Physical activity, popularly known as "sports", is one of the most effective tools for individuals who try to survive among the gray concrete piles in dense urban life to get rid of physical and mental tension, to improve their health status or to protect their existing health status (Balcı, Çakaloğlu, Erdeveciler, Bolat, & Çelik, 2021). Being physically active is said to protect health and improve quality of life (Marquez et al., 2020). Therefore, it is extremely important to make exercise an indispensable part of our lives as one of the most effective ways to stay physically active. Motivation is an important factor that directs our exercise behavior (Tekkanat, 2008). Motivation is defined as a concept that mobilizes a person in a certain line with feelings such as need or passion (Adair, 2013). When discussing the concept of motivation, two motivational orientations such as internal regulation and external regulation are mentioned. Based on the Self-Determination Theory (SDT) proposed by Deci and Ryan (2000), internal regulation means taking action by taking into account one's own internal values and motivational factors, whereas external regulation refers to engaging in a behavior only to satisfy external pressures or to obtain externally imposed rewards. Individuals who exercise with the motivation of healthy living beliefs can perform their exercise behaviors in a more motivated way by activating their internal regulation factors. In this context, it can be said that internal regulation, which is a guiding factor in exercise behavior, is an important component of healthy living behaviors. In another study based on Health Behavior Theory, it was emphasized that beliefs about health behaviors increase the motivation to exercise (Razon & Sachs, 2021). In this context, it can be said that

individuals who want to exhibit healthy behaviors will want to exercise more under the influence of internal regulation factors.

It is thought that the level of healthy lifestyle beliefs of high school students, the level of their participation in exercise in their free time, which forms of behavioral regulation (internal regulation or external regulation) they tend to exercise under the influence of, and how these variables are in a relationship are important for future generations. The purpose of this study was to examine the mediating effect of internal or external regulation, which pertains to the motivation for exercise behavior, on the influence of high school students' beliefs about healthy lifestyles on their participation in leisure-time physical activities.

Literature Review

The interaction between healthy living beliefs/behaviors and exercise orientation factors of internal regulation and external regulation

Literature studies on the relationship between healthy living beliefs/behaviors and exercise orientation factors of internal regulation and external regulation were examined. Ahn and Kim (2022) applied fitness exercises to university students for 5 weeks, 3 days a week. Based on t-test and hierarchical regression analyses conducted before and after the exercise program, the results indicated that autonomous motivation significantly increased levels of healthy lifestyle beliefs (HLB) through consistent participation in exercise, demonstrating a strong correlation. Some studies in the literature have reported a positive and significant correlation between autonomous behaviors related to exercise motivation and psychological well-being, as well as a negative and significant relationship between controlled (non-autonomous) behaviors and psychological well-being (Ryan & Deci, 2000; Standage et al., 2012; Özdemir et al., 2016). Maltby and Day (2001) examined the exercise motivation and psychological well-being of university students who claimed to exercise regularly. They found that external motivation, which is effective in the exercise orientation of individuals who exercise, is associated with weaker psychological well-being and internal motivation is associated with stronger psychological well-being.

Interaction between internal regulation and external regulation, which are exercise orientation factors, and exercise/physical activity participation

Literature studies on the relationship between internal regulation and external regulation, which are exercise orientation factors, and exercise/physical activity participation were reviewed. In a review study (Teixeira et al., 2012), 53 research articles conducted with adults over the age of 18 were analyzed. As a result of the review, it was reported that there were positive and significant relationships between exercise behavior and internal regulation. In addition, although it was determined that there were studies that found negative significant relationships between exercise behavior and external regulation, many studies reported that there were insignificant relationships between exercise behavior and external regulation. Stephan et al., (2010), in their study with elderly individuals, interpreted the relationship between exercise behavior and internal regulation as positive and significant and the relationship between exercise behavior and external regulation as insignificant. In a study examining the exercise motivation and physical activity levels of university students, it was reported that individuals with high internal regulation (autonomous behavior) scores were moderately and highly active and individuals with high external regulation (controlled behavior) scores were less active (Ersöz et al., 2012). In a similar research study examining the motivation of university students

to exercise, it was reported that there were significant positive relationships between moderate and high intensity physical activity levels of university students and internal regulation, while the relationships between physical activity levels and external regulation were insignificant (Quartiroli & Maeda, 2014).

Interaction between healthy living beliefs/behaviors and exercise/physical activity participation

Literature studies on the relationship between healthy living beliefs/behaviors and exercise/physical activity participation were examined. Kudubeş et al., (2022), in a study conducted with adolescent students, reported that HLB affected exercise attitudes by 96.3% and physical activity attitudes by 93.6%. Kelly et al., (2011) investigated the relationship between the levels of HLB and healthy lifestyle behaviors among adolescents, including physical activity and nutrition, and found a positive correlation between HLB and physical activity behavior. Demirel Bozkurt and Yağız Altıntaş (2021) reported that there was a significant positive correlation between nursing students' leisure time exercise levels and total scores of the Healthy lifestyle scale. Positive significant relationships were found between healthy lifestyle behaviors and general health perceptions and exercise behaviors of university students studying in health programs (Ünalan et al., 2007).

