

Promoting Psychosocial Well-being among Women with Polycystic Ovary Syndrome through Emotional Intelligence Training: A Randomized Controlled Trial

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Abstract

Background

Polycystic ovary syndrome (PCOS) is a common endocrine disorder that adversely affects women's psychological well-being, quality of life, and interpersonal relationships. Emotional intelligence has been proposed as a psychosocial resource that may facilitate adaptation to the challenges associated with PCOS.

Aim

To evaluate the effectiveness of an emotional intelligence training program on emotional intelligence, health-related quality of life, and marital satisfaction among women with PCOS.

Methods

A randomized controlled trial was conducted among 102 married women diagnosed with PCOS at Women's Health Hospital, Assiut University, Egypt. The participants were randomly assigned to either an intervention group ($n = 51$) or a control group ($n = 51$). The intervention group received a structured emotional intelligence training program over four weeks, whereas the control group received routine care. Data were collected at baseline, immediately after the intervention, and at a three-month follow-up via the Schutte Self-Report Emotional Intelligence Test, the Couple Satisfaction Index, and the Polycystic Ovary Syndrome Quality of Life Questionnaire.

Results

Baseline outcome measures were comparable between the groups. Compared with those in the control group, women who received the intervention presented significantly greater emotional intelligence and marital satisfaction scores and significantly lower PCOSQ scores, indicating better health-related quality of life, at both the postintervention and follow-up assessments ($p < 0.05$). Improvements were sustained over the three-month follow-up period.

Conclusion

Emotional intelligence training was associated with significant improvements in emotional intelligence, health-related quality of life, and marital satisfaction among women with PCOS. The incorporation of emotional intelligence-based interventions into comprehensive PCOS care may support emotional adjustment, relational well-being, and quality-of-life outcomes in this population.

Introduction

Women's health and well-being are important public health priorities. In line with Sustainable Development Goal 3 (SDG 3), increasing attention has been directed toward promoting health and well-being across the life course (1, 2) (WHO, 2018). Increasing recognition of the psychological and social dimensions of health has highlighted the need for interventions that improve quality of life and well-being among women living with chronic health conditions. Polycystic ovary syndrome (PCOS) is among the most prevalent endocrine disorders affecting women of reproductive age worldwide. Although prevalence estimates vary according to the diagnostic criteria applied, recent evidence indicates that PCOS affects a substantial proportion of women globally and contributes significantly to morbidity across reproductive years (3, 4).

The impact of PCOS extends beyond reproductive dysfunction to encompass long-term metabolic, cardiovascular, and psychological consequences (5). Global burden analyses have further shown a continuing rise in the prevalence and disability burden associated with PCOS. Nevertheless, many women continue to experience delayed diagnosis, fragmented care, and limited access to appropriate services (6). Additionally, women are more likely to experience depression and anxiety, which may affect their quality of life across emotional, social, and relational domains (7). Symptoms such as hirsutism, acne, obesity, alopecia, and infertility can affect body image, self-confidence, and social interactions, contributing to ongoing psychological distress (8). In addition, concerns about fertility and appearance may place strain on intimate relationships and marital adjustment, further influencing women's well-being (9, 10).

Psychosocial well-being is an important consideration in the management of PCOS, as the impact of the condition extends beyond physical symptoms to affect emotional health, interpersonal relationships, and quality of life. Evidence indicates that women with PCOS experience higher levels of depression, anxiety, and body image dissatisfaction than women without PCOS do, with these challenges contributing substantially to reduced well-being and daily functioning (11). Psychosocial distress in women is often linked not only to clinical manifestations but also to women's perceptions of these symptoms and their effects on self-image and social relationships (12).

Despite the growing recognition of these issues, psychological needs remain underaddressed in routine PCOS care, highlighting the importance of interventions that support emotional adjustment, quality of life, and overall psychosocial well-being. Emotional intelligence has been proposed as an important psychosocial resource that may facilitate adaptation to the challenges associated with PCOS. Evidence suggests that higher levels of emotional intelligence are associated with lower levels of psychological distress, fewer body image concerns, and better health-related quality of life among women with PCOS (13). Furthermore, emotional intelligence is linked to more adaptive coping strategies and greater psychological resilience, factors that may help mitigate the negative impact of chronic symptoms on daily functioning and well-being (14). Given that women with PCOS often exhibit less effective coping

patterns and greater emotional distress, strengthening emotional competencies may represent a promising approach for improving psychosocial outcomes in this population (15).

