

Determining the Effectiveness of Yoga Training Combined with a Healthy Lifestyle in Reducing Postural Abnormalities and Improving Social Acceptance among Individuals with Poor Posture and Physical Inactivity

Afagh. Saleh¹, Mojgan. Agahheris^{2*}, Ezzatollah. Kordmirza Nikoozadeh³, Amin. Rafiepoor⁴, Zahra. Karami Baghteyfouni⁵

¹ PhD Student in Health Psychology, Department of Psychology, Payame Noor University, Tehran, Iran

² Associate Professor in Health Psychology, Department of Psychology, Payame Noor University, Tehran, Iran

³ Professor, Department of Psychology, Payame Noor University, Tehran, Iran

⁴ Associate Professor, Department of Psychology, Payame Noor University, Tehran, Iran

⁵ Assistant Professor, Faculty of Educational Sciences and Psychology, Payame Noor University, Tehran, Iran

* Corresponding author email address: m_agah@pnu.ac.ir

Editor

Izet Pehlić
Full professor for Educational sciences, Islamic pedagogical faculty of the University of Zenica, Bosnia and Herzegovina
izet.pehlic@unze.ba

Reviewers

Reviewer 1: Mahdi Khanjani
Associate Professor, Department of Psychology, Allameh Tabataba'i University, Tehran, Iran.
Email: khanjani_m@atu.ac.ir
Reviewer 2: Zahra Yousefi
Assistant Professor, Department of Psychology, Isfahan Branch (Khorasgan), Islamic Azad University, Isfahan, Iran. Email: Z.yousefi1393@khuif.ac.ir

1. Round 1

1.1. Reviewer 1

Reviewer:

The sentence “Based on sample sizes used in comparable intervention studies, 40 eligible individuals were recruited” does not provide an adequate statistical justification for the sample size. The authors should report an a priori power analysis based on the expected time-by-group interaction, the number of repeated measurements, the assumed effect size, statistical power, significance level, and anticipated attrition rate. Given the exceptionally large partial eta-squared values reported for the postural outcomes, a transparent power calculation is particularly important to determine whether the sample size was scientifically planned or selected primarily for feasibility.

The participant-selection paragraph lists “a body mass index greater than 25 kg/m²” as an inclusion criterion, although the research question centers on poor posture and physical inactivity. The rationale for restricting the sample to overweight

participants requires stronger justification. Excess body weight may independently influence balance, lower-limb alignment, movement tolerance, and postural measurements, and may therefore act as either a defining population characteristic or a confounding variable. The authors should report baseline body mass index for each group, examine whether the groups were comparable, and discuss whether weight changed during the intervention and potentially contributed to the observed postural outcomes.

The statement that participants had “insufficient habitual physical activity or a predominantly sedentary lifestyle” lacks an operational definition. The authors should identify the instrument or objective criterion used to classify participants as physically inactive or sedentary, such as accelerometry, sitting-time records, or a validated physical activity questionnaire. Physical inactivity and sedentary behavior are related but conceptually distinct constructs, and they should not be used interchangeably. The manuscript should specify whether eligibility was based on failure to meet physical activity guidelines, excessive daily sitting time, or both.

The Methods section indicates that participants were “examined by physicians and relevant specialists to confirm the presence of postural abnormalities,” but no diagnostic threshold or standardized clinical procedure is reported. The authors should define which postural abnormality or combination of abnormalities qualified an individual for participation and provide the cutoff values used for forward head posture, pelvic tilt, shoulder asymmetry, trunk deviation, knee alignment, foot rotation, and scoliosis risk. It should also be clarified whether eligibility was determined through clinical examination, APECS measurements, or both. Without predefined thresholds, participant selection may have been vulnerable to subjective judgment.

The APECS paragraph describes the software’s functions but does not provide sufficient evidence regarding measurement reliability and validity. The sentence “APECS is a digital posture-analysis application developed to provide a quantitative evaluation of body posture” should be supplemented with psychometric or measurement evidence relevant to the indicators used in this study. The authors should report inter-rater reliability, intra-rater reliability, test–retest reliability, calibration procedures, landmark-identification methods, and evidence of concurrent validity against established photogrammetric or clinical measurements. Citing only the software developer’s website is insufficient for supporting the scientific accuracy of the primary outcome measurements.

The photogrammetric procedure requires substantially more detail. The paragraph stating that “the camera position, distance from the participant, lighting conditions, and body orientation were standardized” should report the actual camera height, participant-to-camera distance, lens orientation, image resolution, background, foot position, clothing requirements, anatomical markers, and instructions given before image acquisition. The authors should also indicate whether participants were assessed barefoot, whether the same camera and room were used at all three stages, and whether repeated images were taken and averaged. These procedural details are essential for replication and for judging the precision of small angular changes.

