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RESEARCH ARTICLE OPEN ACCESS

Relationship between exercise motivation and readiness to engage in regular physical exercise among university students

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Abstract
Objective: This study aimed to identify students' readiness to engage in regular physical exercise among university students.
Methods: A descriptive predictive correlational design was used. A simple random sample of 400 undergraduate students was recruited from seven colleges at The Missan University, Iraq. Data were collected using the Stages of Change Scale (Short and Continuous Forms) and the Exercise Motivations Inventory-2 (EMI-2). Pearson correlation, independent t-tests, and ANOVA were used for data analysis.
Results: Age (r=.335, p=0.01), family socioeconomic status (r=.136, p=0.01), and BMI (r=.133, p=0.01) positively correlated with readiness to engage in regular physical exercise. Significant gender differences were found in both Stages of Change (t=3.028, p=0.003) and exercise motivation (t=3.421, p=0.001), with males scoring higher. Significant differences in exercise motivation were observed across Stages of Change groups (F=62.593, p<0.001) and grade levels (F=9.761, p<0.001).
Conclusion: Higher family socioeconomic status and greater BMI were associated with increased readiness for regular physical exercise. Exercise motivation and readiness to exercise are strongly correlated, with significant variations by gender, grade level, and stage of change.

Keywords: Exercise motivation, Physical activity readiness, University students, Stages of change, Transtheoretical Model

Plain English Summary

Staying physically active is important for good health, yet many university students do not exercise regularly. The university years are a key time for building lifelong habits, so we wanted to understand what motivates students to exercise and whether they feel ready to make physical activity part of their routine.

We surveyed 400 students at Missan University to measure their exercise motivation and their readiness to engage in regular physical activity. We found that students who were more motivated were also more ready to exercise. Older students, those with higher body weight (BMI), and those from higher socioeconomic backgrounds showed greater readiness. Male students reported higher motivation and readiness than female students, and differences were also seen across academic years.

These results matter because they show that motivation is strongly linked to students' willingness to exercise. By identifying who may need more support, universities can design better programs to help students become more active and develop healthier lifestyles for the future.

Introduction

Physical activity (PA) refers to any bodily movement produced by skeletal muscles that increases energy expenditure above resting levels, whether through structured exercise or everyday activities such as walking, cycling, or household tasks (1, 2, 3, 4). Engaging in at least 150 minutes of moderate-to-vigorous physical

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activity per week is strongly recommended to prevent noncommunicable diseases, including cardiovascular disease, diabetes, obesity, and certain cancers (5, 6). Despite these well-established benefits and global recommendations, physical inactivity remains a serious public health issue. Recent reports indicate that nearly one-third of adults worldwide do not meet recommended physical activity levels (6, 7). This problem is particularly concerning among young adults and university students, where high rates of inactivity have been documented (8, 9).

The university period represents a critical stage of life in which long-term health behaviours are established. However, academic stress, lifestyle transitions, reduced structured sports participation, and increased sedentary habits often contribute to a decline in physical activity during these years. Readiness to engage in regular exercise is not determined by physical factors alone; it is also shaped by psychological and social influences such as motivation, self-efficacy, and perceived support (10). The Transtheoretical Model (TTM) explains behaviour change as a progression through stages, ranging from precontemplation to maintenance, with motivation playing a key role in movement across these stages (11). Previous research has shown that exercise identity, commitment, and self-efficacy significantly contribute to exercise adherence (12, 13) and that individuals in more advanced stages of change tend to report stronger, more self-determined motivation (11).

While these relationships have been widely studied in Western and some Asian populations (11, 14, 15), there is limited evidence from Middle Eastern countries, particularly Iraq. Cultural norms, gender roles, socioeconomic differences, and limited access to recreational facilities may uniquely shape exercise behaviours among Iraqi university students. Moreover, the potential mediating roles of exercise identity and adherence in linking motivation to readiness for regular exercise have not been sufficiently examined in this context (12, 13). Given the rising concerns about sedentary lifestyles and their health consequences among young adults (6, 7). Understanding these factors within the Iraqi setting is both timely and necessary.