METHOD

Research Model

In the present study, quantitative research method was used. The research model is the collection of data that serves the purpose of the study with economic conditions and the organization of conditions for analyzing the data. The general survey model refers to the survey designs implemented with either the entire population or a sample drawn from that population to obtain a comprehensive understanding of the overall opinions within the universe (Karasar, 2020). In this current study, the general survey model was used. The data collected within the scope of the research were analyzed with structural equation modeling (SEM). The hypotheses and models created in this context are presented below.

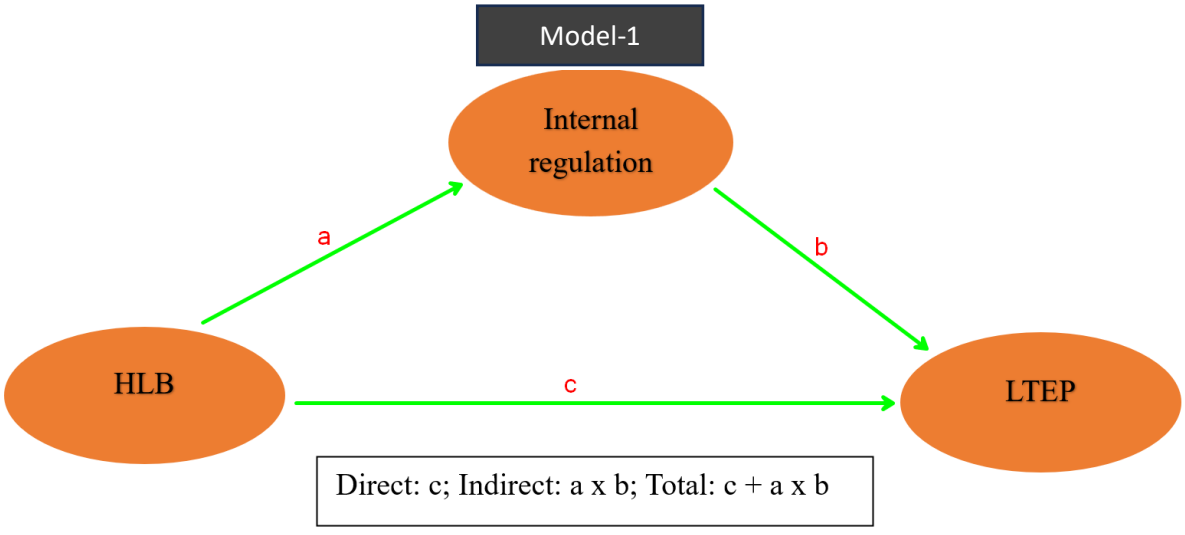

Figure 1. Mediating effect of internal regulation

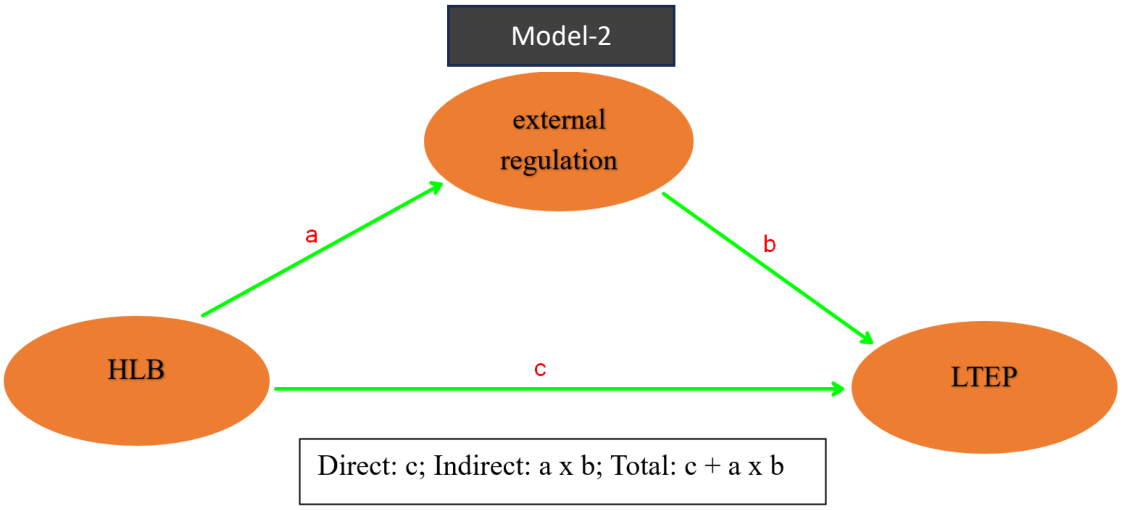

Figure 2. Mediating effect of external regulation

H1: *Healthy lifestyle belief (HLB) significantly affects internal and/or external regulation as motivation for exercise behavior.*
H2: *Internal and/or external regulation as motivation for exercise behavior significantly affects leisure time exercise participation (LTEP).*
H3: *Healthy lifestyle beliefs (HLB) significantly influence leisure-time exercise participation (LTEP) through internal regulation and/or external regulation as motivation to engage in exercise behavior.*