Emotional intelligence has been associated with better psychological adjustment and quality of life in women with PCOS (16). The evidence regarding the effectiveness of emotional intelligence-based interventions for improving psychosocial outcomes in this population remains limited. The available evidence is particularly limited in Middle Eastern settings, where the psychosocial impact of PCOS may be shaped by cultural expectations surrounding fertility, femininity, and marital life. Addressing this gap may contribute to the development of culturally relevant psychosocial interventions for women living with PCOS. Therefore, this randomized controlled trial aimed to evaluate the effectiveness of an emotional intelligence training program on emotional intelligence, health-related quality of life, and marital satisfaction among women with PCOS.

Methods

Study Design

A randomized controlled trial (RCT) with preintervention, postintervention, and 3-month follow-up assessments was conducted to evaluate the effectiveness of an emotional intelligence training program.

Setting

The study was conducted at the gynecological outpatient clinic and the Assisted Reproductive Technology (ART) Unit of Women's Health Hospital, Assiut University, Assiut, Egypt. The hospital is a tertiary referral center that provides comprehensive reproductive health services to women from rural and urban communities across Upper Egypt.

Participants

A total of 102 married women diagnosed with polycystic ovary syndrome (PCOS) were recruited from the gynecological outpatient clinic and the assisted reproductive technology (ART) unit at Women's Health Hospital, Assiut University, Egypt. Sample size estimation was performed via G*Power software (version 3.1.3), assuming an effect size of 0.50, a power of 80%, and a significance level of 5%, resulting in a required sample of 102 participants. Women aged 18–45 years who had been diagnosed within the previous six months with PCOS according to the Rotterdam criteria, agreed to participate, provided written informed consent, and were available for follow-up assessments were eligible for inclusion. Women with preexisting psychological disorders requiring specialized psychiatric care were excluded. The participants were assigned to either the intervention group (n = 51) or the control group (n = 51) at a 1:1 ratio via simple randomization. Allocation was performed by a research assistant who had no role in participant recruitment, data collection, or implementation of the intervention.

Data collection tools

Data were collected through a structured face-to-face interview questionnaire comprising four instruments. The first instrument was a patient assessment questionnaire developed by the researchers on the basis of a review of the literature. It consisted of two parts. Part I assessed participants' sociodemographic and general characteristics, including age, education, occupation, residence, family history, duration of marriage, and body mass index (BMI). Part II assessed obstetric and gynecological characteristics, including gravidity, parity, abortion history, menstrual regularity, and infertility status.

The second instrument was the Schutte Self-Report Emotional Intelligence Test (SSEIT), developed by Schutte et al. (1998) (17). The scale consists of 33 items rated on a five-point Likert scale ranging from strongly disagree (1) to strongly agree (5). The total scores range from 33–165, with higher scores indicating greater emotional intelligence. Percentage scores of $\geq 75\%$ were classified as high emotional intelligence, whereas scores $< 75\%$ were classified as low emotional intelligence.

The third instrument was the Couple Satisfaction Index (CSI-32), developed by Funk and Rogge (2007) (18). The tool consists of 32 items that assess marital satisfaction across several aspects of relationship functioning, including emotional connection, communication, conflict resolution, and overall relationship satisfaction. Total scores range from 0 to 161, with scores ≥ 104 indicating satisfactory marital relationships and scores < 104 indicating dissatisfaction.

The fourth instrument was the Polycystic Ovary Syndrome Quality of Life Questionnaire (PCOSQ), adapted from (19). The questionnaire consists of 55 items distributed across four domains: physical functioning, psychological functioning, social functioning and personal relationships, and sexual functioning. Impairment levels were categorized as low, moderate, or high, with higher scores indicating poorer quality of life.

Validity and reliability

The study instruments were reviewed by a panel of three experts in obstetrics and gynecology from the Faculties of Nursing and Medicine at Assiut University to assess their clarity, relevance, comprehensiveness, and applicability. Minor modifications were made according to their recommendations. A pilot study was conducted on 10% of the study sample to evaluate the clarity and feasibility of the instruments. As no substantial modifications were needed, pilot participants were included in the final sample. Internal consistency was assessed via Cronbach's alpha coefficient. The Cronbach's alpha values were 0.90 for the Schutte Self-Report Emotional Intelligence Test (SSEIT), 0.98 for the Couple Satisfaction Index (CSI-32), and 0.924 for the Polycystic Ovary Syndrome Quality of Life Questionnaire (PCOSQ), indicating good internal consistency.