Therefore, this study aimed to identify students' readiness to engage in regular physical exercise and investigate differences in readiness and motivation according to gender, stage of change, and academic grade. By situating this research within the Iraqi university context and grounding it in established behavioural theory, the study seeks to provide evidence that can inform targeted and culturally appropriate interventions to promote physical activity among university students.

Materials and Methods

Study Design

A descriptive predictive correlational design was used.

Study Setting

The study was conducted in the colleges of Pharmacy, Dentistry, Sciences, Nursing, Physical Education and Sport Sciences, Education, and Basic Education at Missan University.

Sample and Sampling

A simple random sampling technique was used to recruit undergraduate students from seven colleges at Missan University (Pharmacy, Dentistry, Sciences, Nursing, Physical Education and Sport Sciences, Education, and Basic Education). The sample size of 400 participants was determined using the Cochran formula for sample size estimation for correlational studies, calculated to achieve 80% statistical power with a significance level of $\alpha = 0.05$ and a medium effect size. This sample size was considered sufficient to detect meaningful associations between exercise motivation and readiness for regular physical exercise.

Students were approached during scheduled lecture hours between March and May 2025. After obtaining institutional approval, the researcher coordinated with faculty members to access classrooms. The study purpose was explained to students, and those who agreed to participate signed an informed consent form before completing the questionnaire. Of approximately 450 students approached, 400 agreed to participate and returned completed questionnaires, yielding a response rate of 88.9%.

Study Instrument

Sociodemographic and Anthropometric Data

Participants provided information on age, gender, grade level, parents' education, household occupation, family monthly income, self-reported height, and weight. Body Mass Index (BMI) was calculated using the standard formula: weight (kg) divided by height in meters squared (kg/m^2). Height and weight were self-reported by participants.

Stages of Change Scale for Regular Physical Exercise

Readiness to engage in regular physical exercise was assessed using the Stages of Change Scale based on the Transtheoretical Model. The short form classifies individuals into five stages: precontemplation, contemplation, preparation,

action, and maintenance. The continuous form provides a quantitative score reflecting progression across stages, with higher scores indicating greater readiness for regular exercise. In the current study, the Cronbach's alpha coefficient for the continuous form was α = 0.79 (16).

Exercise Motivations Inventory-2 (EMI-2)
Exercise motivation was measured using the Exercise Motivations Inventory-2 (EMI-2), which assesses multiple dimensions of exercise motivation, including intrinsic motives (e.g., enjoyment, challenge) and extrinsic motives (e.g., appearance, social recognition). Items are rated on a Likert scale, with higher scores indicating stronger motivation to engage in physical exercise. In this study, the EMI-2 demonstrated good internal consistency, with a Cronbach's alpha coefficient of α = 0.87 (16).

Data Collection Procedure
Data were collected between March and May 2025. After receiving ethical approval from the Institutional Review Board and official permission from the university administration, the researcher visited selected colleges according to a prearranged schedule. Participants were informed about the purpose of the study, assured of confidentiality and anonymity, and informed that participation was voluntary. Questionnaires were administered in paper format and completed during class time, requiring approximately 15–20 minutes. Completed questionnaires were collected immediately after completion to ensure a high response rate and reduce missing data.

Data Analyses
Data were analysed using IBM SPSS version 27. Descriptive statistics (frequencies, percentages, means, and standard deviations) were calculated to summarise sociodemographic characteristics and main study variables. Pearson correlation coefficients were computed to examine relationships between continuous variables, including age, BMI, family socioeconomic status, Stages of Change scores, and exercise motivation. Independent samples t-tests were used to compare gender differences in Stages of Change and exercise motivation. One-way ANOVA was conducted to examine differences across grade levels and Stages of Change groups. Statistical significance was set at $p < 0.05$.

Results
Most participants were aged 21–23 years (60.0%) and female (57.0%). Most students were in the second academic year (42.5%). Nearly half (42.5%) belonged to the upper-middle socioeconomic class (Table 1). Table 2 summarises the quantitative descriptive statistics.