Population and Sample

The study population comprises high school students from all secondary education institutions in Beyşehir, Konya, under the Ministry of National Education. This includes Anadolu High Schools, Vocational and Technical Anadolu High Schools, Science High Schools, Anadolu Imam Hatip High Schools, and Multi-Program Anadolu High Schools. The sample group of the study includes high school students selected randomly from three secondary education institutions: Anatolian High School, Vocational and Technical Anatolian High School, and Science High School. Cluster sampling refers to a method in which all clusters in the population have an equal chance of being selected individually (Karasar, 2020). In this current study, disproportionate (random) cluster sampling method was used. Descriptive information for the participants of the study is given in Table 1.

Table 1. Percentage frequency information for participants

	Gender		School Type			Class Level				Grade Point Average			
	Female	Male	VTAHS	Anatolian H.S.	Science H.S.	9th g Class	10th Class	11th Class	12th Class	0-49	50-69	70-84	85-100
N	318	166	166	180	138	131	113	110	130	17	128	130	203
%	65,7	34,3	34,3	37,2	28,5	27,1	23,3	22,7	26,9	3,6	26,8	27,2	42,5

Data Collection Tool

The data collection tool for the study comprises four components: a personal information form, the Healthy Lifestyle Beliefs Scale (HLBS), the Behavioral Regulations in Exercise Scale-2 (BRES-2), and the Leisure Time Exercise Questionnaire (LTEQ)

The personal information form included descriptive information such as gender, school type, grade level and grade point average.

The Healthy Lifestyle Beliefs Scale (HLBS), developed by Melnyk and Small (2003), was adapted to Turkish culture, with its reliability and validity tested by Kaya (2019). It was reported that the scale is a valid and reliable tool for secondary school students between the ages of 14-19. The scale was developed to measure the healthy lifestyle beliefs of individuals in secondary education. The lowest total score to be obtained from the scale is 11 and the highest total score is 55. The overall internal consistency coefficient in the scale was determined as 0.78 (Cronbach Alpha) (Kaya, 2019).

The Behavioral Regulations in Exercise Scale-2 (BRES-2) is used to determine motivational orientations in exercise behaviors. It was introduced to the literature by Mullan et al., (1997). It was revised again by Markland and Tobin (2004) and was named as Behavioral Regulations in Exercise Scale-2 (BRES-2). The scale adapted into Turkish by Ersöz (2011) is a valid and reliable measurement tool. The scale translated into Turkish was re-presented to the literature as 19 items and 4 sub-dimensions [internal regulation (7 items), editing by introjection (4 items), external regulation (4 items) and amotivation (4 items)]. The scale items explained 54.61% of the inventory. Cronbach's alpha reliability coefficients of the scale were 0.81-0.77-0.67-0.69 for internal regulation, regulation by introjection, external regulation and amotivation, respectively. The BRES-2 is a 5-point Likert-type inventory that is scored on a scale from zero (0) to four (4) points as “definitely not true”, “sometimes true” and “definitely true” (Ersöz et al., 2012).

The Leisure Time Exercise Questionnaire (LTEQ) was introduced to the literature by Godin and Shephard (1985, 1997) to measure the exercise activity level of individuals in their free time. Its validity and reliability were tested by Yerlisu Lapa et al., (2016) on secondary school students aged 13-19 years studying in Antalya. The questionnaire consists of questions related to exercises performed as a leisure time activity for at least 15 minutes in the last 7 days. As a result of the exploratory factor analysis, it was reported that the questionnaire consisted of a single factor structure and could explain 48% of the total variance. The factor loadings of the survey questions were 0.74, 0.81 and 0.48 for each item. The stability level of the questionnaire was measured by test-retest method and the correlation scores obtained were 0.90, 0.93, 0.85 for each item and 0.94 for the overall questionnaire, respectively. In order to calculate the total score at the end of the questionnaire, high intensity activities were multiplied by 9, moderate intensity activities by 5 and mild intensity activities by 3 and the scores obtained were summed (Yerlisu Lapa et al., 2016).

Data Collection

The present research was ethically approved by Ağrı İbrahim Çeçen University Scientific Research Ethics Committee with the decision dated 23.03.2022 and numbered 76. Research permission was obtained from Konya Provincial Directorate of National Education with the letter dated 30.03.2022 and numbered E-83688308-605.99-46824545 to collect data from students in secondary education institutions in Beyşehir district of Konya province. After the permissions, data were collected from the students in the determined secondary education

institutions under the leadership of the institution supervisors. Data collection was conducted face-to-face in classrooms. Before the questionnaire application, the necessary explanations were made to the participants both verbally and in writing within the framework of ethical principles.

