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Original Research

Effects of a Personalized Fitness Program Provided by Undergraduate Exercise Science Students on Attitudes Toward Exercise, Mental Health, and Quality of Life

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Abstract

International Journal of Exercise Science 18(4): 1334-1343, 2025. https://doi.org/10.70252/IYNS6043 Personalized fitness training is designed to improve physical health and fitness, but may also promote mental health and well-being. The purpose of this study was to determine whether there are positive psychological outcomes for clients participating in a community-based personalized fitness program led by undergraduate Exercise Science students. A total of 44 participants completed a battery of psychological scales both before and after participation in a 12-week university-sponsored personalized fitness training program. Psychological measures included the Exercise Attitudes Scale, Self-Efficacy Scale for Exercise, Short Warwick-Edinburgh Mental Well-Being Scale, Health Status Questionnaire, and Visual Analog Scale for quality of life. In addition to expected gains in various biometric indicators of physical fitness, we observed significant improvements in clients' attitudes toward exercise, mental well-being, perceived health, and quality of life. Effect sizes were generally in the small to medium range (0.19 to 0.58) across 15 psychological measures. Results provide convincing evidence of the mental health benefits associated with participation in personalized fitness training. Our university-sponsored fitness training program can serve as a model program for both engaging undergraduate students in authentic fitness training experiences and promoting community health and wellness.

Keywords: Exercise science, fitness training, physical activity, psychology

Introduction

The Exercise Science program at our university provides opportunities for community members to receive personalized fitness training administered by undergraduate student trainers and supervised by university faculty. This service-learning component of our curriculum was designed to provide opportunities for students to utilize concepts of exercise progression and regression, educate clients on basic nutrition, and practice skills in behavior modification. In a previous study, it was shown that this experience increases students' self-efficacy in these areas.[1]

Community clients participating in the fitness training program have consistently shown improvements in biometric indicators including cardio-respiratory functioning, flexibility, balance, and strength. Many clients have also reported psychological and quality of life benefits including improved attitudes toward exercise, gains in confidence about exercise technique, and increased mental well-being. In their thematic analysis of client reflections on the fitness training experience, Cleveland and Peterson[1] identified four themes: (1) better health metrics, contributing to both physical and psychological well-being; (2) improved confidence in exercise technique and using exercise to improve overall health; (3) more positive attitude about engaging in exercise and physical activity; and (4) helping students to learn how to use their academic preparation and motivational techniques to provide a high quality training program for clients.

There is a plethora of research showing the benefit of exercise on mental health in all age groups. In a review done by Matta Mello Portugal et al,[2] positive responses to regular physical exercise were shown in the areas of enhanced functional capacity, increased autonomy and improved self-esteem, improvement in mood, and adherence to an exercise program. This review also showed increased synthesis and release of neurotransmitters and neurotrophic factors, which may be associated with neuroplasticity. In a recent systematic review by Huang and Wong,[3] it was shown that physical activity can have a positive effect on mental health that varies by intensity, duration, and modality of exercise, with moderate intensity and 30 minutes of exercise leading to the most positive emotions.

The purpose of the current study was to examine whether the psychological benefits of participating in our fitness training program could be validated quantitatively using established psychological scales. Based on previous research, we predicted gains in perceived health status, mental well-being, attitudes toward exercise, exercise self-efficacy, and overall quality of life.

While the benefits of physical exercise training have been well-established in the research literature,[4] the primary focus of past research has been on physical health and fitness. The current study aims to contribute to a growing body of knowledge concerning the mental health benefits of community and/or workplace physical activity programs.[5]

Methods

Participants

An *a priori* power analysis conducted using G*Power3[6] indicated that a sample size of 41 participants would be needed to detect an effect size of d = 0.4 with 80% power using a dependent samples t-test with a = .05 and a one-tailed test. Our effect size estimate was based on previous research showing that physical activity tends to have a moderate effect (d = 0.4 – 0.6) on mental health and quality of life outcomes.[7–9]