Table 1. Participants' sociodemographic characteristics (n = 400)

Variable	Category	n	%
Age (years): Mean ± SD = 21.49 ± 1.62	18-20	103	25.8
	21-23	240	60.0
	24-25	57	14.2
Gender	Male	172	43.0
	Female	228	57.0
Grade level	First	43	10.8
	Second	170	42.5
	Third	111	27.8
	Fourth	76	19.0
Father's education	Illiterate	3	0.8
	Read and write	35	8.8
	Elementary	29	7.2
	Middle school	94	23.5
	High school	59	14.8
	Diploma	63	15.8
	Bachelor's	69	17.2
	Postgraduate diploma	16	4.0
	Master's	26	6.5
	Doctoral	6	1.5
Mother's education	Illiterate	15	3.8
	Read and write	63	15.8
	Elementary	76	19.0
	Middle school	63	15.8
	High school	67	16.8

	Diploma	23	5.8
	Bachelor's	65	16.2
	Doctoral	28	7.0
Socioeconomic class	Lower	3	0.8
	Upper lower	95	23.8
	Lower middle	126	31.5
	Upper middle	170	42.5
	Upper	6	1.5

Table 2: Descriptive Statistics for Main Study Variables (N=400)

Variable	Mean	SD	Possible Range	Observed Range
Stages of Change Score	66.84	14.21	20–100	28–96
Exercise Motivation Score	3.58	0.62	1–5	1.84–4.92

Pearson correlation analysis revealed a moderate positive correlation between Stages of Change and exercise motivation ($r = .503$, $p < .001$), indicating that higher motivation was associated with greater readiness for regular exercise. Age showed a significant positive correlation with Stages of Change ($r = .335$, $p < .01$) and exercise motivation ($r = .397$, $p < .01$). BMI was positively correlated with Stages of Change ($r = .133$, $p < .01$), but negatively correlated with exercise motivation ($r = −.149$, $p < .01$). Family socioeconomic status was inversely correlated with exercise motivation ($r = −.281$, $p < .01$). Effect size interpretation indicated that the relationship between motivation and readiness was moderate. See Table 3.

Table 3: Pearson correlation among age, family socioeconomic status, body mass index, Stages of Change, and exercise motivation

	1	2	3	4	5
Age	-				
Family socioeconomic status	-.142**	-			
BMI	-.031	.246**	-		
Stages of Change	.335**	.136**	.133**	-	
Exercise Motivation	.397**	-.281**	-.149**	.503**	-

**. Correlation is significant at the 0.01 level (2-tailed).

Independent samples t-tests showed significant gender differences in Stages of Change, $t (398) = 3.03$, $p = .003$, Cohen's $d = 0.30$, with males scoring higher. exercise motivation differed significantly by gender, $t (398) = 3.42$, $p = .001$, Cohen's $d = 0.34$. See Table 4

Table 4: Gender-wise differences in Stages of Change and exercise motivation
Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Stages of Change	Equal variances assumed	6.245	.013	3.028	398	.003	4.32354	1.42773	1.51671	7.13038
	Equal variances not assumed			3.084	389.032	.002	4.32354	1.40180	1.56748	7.07960
Exercise Motivation	Equal variances assumed	1.622	.204	3.421	398	.001	5.96603	1.74396	2.53752	9.39455
	Equal variances			3.463	383.148	.001	5.96603	1.72293	2.57846	9.35361

	not assumed					

df: Degree of Freedom, F: F-Statistics, t: T-Statistics, Sig: Significance, Std. Error Difference: Standard Error Difference

The study results reveal a statistically significant difference in exercise motivation across Stages of Change groups (p = 0.01). See Table 5.

