

The Influence of Self-Efficacy, Exercise Identity, Outcome Expectations, and Social Support on Physical Exercise Behavior: A Correlational Study

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ABSTRACT

Background: Physical exercise self-efficacy plays a crucial role in promoting regular physical activity, especially among adolescents. This study aimed to (1) evaluate the predictive roles of age, body mass index (BMI), and outcome expectations for exercise on physical exercise self-efficacy, and (2) examine variations in self-efficacy and outcome expectations across different BMI classifications and grade levels. **Methods:** A descriptive predictive correlational design was employed, involving a simple random sample of 450 female high school students from Ramadi City, Anbar Governorate, Iraq. Data were collected using a self-reported questionnaire comprising sociodemographic information, the Stages of Change Scale for Exercise (Short Form), and the Exercise Outcome Expectation Scale. Statistical analysis was performed using SPSS version 27. **Results:** Age and exercising in groups were positively associated with self-efficacy for regular physical activity, while BMI had a negative predictive effect. Significant differences were observed in negative affect, exercise inconvenience, and self-efficacy across grade levels. Additionally, perceptions of rewards varied significantly across BMI categories. **Conclusion:** Older students demonstrated higher self-efficacy for maintaining regular physical exercise. These findings highlight the importance of targeting younger students and those with higher BMI in interventions aimed at enhancing physical activity self-efficacy and promoting positive exercise behaviors.

Keywords: Adolescents, Exercise Identity, Outcome Expectations, Physical Exercise, Self-Efficacy, Social Support

INTRODUCTION

Regarding actions associated to health, Self-Efficacy is frequently understood as the belief that one is capable of performing to carry out the action in the face of different situations or challenges: Self-regulation efficacy, or the ability to direct and inspire oneself to complete tasks that one is capable of performing, is at the core of many functional domains. The question is not if one can perform them infrequently, but rather if one is effective in persuading oneself to perform them consistently in the face of many discouraging circumstances. The Department of Health and Social Care refers to physical inactivity as a "silent killer." Physical activity is defined as any movement that engages the body. The Physical Activity Guidelines for Americans recommend that adults participate in 150 minutes of moderate-intensity physical activity weekly, in addition to two days of muscle-strengthening activities. To combat weight gain, various approaches, including exercise, dietary changes, pharmacological treatments, and surgical interventions, are available [1]. Sedentary behaviors, such as sitting at work, leisure sitting, and watching television, may be associated with overweight and obesity, regardless of physical activity levels. Notably, physical inactivity is identified as the fourth leading risk factor for global mortality, contributing to 6% of deaths worldwide [2]. Regular physical activity is a key element individuals can do for their health. It is evident that making physical activity a priority can significantly impact one's quality of life. By committing to regular exercise, individuals can proactively manage their health and reduce the likelihood of developing chronic conditions. Regular exercise refers to "any planned physical activity (e.g., brisk walking, aerobics, jogging, bicycling, swimming, rowing, etc.) carried out to enhance physical fitness". Such activity needs to

be practiced 3 to 5 times weekly for 20-60 minutes per session. Embracing an active lifestyle is a proactive approach to safeguarding one's well-being and enjoying a longer, healthier life. Being physically active can improve your brain health in that it brings some benefits on brain health that occur immediately after a session of moderate-to-vigorous physical activity (acute effect) including decreased feelings of state anxiety (short-term anxiety), improved sleep, and improved aspects of cognitive function, self-esteem, help manage weight [3]. Consistent participation in vigorous physical exercise could potentially hinder the progression of Alzheimer's disease [4]. An active lifestyle is linked to a reduced risk of the disease and plays a crucial role in helping individuals control their blood sugar and insulin levels. combats health conditions and diseases including coronary heart disease, stroke, metabolic syndrome, high blood pressure, type 2 diabetes, depression, anxiety, dementia, support individuals in developing resilience and coping in a healthy way, preventing many types of cancer, arthritis, osteoarthritis, and falls, strengthen bones and muscles, hip fracture, and improve your ability to do everyday activities, improves mood, boosts energy, promotes better sleep, enhances sexual performance, minimize the risk of early death by up to 30%. Physical exercise can potentially facilitate smoking cessation by mitigating cravings and withdrawal symptoms. And it is known that genetic and metabolic factors directly influence weight gain; however, other factors, such as physical inactivity, an unhealthy diet and psychosocial stress increase the risk of developing obesity and socioeconomic status can influence the high school adolescence's intelligence quotient [5]. Regular aerobic exercise will dramatically alter individuals' heart, metabolism, body, and spirits. Exercise has