Participants in our study were 72 adult community members who completed a 12-week personalized fitness training program on the campus of Southwest Minnesota State University (SMSU) in Marshall, Minnesota for the first time during the six semesters between Fall 2022 and Spring 2025. Individuals participating during this time period who had previously completed

the program (repeat clients) were excluded from our study. Of the 72 first-time participants, 44 completed the psychological scales survey both before and after completion of the program. One participant was deemed to be an outlier based on an extremely low score reported on one of the scales and was excluded from further analysis. Thus, our final sample for this study consisted of 43 adults (7 males and 36 females), with an average age of 40.2 years. The materials and procedures used in this study were approved by the SMSU Institutional Review Board. All participants provided informed consent. This research was carried out fully in accordance with the ethical standards of the *International Journal of Exercise Science*.[10]

The fitness training program is a collaboration between SMSU and various companies in the community, including the Schwan's Company, Runnings Corporation, Ralco Nutrition, and others. Faculty and staff members at SMSU are also eligible to participate in the program. This program was designed to support our "service-learning model of education," in which students in their last two semesters of their BS Exercise Science degree program work directly with community clients.

Protocol

Participants in the study completed a comprehensive fitness assessment administered by Exercise Science students both at the beginning and end of their 12-week fitness training. At initial client intake, the participants were asked to identify biological sex at birth, and their preferred pronouns. The biometric data collected in this assessment were as follows: vital signs including heart rate, respirations, blood pressure (Solventum Corporation. 3M™ Littmann® Lightweight II S.E. Stethoscope. St. Paul, MN: Solventum Corporation [2018]; Omron Healthcare, Inc. Omron Blood Pressure Monitor. Hoffman Estates, IL: Omron Healthcare, Inc. [2022]), height and weight, body fat composition using skin fold calipers (Beta Technology, Inc. Lange Skinfold Caliper. Chicago, IL: Beta Technology, Inc. [2016]) and also a bioelectric impedance scale (Tanita Corporation. Tanita Bioelectrical Impedance Scale. Tokyo, Japan: Tanita Corporation [2015]), waist to hip ratio, muscle endurance tests including push-up (regular or modified), plank test (regular or with modification), flexibility tests including sit and reach (Baseline® Sit n' Reach® Trunk Flexibility Box. Fabrication Enterprises Inc., PO Box 1500, White Plains, NY 10602, USA) and shoulder mobility tests, balance tests utilizing the Y Balance test™ (Functional Movement Systems, Inc. Y Balance Test Kit. Chatham, VA: Functional Movement Systems, Inc. [2022]) and cardiovascular testing utilizing the Rockport one mile walk test. All fitness assessment measures are taught to students using the American College of Sports Medicine (ACSM) guidelines, using ACSM's Fitness Assessment Manual, 6th ed. Lippincott Williams & Wilkins [2022].

In addition to the fitness assessment, and again at both the beginning and end of their 12-week fitness training, participants were asked to complete a psychological scales survey. The scales included in the survey instrument were as follows: the Exercise Attitudes Scale, the Self-Efficacy Scale for Exercise, the Short Warwick-Edinburgh Mental Well-Being Scale, the Health Status Questionnaire, and a Visual Analog Scale for reporting overall quality of life. All scales are freely accessible in the research literature, some were adapted for the purposes of our study as noted in the descriptions below.

Exercise Attitudes Scale (EAS): This 8-item measure consists of a collection of 7-point bipolar adjective scales asking individuals whether they believe that exercise is: important/unimportant, harmful/beneficial, wise/foolish, unhealthy/healthy, enjoyable/unenjoyable, boring/interesting, pleasant/unpleasant, and stressful/relaxing. Our version of this scale was based on similar measures used in the research literature.[11,12] Responses were coded so that higher numbers represent more positive attitudes (reverse coding used for the important/unimportant, wise/foolish, enjoyable/unenjoyable, and pleasant/unpleasant pairs). Responses were used to compute an overall measure of attitude toward exercise (average of all eight pairs) as well as measures of the instrumental (average of first four pairs) and affective (average of second four pairs) components of exercise attitude. The instrumental subscale emphasizes the purpose being served by exercise whereas the affective subscale emphasizes the emotional aspects of exercise.