Data Analysis

Jamovi (version 2.5.6), a free and open-source computer program, was used for statistical analysis of the data collected within the scope of the study. Before starting the hypothesis tests, the reliability of the HLB and the mediating variables (internal regulation and external regulation) were tested with Cronbach's alpha (αHLBS=0.83; αinternal regulation=0.85; αexternal regulation=0.79) internal consistency coefficient. The scales used in the analyses were found to have sufficient reliability (α≥0.70) (Seçer, 2015). The validity of the HLB and the mediating variables was confirmed by confirmatory factor analysis (CFA) (Oktar, 2022). Reliability and validity analyses were not conducted for this questionnaire since the LTEP is not a scale but a questionnaire. Before proceeding to the hypothesis tests, normality assumption was checked for each variable (HLBS, internal regulation, external regulation, and LTEP). While determining the normality of the distribution of the data, skewness/skewness and kurtosis/ kurtosis coefficients and graphical (Histogram, Normal Q-Q Plot, Detrendet Normal Q-Q Plot and Box Plots) examinations were also made (Kline, 2011). To test the hypotheses, a mediation analysis based on Structural Equation Modeling was conducted. In this analysis, one independent (HLB), one dependent (LTEP) and 2 mediating variables (internal regulation and external regulation) were used. Analyses were conducted using the standard estimation method for SE's (Antalyalı & Alparslan, 2022).

FINDINGS

Confirmatory Factor Analysis (CFA) for Data Collection Tools

Table 2. Factor loadings for the BRES-2

Factors	Items	Estimate	SH	Z	p	Stand. Estimate
Internal Regulation	BRES15	0.87	0.05	18.72	< 0.001	0.76
	BRES18	0.94	0.05	18.59	< 0.001	0.75
	BRES10	1.02	0.05	21.74	< 0.001	0.83
	BRES4	0.55	0.05	9.90	<0.001	0.45
	BRES14	0.67	0.05	13.71	< 0.001	0.59
	BRES8	0.92	0.06	16.10	< 0.001	0.68
	BRES3	0.69	0.04	15.53	< 0.001	0.65
Editing by Introjection	BRES17	1.02	0.05	19.26	< 0.001	0.81
	BRES13	0.99	0.06	17.22	< 0.001	0.74
	BRES2	0.77	0.05	14.68	< 0.001	0.65
	BRES7	0.61	0.05	12.44	< 0.001	0.57
External Regulation	BRES11	0.61	0.04	13.92	< 0.001	0.70
	BRES6	0.47	0.04	11.74	< 0.001	0.59
	BRES16	0.65	0.05	13.96	< 0.001	0.70
	BRES1	0.38	0.05	8.26	< 0.001	0.44
Amotivation	BRES9	0.90	0.05	16.79	< 0.001	0.73
	BRES19	0.78	0.05	17.05	< 0.001	0.74
	BRES5	0.55	0.05	10.72	< 0.001	0.51
	BRES12	0.65	0.05	14.10	< 0.001	0.64

Table 2 shows the factor loadings resulting from the confirmatory factor analysis (CFA) conducted for the Behavioral Regulation in Exercise Scale-2 (BRES-2). When the table is examined, it is determined that the factor loadings of each scale item are at an acceptable level (Stand. Estimate>0.30) and significant (p<0.001).

Table 3. Factor covariances for the BRES-2

		Estimate	SH	Z	p	Stand. Estimate
Internal Regulation	Editing by Introjection	0.56	0.04	13.93	< 0.001	0.56
	External Regulation	-0.10	0.06	-1.78	0.075	-0.10
	Amotivation	-0.74	0.03	-23.45	< 0.001	-0.74
Editing by Introjection	External Regulation	0.27	0.06	4.84	< 0.001	0.27
	Amotivation	-0.30	0.05	-5.67	< 0.001	-0.30
External Regulation	Amotivation	0.28	0.06	4.76	< 0.001	0.28

Table 3 shows the factor covariance values that emerged as a result of the confirmatory factor analysis (CFA) for the Behavioral Regulation in Exercise Scale-2 (BRES-2). When the table is examined, it is seen that the covariances between the other factors are significant ($p<0.001$) except for the covariance between internal regulation and external regulation factors. It was found that internal regulation showed an inverse/negative relationship with amotivation (Stand. Est: -0.74) and the same/positive relationship with regulation by introjection (Stand. Est: 0.56). Editing by Introjection showed an inverse/negative relationship with amotivation (Stand. Est: -0.30) and the same/positive relationship with external regulation (Stand. Est: 0.27). In addition, it was determined that there was a same/positive relationship (Stand. Est: 0.28) between external regulation and amotivation.