been demonstrated in clinical trials to be a promising remedy for anxiety disorders and clinical depression among endurance athletes. Also, Individuals with a body mass index (BMI) of 25-29.9kg/m² are considered overweight, while those with a BMI of 30kg/m² or higher are considered obese [6]. Whereas a BMI of over 30 is not the only sign of obesity, it is a straightforward, low-cost diagnostic that offers healthcare professionals information about a patient's general health [6]. These negative consequences, as well as excessive obesity rates, represent a significant burden on society. Obesity has societal costs that include both direct and indirect expenditures, such as medical costs. Furthermore, the majority of these indirect expenditures occur at work. Obese employees are less productive, have higher absenteeism rates, and are more prone to have workplace injuries [6] and additionally individuals with binge eating disorder eat uncommonly a lot of food in a brief timeframe and feel lost control and blame over these bingeing experiences [7]. Childhood and adolescence are crucial times for building movement abilities, adopting healthy behaviors, and laying the groundwork for long-term health. Engaging in regular physical activity during childhood and adolescence is beneficial for overall health and fitness. Young individuals who engage in regular physical activity have greater likelihood of have a healthy adulthood. Chronic conditions like heart disease, hypertension, type 2 diabetes, and osteoporosis are not typically developed by children and adolescents. However, studies indicate that obesity and other factors that put individuals at risk for these conditions, like high insulin levels, elevated blood lipids, and high blood pressure, are becoming more prevalent among children and adolescents. Bandura [8] defined Self-Efficacy as what individuals believe about their ability to exert a degree of control over the way they function and over Environmental occurrences refer to events or situations that impact the natural world. Self-Efficacy is a concept that is specific to particular contexts, focusing on an individual's belief in their capacity to perform necessary actions to achieve specific outcomes, such as resisting the temptation to smoke. According to Self-Efficacy theory, a person's confidence in their ability to undertake challenging behaviors, like quitting smoking, significantly affects their success in accomplishing those behaviors. Individuals who possess a strong belief in their abilities are more inclined to make attempts and persist, whereas those lacking such confidence are less likely to exert effort or may abandon the behavior more quickly [9]. Additionally, Physical Activity (PA) encompasses any movement of the body produced by skeletal muscles that results in energy expenditure [10]. Outcome expectations play a vital role in self-efficacy theory, as they encompass individuals' beliefs that engaging in specific behaviors will yield positive results, such as a decreased risk of cardiovascular issues. Bandura's [8] theory emphasizes the importance of the relationship between self-efficacy and outcome expectations in predicting behavior. For individuals to effectively adopt a health behavior, they must believe that the behavior will lead to a desirable outcome and that they are capable of executing the behavior successfully. According to Self-Efficacy Theory, individuals are more likely to adhere to various health recommendations, including following a smoking cessation program, managing exercise routines, controlling diabetes, and maintaining HIV medication regimens. For example, research by Shiffman et al. [11] examined the link between self-efficacy and smoking relapse. The findings indicated that individuals who initially lapsed in their smoking cessation efforts were more likely to remain abstinent if they had high self-efficacy levels. In contrast, those with lower self-efficacy were more susceptible to relapse

[9]. The connection between social support and exercise adherence can be mediated by the level of exercise commitment. This commitment reflects the psychological mindset of individuals who engage in physical exercise, marked by their willingness and determination to pursue physical activity. This is evidenced by their emotional bond with exercise and their intention to continue participating in physical activities [12]. Social support plays a significant role in influencing a person's overall health and well-being [13]. Exercise commitment is widely regarded by many scholars as a crucial indicator and prerequisite for the enduring and consistent engagement in physical activity [14, 15]. Furthermore, research has demonstrated that social constraints have the potential to compromise individual's commitment to physical activity, whereas social support can enhance an individual's commitment to exercise [12]. Social support from friends and family is found to be a key factor for regular exercise behavior [16, 17]. could motivate students to maintain exercising [18] and additionally Enhance the knowledge, attitudes and behaviors of adult related to periconceptional health [18]. The elements that anticipate adherence involve personal characteristics and environmental factors that are resistant to modification, such as age and socioeconomic factors. These elements also encompass health beliefs that are more amenable to change. Personal characteristics, including age, gender, and personality, and environmental factors like social support, income, and cultural norms, are key determinants of adherence [19]. Initially, personality was a primary factor in relation to adherence, but emotional factors and personal beliefs are now considered more important in understanding adherence. The relationship between age and adherence is not straightforward. Assessing adherence in children is difficult because the focus is on the parent's adherence rather than the child's [13]. As individuals transition from childhood to adolescence, they assume greater responsibility for complying with medical treatment plans, a trend that persists into their adult years. However, elderly individuals might encounter challenges that hinder their ability to comply with prescribed treatments, including issues with memory retention, declining physical well-being, and complex medication schedules. [16, 17]. These developmental issues contribute to a complex relationship between age and adherence. This study is the first in Iraq, Middle East, and worldwide that sheds the light on physical exercise Self-Efficacy, exercise identity, exercise outcome expectation, and social support for exercise behaviors in one study. This study aims to (1) identify whether students' age, body mass index, exercise identity, outcome expectation for exercise, and social support for exercise behaviors can predict their physical exercise Self-Efficacy, and (2) investigate the differences in physical exercise Self-Efficacy, exercise identity, outcome expectation for exercise, and social support for exercise behaviors between the groups of BMI classes and grade.