Self-Efficacy Scale for Exercise (SEE): This 9-item measure[13] asks individuals to rate their confidence in their ability to continue exercise in the face of barriers such as bad weather, feeling tired, or not enjoying the activity. Response options range from 0 (not confident) to 10 (very confident) and a total score was calculated by summing the responses for the nine items. Higher scores indicate greater exercise self-efficacy.

Health Status Questionnaire (HSQ-12): This 12-item questionnaire[14] measures the perceived health status of individuals across a broad range of health states including physical functioning, social functioning, and emotional well-being. The coded values for each of the twelve questions were used to compute scores on eight different health dimensions: health perception, physical functioning, role-physical, role-mental, social functioning, bodily pain, mental health, and perceived energy. All twelve scores were summed to compute an overall health status score with higher scores indicating a more positive health status.

Short Warwick-Edinburgh Mental Well-Being Scale (SWEMWBS): This 7-item scale[15] with Likert-style responses (1=None of the time, 5=All of the time) was designed to assess positive aspects of mental health such as feeling optimistic about the future, dealing with problems well, feeling relaxed, and feeling close to other people. The scale used in this study is a shortened version of the original 14-item Warwick-Edinburgh Mental Well-Being Scale.[16] Participant responses on the seven items were summed to compute an overall measure of mental well-being, with higher scores indicating a higher level of mental well-being.

Visual Analog Scale (VAS): This is a single item, global quality of life indicator asking individuals to rate their quality of life TODAY on a 0 ("Worst possible quality of life") to 100 ("Perfect quality of life") linear scale. Our version of this instrument is based on similar single-item measures used in other studies to assess quality of life.[17]

The Exercise Science community fitness program at SMSU was developed in 2014 to serve a need for students to develop self-efficacy in fitness assessment, exercise prescription, progression and regression of exercise based on individual client needs, and client counseling in goal setting, behavior modification and exercise adherence. This program was also designed to support our "service-learning model of education," in which students in their last two

semesters of their BS Exercise Science degree program work directly with community clients. Students participate twice in the fitness training program as part of the Exercise Science curriculum: for EXSC 490, Exercise Prescription, and EXSC 480, Principles of Training and Conditioning. These courses are the culmination of their Exercise Science curriculum along with Capstone Research. The prerequisites for these courses are as follows: Introduction to Exercise Science, Anatomical Kinesiology, Biomechanics of Human Motion, Nutrition, Nutrition and Exercise, Exercise Physiology, Research Methods, Community and Corporate Wellness, and Health Promotion. Students also must complete a Fitness Assessment course and have a minimum of 75 credits earned. Having these courses completed then allows students to take what they have learned in their lower-level exercise science curriculum and put it into practical application with the direction of the faculty. The first service-learning experience typically is when they take Exercise Prescription (Fall offering), and their second service-learning experience is when they take Principles of Training and Conditioning (Spring offering), but this may be different depending on their curriculum plan to completion of their degree. They can also elect to participate one additional semester as part of a pre-professional practicum directed studies experience. Students in EXSC 350, Exercise Physiology, can elect to "shadow" the upperclassmen as part of their preparation for the service-learning courses if they choose. Potential community and/or clients from the workplaces we have partnerships with (Southwest Minnesota State University, Runnings Corporation, RALCO Ag and The Schwan Food Company) are sent an invitation to participate in the semester-long program from their employer's Human Resource department or via an announcement from the program director at SMSU. Participation is voluntary. Depending on the employer, the program is either free to the employee or the employee gives a nominal donation to participate. The number of participants per semester is dependent on the number of students enrolled in the service-learning courses.