Intervention procedure

Baseline data were collected before the intervention was implemented via the study instruments. The emotional intelligence training program was developed on the basis of a review of the relevant literature and expert recommendations. The participants in the intervention group attended four structured sessions delivered in small groups over a four-week period. Each session lasted approximately 45–60 minutes and included group discussions, brainstorming, problem-solving activities, and practical examples. An educational booklet written in simple Arabic was provided to support learning and reinforce key concepts.

The first session included participant orientation and an introduction to the program. The second session addressed the concept and importance of emotional intelligence and its different dimensions. The third session focused on emotional intelligence skills and their application in everyday situations. The fourth session reviewed the program content and reinforced the main learning points. Participants in the control group received routine care provided by the clinic. Post intervention assessment was conducted immediately after completion of the program via the same study instruments. A follow-up assessment was performed 12 weeks later through clinic visits and telephone calls.

Ethical considerations

Ethical approval was obtained from the Research Ethics Committee of the Faculty of Nursing, Assiut University (Approval No. 1120230680; October 2023). Written informed consent was obtained from all participants prior to enrollment. Participation was voluntary, and participants were informed of their right to withdraw from the study at any time without consequences. The confidentiality and anonymity of all the collected data were maintained throughout the study.

Statistical analysis:

The data were coded, entered, and analyzed via the Statistical Package for the Social Sciences (SPSS), version 20. Descriptive statistics were applied, with qualitative variables presented as frequencies and percentages, while quantitative variables were summarized using means and standard deviations or medians and ranges, as appropriate. The chi-square test or Fisher's exact test was used to compare categorical variables between groups. Independent samples t tests and Mann–Whitney U tests were used to compare continuous variables according to data distribution. Emotional intelligence, quality of life, and marital satisfaction scores were compared between the intervention and control groups at baseline, postintervention, and follow-up. Mean differences and 95% confidence intervals (CIs) were calculated for all continuous outcome measures. A linear mixed-effects model was used to evaluate the effects of group, time, and group-by-time interactions on marital satisfaction across repeated assessments. A p value of ≤ 0.05 was considered statistically significant.

Results

Table 1

Baseline demographic and clinical characteristics of women with polycystic ovary syndrome in the intervention and control groups (n = 102)

Characteristic	Intervention (n = 51)	Control (n = 51)	P value
Age (years), Mean $\pm$ SD	30.61 $\pm$ 4.98	32.06 $\pm$ 4.34	0.120
Residence, n (%)			
Rural	22 (43.1)	30 (58.8)	0.113
Urban	29 (56.9)	21 (41.2)	
Educational level, n (%)			
Basic education or less	14 (27.5)	17 (33.3)	0.081
Secondary school	18 (35.3)	19 (37.3)	
University education	19 (37.3)	15 (29.4)	
Occupation, n (%)			
Working	22 (43.1)	19 (37.3)	0.545
Housewife	29 (56.9)	32 (62.7)	
Body mass index (kg/m ²), Mean $\pm$ SD	27.64 $\pm$ 4.47	28.69 $\pm$ 5.32	0.064
Family history of PCOS, n (%)			
Yes	14 (27.5)	20 (39.2)	0.208
No	37 (72.5)	31 (60.8)	
Duration of marriage (years), Median (Range)	5.0 (1.0–15.0)	6.0 (1.0–15.0)	0.051

Table 1 shows that the mean ages of the women in the intervention and control groups were 30.61 $\pm$ 4.98 and 32.06 $\pm$ 4.34 years, respectively. More than half of the women in the intervention group (56.9%) and 41.2% of those in the control group resided in urban areas. With respect to educational level, 37.3% of women in the intervention group and 29.4% in the control group had a university education. More than half of the participants in both groups were housewives (56.9% and 62.7%, respectively). The mean body mass index was 27.64 $\pm$ 4.47 kg/m² in the intervention group and 28.69 $\pm$ 5.32 kg/m² in the control group. No statistically significant differences were observed between the two groups regarding age, residence, educational level, occupation, body mass index, family history of PCOS, or duration of marriage ($p > 0.05$).

Table 2

Baseline obstetric characteristics of women with polycystic ovary syndrome in the intervention and control groups (n = 102)

Characteristic	Intervention (n = 51)	Control (n = 51)	P value
Gravidity, Median (Range)	1.0 (0–4)	2.0 (0–6)	0.284
Parity, Median (Range)	1.0 (0–4)	1.0 (0–3)	0.613
Number of abortions, Median (Range)	0.0 (0–3)	1.0 (0–3)	0.023

Table 2 shows the baseline obstetric characteristics of women with PCOS in the intervention and control groups. No statistically significant differences in gravidity or parity were detected between the two groups ($p > 0.05$). However, women in the control group reported a significantly greater number of previous abortions than did those in the intervention group did (median = 1.0 vs. 0.0, $p = 0.023$).