Table 5: Differences in Stages of Change and exercise motivation among Stages of Change groups

		ANOVA				
		Sum of Squares	**df**	**Mean Square**	**F**	**Sig.**
Exercise Motivation	Between Groups	47393.591	4	11848.398	62.593	.000
	Within Groups	74770.487	395	189.292		
	Total	122164.078	399			

df: Degree of Freedom, F: F-Statistics, t: T-Statistics, Sig: Significance, Std. Error Difference: Standard Error Difference

One-way ANOVA showed significant differences in Stages of Change across grade levels, F (3,396) = 3.15, p = .025, η^2 = 0.023. Exercise motivation also differed significantly across grade levels, F(3,396) = 9.76, p < .001, η^2 = 0.069. See Table 6.

Table 6: Differences in Stages of Change and exercise motivation among grade groups

		ANOVA				
		Sum of Squares	**df**	**Mean Square**	**F**	**Sig.**
Stages of Change	Between Groups	1897.202	3	632.401	3.151	.025
	Within Groups	79474.158	396	200.692		
	Total	81371.360	399			
Exercise Motivation	Between Groups	8411.372	3	2803.791	9.761	.000
	Within Groups	113752.705	396	287.254		
	Total	122164.078	399			

df: Degree of freedom, F: F-statistic, Sig: Significance

Discussion

This study examined readiness to engage in regular physical exercise and its relationship with exercise motivation among university students. Four main findings emerged. First, exercise motivation showed a moderate positive correlation with readiness for regular exercise. Second, age was positively associated with both readiness and motivation. Third, significant gender differences were observed, with male students reporting higher readiness and motivation than females. Fourth, significant differences were found across grade levels in both readiness and motivation.

There was a statistically significant positive correlation between age and Stages of Change. Age plays a significant role in an individual's willingness to engage in regular physical activity, as younger individuals often exhibit greater motivation but encounter obstacles such as fatigue. In contrast, older adults may experience reduced Self-Efficacy and increased inactivity. Studies employing frameworks such as the Transtheoretical Model (Stages of Change) link age to distinct exercise motivations and self-efficacy levels, indicating that older populations may benefit from targeted interventions that address these barriers (17). Older individuals exhibit greater readiness for exercise behaviour change, consistent with patterns in which advancing age accelerates progression through TTM stages such as Action and Maintenance (18).

There was a statistically significant positive correlation between age and exercise motivation. This finding implies that the older the students, the greater the motivation they experience. Across the lifespan, age is systematically related to exercise motivation, but the direction and type of motivation change rather than a simple linear correlation. Younger adults and adolescents tend to report higher overall motivation for exercise, often driven by appearance, competition, social recognition, and fun (19). Stages of Change and motivation show the strongest link (r=0.503**, moderate-strong), as advancing from Precontemplation to Maintenance typically increases self-determined exercise motives (11). This finding aligns with recent research comparing Iranian and Iraqi university students, which found that Iraqi students particularly value psycho-emotional

outcomes—such as personal growth and emotional development—as key motivators for recreational sports participation (Ahmed et al., 2025).

The study results showed a statistically significant difference in Stages of Change for engaging in regular physical exercise between gender groups. Further descriptive statistics demonstrated that male participants scored higher on the Stages of Change Scale. This finding implies that male participants have greater readiness to engage in regular physical exercise. Across studies using the Transtheoretical Model (Stages of Change), there are consistent but modest gender differences in the distribution of men and women across Stages of Change in engaging in regular physical exercise. In general, men tend to be more likely than women to be in later stages (Action/Maintenance), whereas women are relatively more concentrated in earlier stages (Precontemplation, Contemplation, or Preparation), especially in community and low-income samples (20).

The study results presented that there was a statistically significant difference in exercise motivation between gender groups. Further descriptive statistics demonstrated that male participants scored higher on the Exercise Motivation Inventory. This finding implies that male participants have greater readiness to engage in regular physical exercise. Men and women often differ in both the type and strength of their exercise motivation, though patterns vary by age group and cultural context (21). Men tend to report higher intrinsic and performance-oriented motives, such as enjoyment, competition, challenge, social recognition, and improving strength or ability (22).

The study results reveal a statistically significant difference in exercise motivation across the Stages of Change groups. Further post hoc analysis showed that first graders scored higher on the Exercise Motivation Inventory, whereas fourth graders scored lowest. Exercise motivation differs systematically across the Stages of Change, with people in later stages showing more self-determined (intrinsic) motivation and those in earlier stages relying more on extrinsic or amotivated reasons to exercise (11).