The Exercise Science program has its own fitness center, which allows Exercise Science students to train clients in a controlled setting. The students are also allowed to use it for their own personal fitness, and are encouraged to practice exercise prior to client instruction. The SMSU Exercise Science fitness center has treadmills, stationary cycles, elliptical machines, and one upper body ergometer (Vision Fitness. *Vision Fitness Equipment*. Cottage Grove, WI: Vision Fitness [2014]). Strength training equipment includes one squat rack (Life Fitness. *Hammer Strength Equipment*. Rosemont, IL: Life Fitness [date unknown]), two functional trainers (Body-Solid, Inc. *Body-Solid Fitness Equipment*. Forest Park, IL: Body-Solid, Inc. [2016]), 4 TRX units (TRX Training. TRX Suspension Training System. Delray Beach, FL: TRX Training), dumbbells, kettlebells, sandbags, weighted bars, bands and battling ropes. Balance equipment consists of Airex pads (Airex AG. *Airex Balance Pad*. Sins, Switzerland: Airex AG; [date unknown]) and BOSU balls (BOSU Fitness, LLC. *BOSU Balance Trainer*. Ashland, OH: BOSU Fitness, LLC [date unknown]). The program tries to continue to offer equipment to students that they would use in their careers.

Clients who elect to participate in the program complete a fitness assessment at the start of the program and then are trained by the students two times per week with the students writing an individualized exercise prescription (IEP) under the direction of the faculty teaching the respective course.

The IEP consists of a warm up, cardiovascular training, strength training, balance training, flexibility/mobility training, cool down and summary of each session with input from the client. The instructor assists and approves each IEP prior to the student using it for their training session. The IEP is developed by the instructor for weeks 1 and 2, where the students provide an orientation to the fitness center to each client, assess clients' movement patterns, and begin to learn how their client exercises based on monitoring of heart rate, foundational movement patterns, and monitoring their client for safety. In week 2, the instructor will help the student use their critical thinking skills to manipulate the exercise variables. In weeks 3-10, the instructor continues to guide students through the process of exercise progression and regression when needed, while instructing each student in how to properly manipulate each variable based on how the client is responding, and based on how they also respond with target heart rate, rate of perceived exertion (RPE), and movement patterns with all exercises.

The program concludes with a post program fitness assessment, followed by a wrap-up meeting with the student, where all pretest and posttest data are reviewed with the client by that client's student trainer. The student trainer also provides a home exercise program at the end of the semester, which is based on the post fitness assessment data analysis, the student trainer's prescription for continued exercise, and the continued goals of the client. Upon completion of the program, both student and client complete a survey asking them to reflect on the training experience. A more comprehensive description of the community fitness program can be found in Cleveland and Peterson[1] including an explanation of how the program is integrated with the Exercise Science curriculum at SMSU.

Statistical Analysis

Paired-samples *t*-tests were conducted in SPSS (Version 29.0.1.0) to compare pretest and posttest scores on all the biometric and psychological measures used in our study. One participant was unable to complete the fitness assessment due to disability and thus the biometric analysis included only 42 participants. A one-tailed significance level of .05 was used for all tests on the psychological measures based on our prediction that these measures would all show an increase in scores. A two-tailed significance level of .05 was used for the biometric measures. Cohen's *d* was used to compute effect sizes for the differences between pretest and posttest scores (0.2 = small, 0.5 = medium, 0.8 = large).

Results

Descriptive statistics and *t*-test results for the psychological scales and subscales are summarized in Table 1. For the EAS scale, participants reported significantly more positive attitudes toward exercise after completion of the fitness program ($p = 0.031$). There was a notable increase for both the instrumental and affective subscales, although the increase was statistically significant only for the instrumental scale ($p = 0.008$). There was also a similar increase from pretest to posttest for exercise self-efficacy as measured by the SEE scale, although this increase did not reach statistical significance ($p = 0.071$). For the HSQ-12 scale, we found a significant increase from pretest to posttest in overall health ($p < 0.001$), with significant increases on several of the subscales including health perception ($p = .017$), health effects on daily physical activities

(role physical, p = 0.026), health effects on daily mental activities (role mental, p = 0.005), and perceived energy (p = 0.001). The improvement in bodily pain (note that higher scores indicate less reported pain) was nearly significant (p = 0.052). Our data also indicate a significant increase in mental well-being (as measured by the SWEMWBS scale) from pretest to posttest (p = 0.005), as well as an approximately 4.5% increase in overall quality of life (as measured by the VAS scale), which was also statistically significant (p = 0.011).