Table 3

Changes in overall emotional intelligence scores among women with polycystic ovary syndrome in the intervention and control groups across the study period (n = 102)

Assessment time	Intervention (n = 51) Mean $\pm$ SD	Control (n = 51) Mean $\pm$ SD	Between-group mean difference (95% CI)	P value
Baseline	3.16 $\pm$ 0.38	3.14 $\pm$ 0.30	0.02 (– 0.11 to 0.15)	0.740
Postintervention	3.44 $\pm$ 0.27	3.17 $\pm$ 0.28	0.27 (0.16 to 0.38)	< 0.001
Follow-up	4.00 $\pm$ 0.25	3.27 $\pm$ 0.34	0.73 (0.61 to 0.85)	< 0.001

Table 3 shows the changes in overall emotional intelligence scores among women with PCOS across the study period. At baseline, emotional intelligence scores were comparable between the intervention and control groups ($p = 0.740$). Following the intervention, women in the intervention group achieved significantly higher emotional intelligence scores than did those in the control group did (3.44 $\pm$ 0.27 vs. 3.17 $\pm$ 0.28; mean difference = 0.27, 95% CI: 0.16–0.38; $p < 0.001$). At follow-up, the between-group difference increased further in favor of the intervention group (4.00 $\pm$ 0.25 vs. 3.27 $\pm$ 0.34; mean difference = 0.73, 95% CI: 0.61–0.85; $p < 0.001$).

Table 4

Changes in overall health-related quality of life (PCOSQ total score) among women with polycystic ovary syndrome in the intervention and control groups across the study period (n = 102)

Assessment time	Intervention (n = 51) Mean $\pm$ SD	Control (n = 51) Mean $\pm$ SD	Between-group mean difference (95% CI)	P value
Baseline	2.24 $\pm$ 0.29	2.17 $\pm$ 0.26	0.07 (– 0.04 to 0.18)	0.206
Postintervention	1.99 $\pm$ 0.26	2.13 $\pm$ 0.23	–0.14 (– 0.24 to – 0.04)	0.004
Follow-up	1.61 $\pm$ 0.24	2.03 $\pm$ 0.19	–0.42 (– 0.50 to – 0.34)	< 0.001

Table 4 shows the changes in overall health-related quality of life scores among women with PCOS across the study period. At baseline, no statistically significant difference was observed between the intervention and control groups ($p = 0.206$). Following the intervention, women in the intervention group had significantly lower PCOSQ scores than those in the control group did (1.99 $\pm$ 0.26 vs. 2.13 $\pm$ 0.23; mean difference = – 0.14, 95% CI: –0.24 to – 0.04; $p = 0.004$). At follow-up, the between-group difference increased further in favor of the intervention group (1.61 $\pm$ 0.24 vs. 2.03 $\pm$ 0.19; mean difference = – 0.42, 95% CI: –0.50 to – 0.34; $p < 0.001$).

Table 5

Changes in overall marital satisfaction scores among women with polycystic ovary syndrome in the intervention and control groups across the study period (n = 102)

Assessment time	Intervention (n = 51) Mean $\pm$ SD	Control (n = 51) Mean $\pm$ SD	Between-group mean difference (95% CI)	P value
Baseline	79.25 $\pm$ 23.73	76.20 $\pm$ 13.32	3.05 (– 4.51 to 10.61)	0.424
Postintervention	93.04 $\pm$ 20.54	72.31 $\pm$ 14.20	20.73 (13.81 to 27.65)	< 0.001
Follow-up	112.90 $\pm$ 20.12	75.63 $\pm$ 14.24	37.27 (30.30 to 44.24)	< 0.001

Table 5 shows the changes in overall marital satisfaction scores among women with PCOS across the study period. At baseline, the marital satisfaction scores did not differ significantly between the intervention and control groups (79.25 $\pm$ 23.73 vs. 76.20 $\pm$ 13.32; mean difference = 3.05, 95% CI: –4.51 – 10.61; $p = 0.424$). Following the intervention, women in the intervention group had significantly higher marital satisfaction scores than those in the control group did (93.04 $\pm$ 20.54 vs. 72.31 $\pm$ 14.20; mean difference = 20.73, 95% CI: 13.81–27.65; $p < 0.001$). At follow-up, a larger between-group difference was observed in favor of the intervention group (112.90 $\pm$ 20.12 vs. 75.63 $\pm$ 14.24; mean difference = 37.27, 95% CI: 30.30–44.24; $p < 0.001$).