The study results reveal a statistically significant difference in Stages of Change across grade groups. Further post hoc analysis exhibited that first graders scored higher on the Stages of Change Scale for Exercise. When comparing these stages across student grade groups (e.g., by academic year or age cohort), differences usually appear in the distribution of stages and proportion of students in more advanced stages (Action/Maintenance vs. Precontemplation/Contemplation) (14, 15).

The study results reveal a statistically significant difference in exercise motivation across grade groups. Further post hoc analysis exhibited that third graders scored higher on the Exercise Motivation Inventory. Exercise motivation among students tends to differ across grade or year-of-study groups, but the pattern is not always linear and depends on age, academic pressure, and context (e.g., school vs. university) (23). Older adolescents (late secondary/pre-university) may exhibit profiles: some become more self-determined (health, fitness, self-improvement), while others shift toward controlled or amotivated types (pressure, obligation, boredom) (24).

Study Limitations

Several limitations should be acknowledged. First, the cross-sectional design precludes causal inference regarding the relationship between motivation and readiness for exercise. Second, height and weight were self-reported, which may introduce reporting bias in BMI calculations. Third, the study was conducted at a single university, which may limit generalizability to other Iraqi or regional institutions. Finally, although mediation effects were proposed, any limitations in the measurement or modelling of mediators should be considered when interpreting indirect effects.

Implications for Health Research

The findings have important implications for health promotion within Iraqi universities. First, motivation-enhancing interventions grounded in behavioural change theory may increase readiness for regular physical exercise. Second, targeted programs for female students may help address gender disparities. Third, early intervention during the first academic year may prevent declines in exercise engagement.

At the policy level, universities should consider expanding accessible recreational facilities and incorporating structured physical activity promotion programs within student support services. Institutional strategies that integrate health promotion into campus culture may improve long-term health outcomes among young adults.

Conclusion

This study demonstrates that university students' readiness to engage in regular physical exercise is significantly associated with age, family socioeconomic status, and BMI, with older students and those with higher BMI showing greater readiness. Exercise motivation showed a moderate positive correlation with readiness,

indicating that motivation plays a central role in behavioural progression. Male students reported higher levels of both readiness and motivation than female students, and significant differences across grade levels suggest that academic progression influences exercise behaviour.

List of Abbreviations

BMI: Body Mass Index
EMI-2: Exercise Motivations Inventory-2
MVPA: Moderate-to-Vigorous Physical Activity
NCDsc: Noncommunicable Diseases
NEAT: Non-Exercise Activity Thermogenesis
PA: Physical Activity
PI: Physical Inactivity
TTM: Transtheoretical Model

Declarations

Ethics Approval and Consent to Participate

Upon submission of the study protocol, ethical approval was sought and granted by the Institutional Review Board (IRB) of the Scientific Committee of the Nursing Faculty, University of Baghdad. The reference number is 33 dated 12/3/2025. The researchers pledge to keep participants' details confidential and to use the collected data without causing any actual or potential harm to study subjects. The study tool was designed to preserve the subject's right to anonymity. Subjects were given the right to freely participate in the study by signing the consent form. Of equal importance, after getting the approval of the Council of Nursing College, University of Baghdad, for the study protocol, and before data collection, the researcher submitted a detailed description of the study, including problem statement, objectives, and questionnaire, to the Ministry of Planning (Central Statistical Organisation)

Consent for publication

All authors gave consent for publication under the Creative Commons Attribution Non-Commercial 4.0 license.

Data Availability

Data supporting the findings of this study will be made available from the corresponding author upon reasonable request, subject to institutional ethical guidelines.

Competing Interests

The authors declare that they have no competing interests.

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Author Contributions

DAA: Conceptualisation, Investigation, Data Curation, Formal Analysis, Software, Writing – Original Draft Preparation, Visualisation, and Project Administration.
QWJ: Methodology, Validation, Supervision, Writing – Review & Editing.

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