Method

Design

A descriptive predictive correlational design was used to guide this study.

Sample and Sampling

The study included a simple random sample of high school female students. The sample size was calculated using G*power software, version 3.1.9.2 based on a moderate effect size (0.25), an alpha error

probability of 0.05, a power of 0.95, and 10 groups, the recommended sample size would be 390. The final sample size is 450.

Measures

The Exercise Self-Efficacy Scale (ESES)

The ESES measures persons' perceived ability to overcome each facilitating or constraining condition [19]. Particularly, it examines the extent to which individuals are confident to practice physical exercise when other things impede them [20]. The Exercise Self-Efficacy Scale includes the Negative Affect subscale (3 items), the Excuse Making subscale (3 items), Must Exercise Alone subscale (3 items), the Inconvenient to Exercise subscale (3 items), the Resistance from Others subscale (3 items), and the Bad Weather subscale (3 items). These items are measured on a 5-point Likert scale of 1 for (Not at all confident), 2 for (Somewhat confident), 3 for (Moderately confident), 4 for (Very confident), 5 for (Completely confident). The total score for this scale ranges 6-30 with a higher score indicates greater Self-Efficacy. The Cronbach's alpha for Negative Affect subscale (.852), the Excuse Making subscale (.829), Must Exercise Alone subscale (.869), the Inconvenient to Exercise subscale (.773), the Resistance from Others subscale (.853), and the Bad Weather subscale (.837).

The Stages of Change Scale for Physical Exercise (Continuous Measure)

The Stages of Change Scale for Physical Exercise (Continuous Measure) which represents sequential stages through which individuals proceed to affect lasting behavior change [21]. These stages include Precontemplation Non-Believer (people do not intend to take action in the foreseeable future "usually defined as within the next 6 months") which includes 4 items, Precontemplation Believer which includes 4 items, Contemplation (individuals engage in cognitive processes) which includes 4 items, Preparation (individuals intend to adopt a new behavior in the immediate future, usually defined as within the next month) which includes 4 items, Action (individuals have made specific overt modifications in their lifestyles within the past 6 months) which includes 4 items, and Maintenance (individuals still work to prevent relapse, but they do not need to apply change processes as frequently as do people in the action stage) which includes 4 items.

Exercise Identity Scale (EIS)

The EIS [22] measures persons' salience of identifying exercise as a fundamental part of the concept of self. The Exercise Identity Scale includes nine items that are measured on a 5-point Likert scale of 1 for (Strongly disagree), 2 for (Disagree), 3 for (Not decided), 4 for (Agree), and 5 for (Strongly agree). The total score ranges between 9-45 with a higher score indicates better exercise identity. The internal consistency of this scale is excellent (Cronbach's Coefficient alpha was .94) [22].

Exercise Outcome Expectation Scale

The Exercise Outcome Expectation Scale [23] that measures the specific benefits of exercise which includes nine items that are measured on a 5-point Likert scale of 1 for (Strongly disagree), 2 for (Disagree), 3 for (Not decided), 4 for (Agree), and 5 for (Strongly agree). The total score ranges between 9-45 with a higher score

indicates greater benefits of physical exercise. The internal consistency of this scale was very good (Cronbach's Coefficient alpha was .89) [23]. Other studies confirmed the reliability of the Exercise Outcome Expectation Scale in that the Cronbach's alpha was 0.96, 0.83, 0.73 [24].