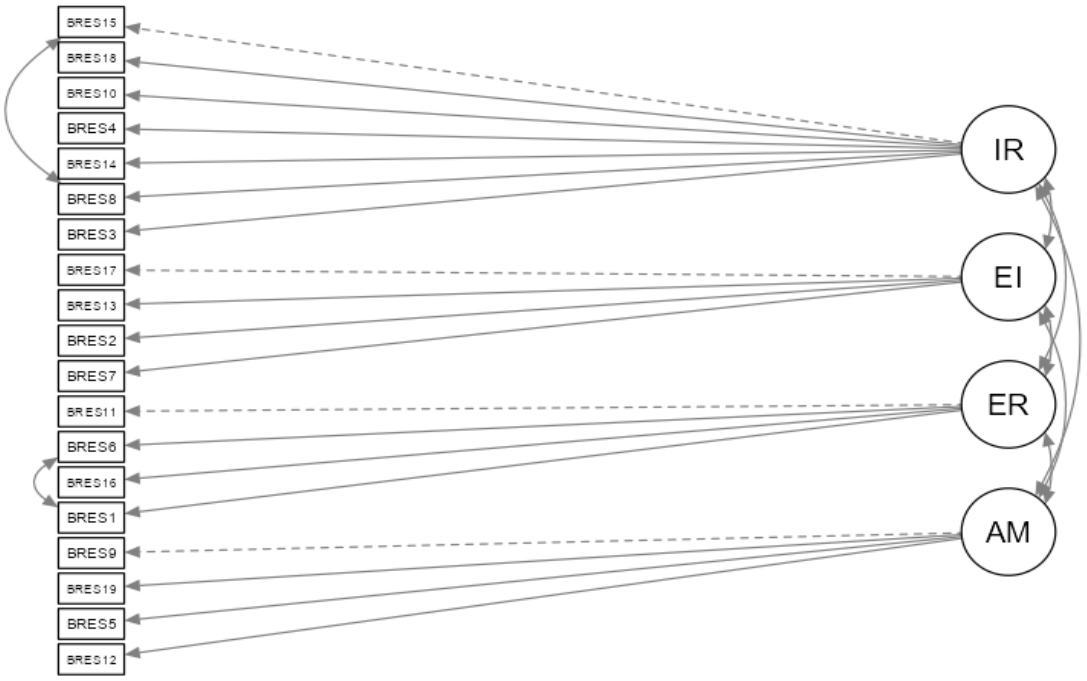

Figure 3. Factor structure of the BRES-2

Figure 3shows the factor structure of the BRES-2, whose structural validity was confirmed. According to the figure, it can be said that internal regulation (IR) consists of 7 items, and Editing by Introjection (EI), external regulation (ER) and amotivation (AM) consist of 4 items

each, and the 19-item structure of the scale was confirmed. In addition, considering the modification results, items 8 and 15 and items 1 and 6 were associated with covariance lines.

Table 4. Model fit values for the BRES-2

Fit Indexes	Accepted Reference Intervals for Fit Indexes	BRES-2
p	p significance value for $\chi 2$	< 0.001
$\chi 2$/df	$0.00 \leq \chi 2/df \leq 5.00$	2.60
CFI	$0.90 \leq CFI \leq 1.00$	0.93
TLI	$0.90 \leq TLI \leq 1.00$	0.91
SRMR	$0.00 \leq SRMR \leq 0.09$	0.05
RMSEA	$0.00 \leq RMSEA \leq 0.10$	0.06

Note: Reference intervals were provided by Yurt (2023).

Table 4 shows the goodness-of-fit values examined for the verification of the factor structure of the BRES-2 and the accepted reference ranges for these values. When the goodness of fit values for the related scale are examined, it is seen that the 4-dimensional (IR, EI, ER and AM) factor structure of the scale has acceptable fit values ($\chi 2$/df=2.60, CFI=0.93, TLI=0.91, SRMR=0.05, RMSEA=0.06). For this reason, it can be said that the BRES-2 used in this study is compatible with the Turkish adapted structure.

Table 5. Factor loadings for HLBS

Factor	Items	Estimate	SH	Z	p	Stand. Estimate
Beliefs about Health Behaviors	HLBS1	0.53	0.05	11.0	< 0.001	0.54
	HLBS2	0.71	0.05	14.0	< 0.001	0.67
	HLBS6	0.73	0.05	13.9	< 0.001	0.66
	HLBS7	0.67	0.05	13.1	< 0.001	0.64
	HLBS10	0.73	0.06	12.8	< 0.001	0.64
	HLBS11	0.74	0.05	13.6	< 0.001	0.66
Beliefs about Problem Solving	HLBS3	0.67	0.05	12.7	< 0.001	0.59
	HLBS4	0.56	0.05	10.2	< 0.001	0.52
	HLBS5	0.77	0.05	15.1	< 0.001	0.70
	HLBS8	0.68	0.06	11.6	< 0.001	0.55
	HLBS9	0.84	0.05	16.1	< 0.001	0.74

Table 5 shows the factor loadings that emerged as a result of the confirmatory factor analysis (CFA) conducted for the HLBS. When the table is examined, it is determined that the factor loadings of each scale item are at an acceptable level (Stand. Estimate>0.30) and significant (p<0.001).