Table 1. Pretest and posttest results for psychological scales

Measure	Pretest *M* (*SD*)	Posttest *M* (*SD*)	*t*	*p*	Cohen's *d*
EAS	5.78 (0.93)	5.96 (0.78)	-1.91	.031	0.29
Instrumental	6.17 (0.84)	6.44 (0.78)	-2.51	.008	0.33
Affective	5.17 (1.27)	5.33 (1.05)	-1.31	.099	0.20
SEE	5.30 (2.04)	5.71 (2.01)	-1.50	.071	0.23
SWEMWBS	27.60 (5.08)	29.12 (3.97)	-2.73	.005	0.42
HSQ	78.64 (13.91)	82.99 (12.45)	-3.81	<.001	0.58
Health perception	64.42 (23.91)	69.77 (20.24)	-2.20	.017	0.34
Physical functioning	91.09 (21.00)	94.46 (16.53)	-1.22	.114	0.19
Role physical	85.47 (23.78)	92.44 (18.85)	-2.00	.026	0.31
Role mental	79.30 (24.61)	88.95 (17.24)	-2.69	.005	0.41
Social functioning	86.63 (22.06)	90.12 (18.21)	-1.23	.112	0.19
Bodily pain	79.77 (17.49)	83.26 (15.69)	-1.67	.052	0.25
Mental health	71.78 (18.56)	73.84 (17.28)	-1.04	.153	0.16
Perceived energy	59.53 (20.70)	66.51 (20.34)	-3.04	.001	0.46
VAS	80.70 (11.51)	84.37 (10.09)	-2.38	.011	0.36

Note: One-sided p values reported for all measures (n = 43)

Descriptive statistics and *t*-test results for the biometric measures are summarized in Table 2. Our data indicate a significant improvement from pretest to posttest on many of the biometric measures, including systolic blood pressure, sit and reach flexibility, and performance on the Y-balance test. Participants also exhibited a significant increase in plank duration and push-up repetitions at posttest as compared to pretest. There was a significant decrease in Rockport time, indicating a faster walking speed after completion of the fitness program.

Discussion

As expected, and consistent with the goals of our fitness training program, participants in this study exhibited improved physical fitness after completion of the 12-week program. Their diastolic blood pressure was lowered, and they showed significant gains in balance, flexibility, and cardiovascular functioning. They were able to perform more push-ups, longer planks, and complete a one-mile walk in shorter time. These results are consistent with the findings reported by Prieske et al[4] in their systematic review of physical exercise training in the workplace.

In addition to the clear gains in physical fitness as observed in the biometric measures, our results for the psychological measures provide convincing evidence of the mental health benefits associated with participation in personalized fitness training. Over a 12-week period, we found