The Social Support for Exercise Behavior Scale (SSEBS)

The SSEBS is a part of The Social Support for Diet and Exercise Behaviors Scale which identifies interpersonal behaviors related to exercise habit [25]. This scale involves Friends' Support for Exercise Habits subscale which includes five items that are measured on a 5-point Likert scale of 1 for (Never), 2 for (Rarely), 3 for (Sometimes), 4 for (Often), 5 for (Often always). The total score of this subscale ranges between 5-25 with a higher score indicates greater friend's support for exercise habits. The Friends' Support for Exercise Habits subscale demonstrated very good internal consistency reliability (Exercising together 0.84). It also includes The Family Support for Exercise Habits that includes the Participation and Involvement Subscale which includes 12 items that are measured on a 5-point Likert scale of 1 for (Never), 2 for (Rarely), 3 for (Sometimes), 4 for (Often), 5 for (Often always). The total score of this subscale ranges between 12-60 with a higher score indicates greater friend's support for exercise habits. The Participation and Involvement Subscale demonstrated an excellent internal consistency reliability (Cronbach's alpha 0.91). The Family Support for Exercise Habits includes also the Rewards and Punishments Subscale which includes 3 items that are measured on a 5-point Likert scale of 1 for (Never), 2 for (Rarely), 3 for (Sometimes), 4 for (Often), 5 for (Often always). The total score of this subscale ranges between 3-15 with a higher score indicates greater Rewards and Punishments related to exercise habits. The Rewards and Punishments Subscale demonstrated an average internal consistency reliability (Cronbach's alpha 0.61). The Social Support for Exercise Behavior Scale displayed an excellent content validity (The Content Validity Ratio is 0.94) [26]. And Social support is considered as more beneficial coping methods as reducing stress, lowering social exhaustion level, and increase ability for improving mood [1].

Results

The mean age is 17.48 ± 1.49 ; less than a half age 17-18-years ($n = 208$, 46.2%), followed by those who age 15-16-years ($n = 125$, 27.8%), and those who age 19-20-years ($n = 117$, 26.0%). The study results reveal that more than a half are within normal weight-to-height proportion ($n = 240$, 53.3%), followed by those who are overweight ($n = 160$, 35.6%), those who have obesity class I ($n = 40$, 8.9%), those who are underweight ($n = 7$, 1.6%), those who have obesity class II ($n = 2$, 0.4%), and one who has obesity class III ($n = 1$, 0.2%). The stepwise regression model displays that participants' age and exercising together positively predict more their Self-Efficacy to engage in regular physical exercise (p -value = .010, .032) respectively. On the other hand, participants' BMI negatively predicts their Self-Efficacy to engage in regular physical exercise (p -value = .021).

The study results reveal that there are statistically significant differences in Negative Affect, Inconvenient to Exercise, and overall Self-Efficacy among grade groups (p -value = .000, .035, .019) respectively. The study results display that there is a statistically significant difference in rewards among BMI groups (p -value = .001)

Table 1: Stepwise Regression Model

		Coefficients ^a		Standardized Coefficients			
Model		Unstandardized Coefficients		Beta	t	Sig.	
		B	Std. Error				
1	(Constant)	38.813	6.580		5.899	.000	
	Age	.869	.324	.125	2.682	.008	
	BMI	-.305	.132	-.108	-2.316	.021	
2	(Constant)	35.909	6.992		5.136	.000	
	Age	.837	.324	.120	2.582	.010	
	BMI	-.312	.131	-.110	-2.380	.018	
	Outcome Expectations for Exercise	-.046	.067	-.032	-.690	.491	
	Exercising together	.248	.115	.107	2.151	.032	
	Participation and involvement	-.014	.063	-.012	-.229	.819	
	Rewards	.311	.178	.085	1.752	.080	

a. Dependent Variable: Self-Efficacy

Table 2: Differences in Self-Efficacy Subdomains Among Grade Groups

		ANOVA				
		Sum of Squares	df	Mean Square	F	Sig.
Negative Affect	Between Groups	248.159	2	124.079	10.096	.000
	Within Groups	5493.399	447	12.289		
	Total	5741.558	449			
Excuse Making	Between Groups	5.627	2	2.813	.297	.743
	Within Groups	4236.738	447	9.478		
	Total	4242.364	449			
Must Exercise Alone	Between Groups	14.323	2	7.161	.744	.476
	Within Groups	4305.108	447	9.631		
	Total	4319.431	449			
Inconvenient to Exercise	Between Groups	62.699	2	31.349	3.390	.035
	Within Groups	4133.381	447	9.247		
	Total	4196.080	449			
Resistance from Others	Between Groups	26.649	2	13.325	1.587	.206
	Within Groups	3752.231	447	8.394		
	Total	3778.880	449			
Bad Weather	Between Groups	34.045	2	17.023	1.541	.215
	Within Groups	4938.186	447	11.047		
	Total	4972.231	449			
Self-Efficacy	Between Groups	845.352	2	422.676	3.996	.019
	Within Groups	47282.873	447	105.778		
	Total	48128.224	449			