Table 6. Factor covariances for HLBS

		Estimate	SH	Z	p	Stand. Estimate
Beliefs about Health Behaviors	Beliefs about Problem Solving	0.51	0.05	9.97	< 0.001	0.51

Table 6 shows the factor covariance value that emerged as a result of the confirmatory factor analysis (CFA) conducted for the HLBS. When the table is examined, it is determined that there is a same/positive (Stand. Est: 0.51) and significant (p<0.001) relationship between the belief factor for health behaviors and the belief factor for problem solving.

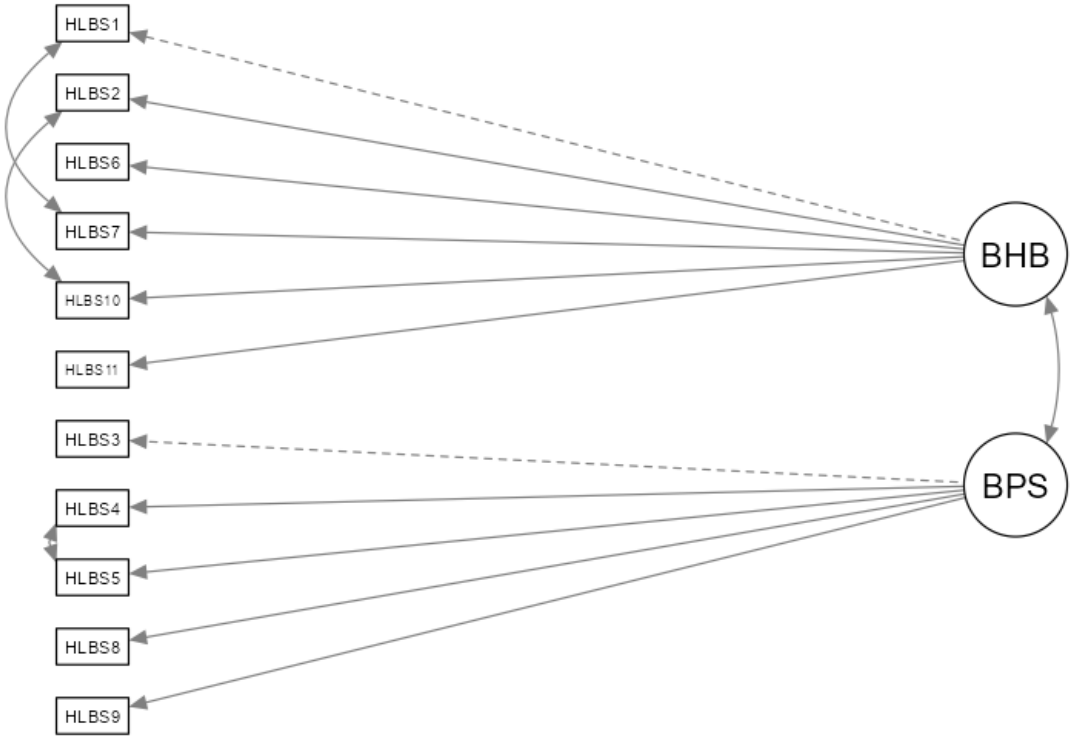

Figure 4. Factor structure of the HLBS

Figure 4 shows the factor structure of the HLBS whose structural validity was confirmed. According to the figure, it can be said that the beliefs about health behaviors (BHB) factor consists of 6 items and the beliefs about problem solving (BPS) factor consists of 5 items and the 11-item structure of the scale was confirmed. In addition, considering the modification results, items 1 and 7, 2 and 10, and 4 and 5 were associated with covariance lines.

Table 7. Model fit values for HLBS

Fit Indexes	Accepted Reference Intervals for Fit Indexes	HLBS
p	p significance value for $\chi 2$	< 0.001
$\chi 2$/df	$0.00 \leq \chi 2/df \leq 5.00$	4.10
CFI	$0.90 \leq CFI \leq 1.00$	0.93
TLI	$0.90 \leq TLI \leq 1.00$	0.90
SRMR	$0.00 \leq SRMR \leq 0.09$	0.06
RMSEA	$0.00 \leq RMSEA \leq 0.10$	0.08

Note: Reference intervals provided by Yurt (2023).

Table 7 shows the goodness of fit values examined for the verification of the factor structure of the HLBS and the accepted reference ranges for these values. When the goodness of fit values for the scale are examined, it is seen that the 2-dimensional (BHB and BPS) factor structure of the scale has acceptable fit values ($\chi 2$/df=4.10, CFI=0.93, TLI=0.90, SRMR=0.06, RMSEA=0.08). For this reason, it can be said that the HLB scale used in this study is compatible with the Turkish adapted structure.