Table 2. Pretest and posttest results for biometric measures

Measure	Pretest *M* (*SD*)	Posttest *M* (*SD*)	*t*	*p*	Cohen's *d*
Heart Rate	72.26 (13.64)	71.36 (12.46)	0.69	.496	0.11
Respirations	15.07 (3.26)	14.93 (3.25)	0.37	.715	0.06
Weight	85.73 (20.13)	86.06 (20.28)	-1.15	.257	0.18
Skinfold	28.55 (7.59)	28.77 (7.35)	-0.39	.697	0.06
BMI	29.43 (7.09)	29.52 (6.91)	-0.69	.496	0.11
Systolic BP	127.24 (9.84)	123.19 (7.65)	2.91	.006	0.45
Diastolic BP	76.64 (12.27)	77.62 (6.78)	-0.48	.631	0.08
Push-Up	12.79 (8.22)	17.79 (9.69)	-6.02	<.001	1.38
Modified Push-Up	11.76 (7.40)	17.48 (10.10)	-3.62	<.001	0.79
Plank	64.12 (32.42)	88.16 (52.14)	-5.31	<.001	0.80
Sit and Reach	28.32 (9.72)	30.63 (9.26)	-5.28	<.001	0.81
Shoulder Mobility Right	7.68 (10.31)	6.88 (9.38)	1.27	.211	0.20
Shoulder Mobility Left	8.81 (9.16)	8.16 (9.08)	1.13	.267	0.17
Y-Balance Right	93.51 (13.32)	97.18 (10.58)	-2.94	.005	0.45
Y-Balance Left	93.80 (12.22)	96.23 (10.27)	-2.25	.030	0.35
Rockport Time	925.03 (185.37)	866.45 (142.47)	2.28	.028	0.35
Rockport Pulse	131.29 (19.72)	137.50 (18.28)	-2.11	.041	0.32
VO_2Max	33.88 (11.31)	34.42 (10.82)	-0.87	.391	0.13

Note: n = 42 for all measures except Push-Up (n = 19) and Modified Push-Up (n = 21); reported p values are two-sided

statistically significant improvement in clients' attitudes toward exercise, mental well-being, perceived health status, and overall quality of life. Effect sizes were generally in the small to medium range (0.19 to 0.58) across the 15 psychological measures used in our study. These findings are consistent with the growing body of evidence showing that exercise and physical activity affect mental health and well-being positively in the general population[2,3] and may even reduce symptoms of depression, anxiety and other psychological disorders in both healthy individuals and clinical patients.[18,19] Accordingly, Sharma et al[20] advise mental health professionals to consider the importance of exercise for improved sleep, stress relief, improvements in mood, increased energy, and increased interest in sex along with the physical health benefits.

A limitation of our study is that in the service-learning model we use at SMSU there is no method of including a control group. Thus, the observed gains in physical fitness and mental health cannot be definitively attributed to participation in the fitness program as opposed to other outside factors. Furthermore, the participants in our study had already enrolled in the fitness program and were therefore in the Action stage of the Transtheoretical Stages of Change model.[21] Thus, they were already motivated to complete an exercise training program and perhaps predisposed to the potential psychological benefits that might result from their participation. Therefore, our results might generalize only to those individuals who are motivated to improve their physical fitness.

Another limitation of this study is that it only includes first-time participants Many of our fitness program participants find it to be a valuable experience and thus re-enroll for more than one semester. Data obtained from repeat clients were not included in the data analysis. Future research that includes data for repeat clients may provide insight regarding the benefits of continued participation in exercise training. As mentioned earlier, clients are provided with an individualized plan for continued exercise upon completion of the fitness program. It would be useful to perform a follow-up assessment (e.g., at 6 months) to examine the longer-term impact of program participation (and continued individual exercise) on physical fitness, mental health, and overall quality of life.

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References

1. Cleveland KM, Peterson SA. Service learning and self-efficacy in exercise science: outcomes of a community fitness training program involving undergraduate exercise science students. *Adv Physiol Educ*. 2022;46(4):621-629. https://doi.org/10.1152/advan.00058.2022

2. Matta Mello Portugal E, Cevada T, Sobral Monteiro-Junior R, et al. Neuroscience of exercise: from neurobiology mechanisms to mental health. *Neuropsychobiology*. 2013;68(1):1-14. https://doi.org/10.1159/000350946

3. Huang W, Wong TL. Exercise prescriptions for young people's emotional wellbeing: a systematic review of physical activity intensity, duration, and modality. *Front Psychol*. 2025;16:1552531. https://doi.org/10.3389/fpsyg.2025.1552531

4. Prieske O, Dalager T, Herz M, et al. Effects of physical exercise training in the workplace on physical fitness: a systematic review and meta-analysis. *Sports Med*. 2019;49:1903-1921. https://doi.org/10.1007/s40279-019-01179-6