The demographic findings are limited to age, despite the inclusion of both women and men and the potential importance of sex, education, occupation, body mass index, baseline activity, and type or severity of postural abnormality. The paragraph beginning “A total of 40 participants were included in the study” should provide a fuller comparison of baseline characteristics between groups. Given that one cited study specifically addresses gender differences in response to yoga and lifestyle interventions, the sex distribution should be reported and analyzed or, at minimum, discussed as a potential moderator. Baseline equivalence should be evaluated using appropriate descriptive statistics rather than inferred solely from similar mean ages.

The assumption-testing paragraph is incomplete for a mixed repeated-measures analysis of variance. The authors report Shapiro–Wilk and Levene’s tests but do not present Mauchly’s test of sphericity, although Greenhouse–Geisser corrections were subsequently applied. The manuscript should report the Mauchly statistic, degrees of freedom, and p value for each outcome, followed by the relevant epsilon coefficient. In addition, normality should ideally be examined for model residuals rather than only raw scores, and the authors should describe how outliers, missing observations, and influential cases were assessed.

Response: Revised and uploaded the manuscript.

1.2. Reviewer 2

Reviewer:

The paragraph describing the Crowne–Marlowe instrument contains a fundamental conceptual problem. The sentence “The Crowne–Marlowe Social Acceptance Questionnaire was used to evaluate social acceptance” is inconsistent with the original purpose of the Crowne–Marlowe Social Desirability Scale, which assesses socially desirable response tendencies rather than perceived acceptance by others or interpersonal belonging. The authors must reconsider whether “social acceptance” is the correct construct. If the instrument was used as a measure of social desirability, the title, objectives, hypotheses, results, and discussion should be revised accordingly. If a culturally adapted social acceptance scale was used, its origin, adaptation, construct definition, and validation evidence must be provided.

The scoring description of the Crowne–Marlowe scale is internally inconsistent. The source text and Methods state that the 33 items are answered using “yes” or “no,” yet another statement suggests that the questionnaire was scored on a Likert continuum from strongly agree to strongly disagree. The authors should identify the exact version administered, reproduce its response format accurately, explain reverse-scored items, and state the possible total-score range. This issue is not minor because changing a dichotomous instrument to a Likert format alters its psychometric structure and makes comparisons with previously reported reliability and validity evidence questionable.

The intervention paragraph reports that the experimental group participated in “a 10-session combined intervention,” but it does not state session frequency, session duration, group size, intervention setting, instructor qualifications, or the proportion of each session devoted to yoga and lifestyle education. These details are required for reproducibility and intervention-dose interpretation. The authors should specify whether sessions occurred once or twice weekly, whether they were delivered individually or in groups, how long the yoga and educational components lasted, and whether the instructor was formally trained in yoga therapy, health education, physiotherapy, or psychology.

The intervention was adapted from Agombar and Rippe, yet the manuscript does not explain the adaptation process or demonstrate treatment fidelity. The paragraph beginning “The experimental group participated in a 10-session combined intervention” should clarify which original components were retained, modified, omitted, or added and whether experts reviewed the adapted protocol for cultural and clinical appropriateness. The authors should also report whether a session manual, adherence checklist, supervision procedure, or independent fidelity rating was used. Without fidelity monitoring, it is uncertain whether all participants received the intervention consistently.

Because the intervention combines yoga and healthy lifestyle education in a single experimental condition, the manuscript should avoid attributing the results specifically to yoga or specifically to lifestyle modification. The sentence “combined yoga and healthy lifestyle training produced significant changes” is appropriately cautious, but several explanatory passages separately credit yoga postures, breathing, nutrition, sleep, stress management, and social support as mechanisms. The authors should explicitly acknowledge that the two-group design cannot isolate the independent or additive effects of each component. A factorial or multi-arm design would be required to determine whether yoga, lifestyle education, or their combination produced the observed outcomes.

The control-group condition is insufficiently described. The sentence “The control group did not participate in the structured yoga and lifestyle education sessions during the intervention period” should be expanded to indicate whether participants received usual care, no treatment, educational materials, medical advice, or any concurrent services. The authors should also clarify whether control participants were asked to maintain their usual activity patterns and whether they were later offered the intervention. Because the experimental group received instructor attention, group interaction, expectation enhancement, and repeated behavioral support, the absence of an active comparison condition introduces substantial performance and expectancy bias.

Response: Revised and uploaded the manuscript.

2. Revised

Editor's decision after revisions: Accepted.

Editor in Chief's decision: Accepted.