Mediating Variable Analyses

Table 8. Path/effect coefficients for the mediating effect of internal and external regulation in the interaction of HLB and LTEP

Mediating Variable	Variables	Path	Estimate	SH	Z	p
Internal Regulation (Model-1)	HLB→ Internal R.	a	0.33	0.03	9.79	0.00**
	Internal R. → LTEP	b	1.22	0.16	7.75	0.00**
	HLB → LTEP	c	-0.01	0.13	-0.08	0.93
External Regulation (Model-2)	HLB → External R.	a	-0.03	0.02	-2.16	0.03*
	External R. → LTEP	b	-0.16	0.36	-0.43	0.66
	HLB → LTEP	c	0.39	0.13	3.11	0.00*

*p<0,05; **p<0,001

Table 8 shows the path coefficients of the mediation effect created as model-1 (Figure 1) and model-2 (Figure 2) and the significance/ significance levels of these coefficients. When the table is examined, according to model-1 in which internal regulation, which provides motivational orientation to exercise, is mediated by internal regulation, the effect of HLB on the variable of internal regulation is Est: 0.33, p<0.001 and positive. The effect of internal regulation on the LTEP variable is Est: 1.22, p<0.001 and positive. Disregarding the effect of internal regulation, the direct effect of HLB on the variable LTEQ is Est: -0.01, p>0.05 and insignificant. When these results are evaluated, paths a and b are significant while path c is insignificant. According to the model-2 in which external regulation mediated by the motivational orientation to exercise, the effect of HLB on the external regulation variable is Est: -0.03, p<0.05 and it is negative. The effect of external regulation on the LTEQ variable is Est: -0.16, p>0.05 and insignificant. Disregarding the effect of external regulation, the direct effect of HLB on the LTEP variable is Est: 0.39, p<0.05 and is positive. When these results are evaluated, paths a and c are significant while path b is insignificant.

Table 9. The mediating role of internal and external regulation in the effect of HLB on LTEP

Mediating Variable	Effect	Path	Estimate	SH	Z	p	%
Internal Regulation (Model-1)	Indirect	a × b	0.41	0.07	6.08	0,00**	97.44
	Direct	c	-0.01	0.13	-0.08	0.93	2.56
External Regülation (Model-2)	Indirect	a × b	0.01	0.01	0.42	0.67	1.34
	Direct	c	0.39	0.13	3.11	0.00*	98.66
Total		c + a x b	0.40	0.13	3.17	0.00*	100.00

*p<0,05; **p<0,001

In Table 9, model-1 (Figure 1) and model-2 (Figure 2) in which internal and external regulation mediating motivational orientation to exercise were tested and the significance/ significance levels of indirect, direct and total effect coefficients generated for these models are given. When model-1, in which internal regulation that provides motivational orientation to exercise is mediated, was tested, it was found that the indirect effect of HLB on the variable LTEP was positive and significant at the Est: 0.41 level (p<0.001). Again, when the direct effect was tested for model-1, it was found that the effect was negative and insignificant at the level of Est: -0.01 (p>0.05). When model-2, which is mediated by external. regulation that provides motivational orientation to exercise, was tested, it was determined that the indirect effect of HLB on the LTEP variable was found to be Est: 0.01 and insignificant (p>0.05). Again, when the direct effect was tested for model-2, it was found that the effect was positive and significant at the Est: 0.39 level (p<0.05). The total effect for model-1 and model-2 in the table was found to be positive and significant at the Est: 0.40 level (p<0.05). When these results were evaluated, it was found that the indirect effect (a × b path) was positive and significant (p<0.001), while the direct effect (c path) was insignificant (p>0.05) in model-1 mediated by internal regulation. In

addition, it was determined that 98.66% of the total effect (c + a × b path) in this model was caused by the direct effect. In the model-2 mediated by external regulation, it was found that the indirect effect (a × b path) was insignificant ($p>0.05$), while the direct effect (c path) was positive and significant ($p<0.05$). In addition, it can be said that 97.44% of the total effect in this model is due to the indirect effect.

4. DISCUSSION AND CONCLUSION

H1: Healthy lifestyle beliefs (HLB) significantly affect internal or external regulation, which is the motivation to engage in exercise behavior.

When the research findings (table 2) were examined, it was found that HLB positively affected internal regulation, which is the motivation to exercise behavior, and negatively and significantly affected external regulation. Maltby and Day (2001) stated that internal motivation is more strongly related to psychological well-being than external motivation. In their study, Ryan and Deci (2007) reported that HLB increased exercise participation by affecting internal regulation. Ingledew, Markland and Ferguson (2009) reported that healthy living beliefs were related to internal regulation. In another study, it was reported that individuals' internal motivation to exercise behavior increased depending on their healthy life goals (Teixeira, Carraca, Markland, Silva &Ryan, 2012). Contrary to these results and research findings, no study was found that reported that HLB did not affect or insignificantly predicted the internal regulation that leads to exercise orientation. On the other hand, it has been stated that when exercise orientation is provided with external regulation, HLB may have a significant effect on exercise participation (Standage, Duda & Ntoumanis, 2003). In another study, it has been reported that HLB may increase exercise participation by supporting external regulation (Markland & Tobin, 2004). According to the free will theory (Deci & Ryan, 2000), behaviors that are performed under the influence of external pressures and rewards are behaviors performed under the influence of non-autonomous motivational factors, that is, more external regulation factors. On the contrary, behaviors that are performed because they provide pleasure or happiness are behaviors that are performed under the influence of autonomous motivational factors, that is, more internal regulation factors. In addition, in the same theory, internal goals for one's own health are also associated with internal motivation. Based on this information, it is thought that individuals who associate healthy living with exercise take action under the influence of internal factors and feel pleasure and happiness at the end of exercise behaviors. For this reason, it can be said that HLB affects internal regulation, which is the motivation to exercise, more than external regulation.