df: Degree of freedom, F: F-statistics, Sig.: Significance

Table 3: Differences in social support for exercise among BMI groups

		ANOVA				
		Sum of Squares	df	Mean Square	F	Sig.
Participation and involvement	Between Groups	42.093	5	8.419	.117	.989
	Within Groups	31851.427	444	71.737		
	Total	31893.520	449			
Rewards	Between Groups	168.260	5	33.652	4.348	.001
	Within Groups	3436.460	444	7.740		
	Total	3604.720	449			
Family Social Support	Between Groups	120.779	5	24.156	.259	.935
	Within Groups	41407.701	444	93.261		
	Total	41528.480	449			

Df: Degree of freedom, F: F-statistics, Sig.: Significance

Discussion

The stepwise regression model displayed that participants' age positively predicts more their Self-Efficacy to engage in regular physical exercise. This finding implies that the older the student, the greater the Self-Efficacy to engage in regular physical exercise. This finding could be explained as older students could have more information about the benefits of engaging in regular physical exercise and the consequences of physical inactivity and/or sedentary lifestyle behavior. Hussien et al. [27] concluded that there was a moderate association between physical activity and Self-Efficacy to overcome several barriers to physical activity. The stepwise regression model displayed that exercising together positively predict more their

Self-Efficacy to engage in regular physical exercise. This finding implies that the greater the social support for exercising together, the greater the Self-Efficacy to engage in regular physical exercise. This finding goes in line with that obtained by Tian and Shi [28] who concluded that social support can positively predict exercise adherence among college students. On the other hand, participants' BMI negatively predicts their Self-Efficacy of enrolling in regular physical exercise. This finding implies that the lower the BMI, the greater the Self-Efficacy of enrolling in regular physical exercise. This finding goes parallel to that obtained by Clum et al. [29] who concluded that BMI significantly inversely associates with exercise Self-Efficacy. Consistently, Brooks et al. (2018) concluded that there was a significant difference in Self-Efficacy for exercise among BMI groups.

The study results reveal that the difference in Negative Affect was significant among grade groups. Further post hoc analysis demonstrates that 12th graders enjoy greater Self-Efficacy of enrolling in regular physical exercise in terms of Negative Affect than 11th graders and 10th graders. This finding could be explained as 12th graders could have much information of the value of engaging in regular physical exercise as they obtained this information through their academic courses compared to 11th and 10th graders even when they are in a negative effect. The study results reveal that the difference in Inconvenient to Exercise was statistically significant among grade groups. Further post hoc analysis displays that 12th graders enjoy greater Self-Efficacy of engaging in regular physical exercise when they find it inconvenient to exercise than 11th graders and 10th graders. This finding could be explained as 12th graders supposedly have much information of the value of engaging in regular physical exercise to the extent that they maintain exercising regularly even when they find it inconvenient to exercise. The study results reveal that the difference in overall Self-Efficacy was statistically significant among grade groups. Further post hoc analysis exhibits that 12th graders enjoy greater overall Self-Efficacy of enrolling in regular physical exercise than 11th graders and 10th graders. This finding could be explained as 12th graders could have

much information of the value of engaging in regular physical exercise as they obtained this information through their academic courses compared to 11th and 10th graders. The study results displayed that the difference in rewards was statistically significant among BMI groups. Further post hoc analysis reveals that participants who are underweight enjoy greater social support from family in terms of rewards and punishment. This finding could be explained as family members could encourage these participants to engage in regular physical exercise since they believe that regular exercising can enhance their physique and overall health. Adolescent is a critical stage in the adoption of behavior relevant to health [30]. The current study involved the limitation of the study data were subjectively collected using a self-reported instrument. The study involves a number of implications including the reality that this study is the first worldwide that integrates physical exercise Self-Efficacy, exercise identity, exercise outcome expectation, and social support for exercise behaviors in one study. On the other hand, there are a number of factors that can influence individuals' inclination to regular physical exercise including parents' readiness to engage in regular physical exercise, parents' social support for healthy eating habits that the researchers did not consider and future researchers need to consider.

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