5. Hallam KT, Peeters A, Gupta A, Bilsborough S. Moving minds: Mental health and wellbeing benefits of a 50-day workplace physical activity program. *Curr Psychol*. 2023;42(15):13038-13049. https://doi.org/10.1007/s12144-021-02525-6

6. Faul F, Erdfelder E, Lang A, Buchner A. G*Power3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behav Res Methods*. 2007;39(2):175-191. https://doi.org/10.3758/BF03193146

7. Bize R, Johnson JA, Plotnikoff RC. Physical activity level and health-related quality of life in the general adult population: a systematic review. *Prev Med*. 2007;45(6):401-415. https://doi.org/10.1016/j.ypmed.2007.07.017

8. Rebar AL, Stanton R, Geard D, et al. A meta-meta-analysis of the effect of physical activity on depression and anxiety in non-clinical adult populations. *Health Psychol Rev*. 2015;9(3):366-378. https://doi.org/10.1080/17437199.2015.1022901

9. Singh B, Olds T, Curtis R, et al. Effectiveness of physical activity interventions for improving depression, anxiety and distress: an overview of systematic reviews. *Br J Sports Med*. 2023;57(18):1203-1209. https://doi.org/10.1136/bjsports-2022-106195

10. Navalta JW, Stone WJ, Lyons TS. Ethical issues relating to scientific discovery in exercise science. *Int J Exerc Sci*. 2019;12(1):1-8. https://doi.org/10.70252/EYCD6235

11. Courneya KS, Bobick TM. Integrating the theory of planned behavior with the processes and stages of change in the exercise domain. *Psychol Sport Exerc*. 2000;1(1):41-56. https://doi.org/10.1016/S1469-0292(00)00006-6

12. Padila ML, Dominguez R, Lorenzana J, et al. Exercise attitudes and behavioral stages of change in a university community. *J Am Coll Health*. 2017;65(2):133-140.

13. Resnick B, Jenkins LS. Testing the reliability and validity of the self-efficacy for exercise scale. *Nurs Res*. 2000;49(3):154-159. https://doi.org/10.1097/00006199-200005000-00007

14. Barry TL, Kaiser KL, Atwood JR. Reliability, validity, and scoring of the Health Status Questionnaire-12 version 2.0. *J Nurs Meas*. 2007;15(1):24-35. https://doi.org/10.1891/106137407780851778

15. Stewart-Brown S, Tennant A, Tennant R, et al. Internal construct validity of the Warwick-Edinburgh mental well-being scale (WEMWBS): a Rasch analysis using data from the Scottish health education population survey. *Health Qual Life Outcomes*. 2009;7:1-8. https://doi.org/10.1186/1477-7525-7-15

16. Tennant R, Hiller L, Fishwick R, et al. The Warwick-Edinburgh mental well-being scale (WEMWBS): Development and UK validation. *Health Qual Life Outcomes*. 2007;5(1):1-13. https://doi.org/10.1186/1477-7525-5-63

17. EuroQol Group. EuroQol-a new facility for the measurement of health-related quality of life. *Health Policy*. 1990;16(3):199-208. https://doi.org/10.1016/0168-8510(90)90421-9

18. Gordon BR, McDowell CP, Lyons M, Herring MP. The effects of resistance exercise training on anxiety: a meta-analysis and meta-regression analysis of randomized controlled trials. *Sports Med*. 2017;47:2521-2532. https://doi.org/10.1007/s40279-017-0769-0

19. Mahindru A, Patil P, Agrawal V. Role of physical activity on mental health and well-being: A review. *Cureus*. 2023;15(1). https://doi.org/10.7759/cureus.33475

20. Sharma A, Madaan V, Petty FD. Exercise for mental health. *Prim Care Companion J Clin Psychiatry*. 2006;8(2):106. https://doi.org/10.4088/PCC.v08n0208a

21. Marcus BH, Simkin LR. The stages of exercise behavior. *J Sports Med Phys Fitness*. 1993;33(1):83-88.

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