H2: Internal or external regulation, which is the motivation to engage in exercise behavior, significantly affects LTEP.

When the findings of the current research (table 2) are examined, it is found that internal regulation positively and significantly affects the LTEP, but external regulation does not significantly affect the LTEP. Studies on related issues were examined in the literature. It has been reported that internal regulation positively and significantly affects exercise behavior in a weight loss program and external regulation negatively and significantly affects exercise behavior (Edmunds, Ntoumanis & Duda, 2007). While exercise participation was significantly and positively predicted by internal regulation, it was not significantly predicted by external regulation (Ingledew, Markland & Ferguson, 2009). It has been reported that physical activity has a positive and significant relationship with internal regulation, but not with external regulation (Markland, 2009). In their review study, Teixeira et al., (2012) found that there were

strong and positive relationships between LTEP and internal regulation, whereas external regulation was more related to social expectations and rewards. It was stated that individuals with high internal regulation scores were moderately and highly active and individuals with high external regulation scores were less active (Ersöz et al., 2012). In a study examining the effect of internal motivation and external regulation on moderate physical activity, it was reported that only internal motivation had a significant and positive effect (Kalajas-Tilga, Koka, Hein, Tilga &Raudsepp, 2020). When the findings of the study and the studies in the literature are evaluated holistically, it can be said that internal regulation has a positive and significant effect on LTEP, while external regulation generally does not have a significant effect. It is also seen that this result is in line with the expectations of the Free Will Theory (Deci & Ryan, 2000).

H3: Healthy lifestyle beliefs (HLB) significantly affect leisure time exercise participation (LTEP) through internal regulation or external regulation, which are the motivation to engage in exercise behavior.

When the findings of the current research (table 3) are examined, it was found that the HLB positively and significantly influences LTEP through internal regulation, but the effect of HLB on LTEP is not significantly mediated by external regulation. No study directly related to the research hypothesis was found in the foreign and national literature. In addition, according to the findings of the current research and the results of academic studies in the literature, there is a significant mediation effect between the HLB and internal regulation that supports exercise orientation (Ingledew, Markland & Ferguson, 2009; Maltby & Day, 2001; Ryan & Deci, 2007; Teixeira, Carraca, Markland, Silva & Ryan, 2012) and between internal regulation and HLB (Edmunds, Ntoumanis & Duda, 2007; Ersöz et al., 2012; Ingledew, Markland & Ferguson, 2009; Teixeira et al,. 2012), it is seen that there are significant and positive relationships. According to the free will theory (Deci & Ryan, 2000), meeting three basic psychological needs (autonomy, competence and relatedness) activates the internal motivation of individuals. Based on the free will theory, it is thought that individuals who associate exercise behavior with healthy life will participate in LTEP under the influence of internal regulation factors. As a matter of fact, McDonough & Crocker (2007) stated that the need for relatedness activates autonomous, that is, internal regulation factors. In addition, in another study, it was reported that fitness and health concepts were among the most important reasons for participation in physical activity (Sit, Kerr & Wong, 2008). The results of the related studies strengthen the idea that healthy life beliefs will direct exercise behavior and when this relationship is achieved, internal motivation will mediate this relationship. For this reason, considering the findings of the study and the information obtained from the aforementioned literature sources, it is thought that HLB has a positive and significant effect on LTEP through internal regulation. On the contrary, there is no strong evidence in the literature indicating that external regulation mediates the interaction between LTEP and HLB. For this reason, considering the research findings and literature sources, it is thought that external regulation does not significantly mediate the interaction between LTEP and HLB.

Recommendations

- The mediating effects of the exercise behavior orientation factors (i.e., internalizing regulation and amotivation) on the interaction between HLB and LTEP can be examined.
- Interaction or mediation effects between healthy lifestyle behaviors, behavioral adjustments to physical activity and exercise factors (internal regulation, internalizing regulation, externalizing regulation and amotivation) can be examined.

- In the aforementioned research topics, samples were generally selected from university students and adults. These topics can also be studied with adolescents or middle school students.
- A critical step can be taken for a healthy generation by increasing equipped and safe areas for primary, middle and high school students to exercise with municipalities and local administrative administrations.
- Exercise activities of high school students in secondary education institutions can be increased. İnternal motivation of students and instructors should be increased.
- The number of indoor sports halls in education and training institutions within the Ministry of National Education can be increased and students can be encouraged to use these areas for exercise.

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