Table 6
Linear mixed-effects model evaluating the effect of the emotional intelligence intervention on marital satisfaction over time among women with polycystic ovary syndrome (PCOS) (n = 102)

Fixed effect	Estimate (β)	95% CI	P value
Intercept	76.20	72.10 to 80.30	< 0.001
Intervention group (vs. Control)	3.05	-4.51 to 10.61	0.424
Postintervention (vs. Baseline)	-3.89	-8.92 to 1.14	0.129
Follow-up (vs. Baseline)	-0.57	-5.61 to 4.47	0.824
Intervention $\times$ Postintervention	17.68	10.74 to 24.62	< 0.001
Intervention $\times$ Follow-up	34.22	27.25 to 41.19	< 0.001

Table 6 presents the results of the linear mixed-effects model examining the effect of the emotional intelligence intervention on marital satisfaction over time. No significant baseline difference in marital satisfaction was observed between the intervention and control groups ($\beta = 3.05$, $p = 0.424$). The main effects of time were also not statistically significant. However, significant group-by-time interactions were observed at both postintervention ($\beta = 17.68$, 95% CI: 10.74–24.62; $p < 0.001$) and follow-up ($\beta = 34.22$, 95% CI: 27.25–41.19; $p < 0.001$), indicating that women in the intervention group experienced greater improvements in marital satisfaction over time than those in the control group did.

Discussion

The findings of the present randomized controlled trial underscored that emotional intelligence training improved psychosocial well-being among women with PCOS, as evidenced by emotional intelligence, health-related quality of life, and marital satisfaction. With respect to baseline demographic and clinical characteristics, the intervention and control groups were comparable, with no statistically significant differences in age, residence, educational level, occupation, BMI, family history of PCOS, duration of marriage, gravidity, or parity. These findings agree with previous intervention studies involving women with PCOS (20, 21). The absence of significant baseline differences supports the comparability of the two groups following random allocation and strengthens the internal validity of the findings.

Conversely, a significant baseline difference was observed in previous abortion history, with a greater median number of abortions in the control group (1.0 vs. 0.0, $p = 0.023$). This finding is consistent with that of Alduwaisan et al. (2023), suggesting that previous reproductive loss may be important for psychological and marital outcomes (22). Nevertheless, a single statistically significant baseline difference may occur by chance, particularly in a relatively small sample, and does not necessarily undermine the validity of the randomized design.

The present study revealed a significant improvement in emotional intelligence following the intervention, with higher scores observed immediately after the intervention and a more pronounced

between-group difference at the three-month follow-up. This continued improvement may reflect the ongoing application and reinforcement of emotional awareness and emotion-regulation skills developed during training.

These findings are concordant with those of Mattingly and Kraiger (2019), whose meta-analysis of 58 studies demonstrated a moderate positive effect of emotional intelligence training, supporting the modifiability of emotional intelligence (23). Similarly, Di Salvo et al. (2023) reported that higher trait emotional intelligence was associated with better quality of life among women with PCOS, with psychological distress and dysmorphic concerns partially explaining this relationship (24). The present findings extend this evidence by demonstrating that emotional intelligence can not only be associated with psychological well-being but also be enhanced through structured training.

A significant improvement in marital satisfaction was also observed among women with PCOS who received emotional intelligence training. Although the groups were comparable at baseline, the intervention group reported higher marital satisfaction immediately after the intervention, with the between-group difference becoming more pronounced at the three-month follow-up. This sustained improvement may reflect enhanced communication and healthier marital interactions following the intervention.

These findings are supported by those of Barberis et al. (2023), who reported that higher TEI was associated with lower psychological distress and better quality of life among women with PCOS (25). In addition, Loh et al. (2020) and Pastoor et al. (2024) documented impairments in sexual satisfaction and sexual functioning among women with PCOS, which may negatively affect intimate and relational well-being (26, 27). Thus, the present findings may extend previous evidence by suggesting that emotional intelligence training has the potential to improve broader aspects of marital well-being.

The health-related quality of life findings further support the beneficial effect of the intervention. Women who received emotional intelligence training showed significant improvement in PCOSQ scores after the intervention and at follow-up, with the between-group difference becoming more evident after three months. This improvement may be related to enhanced emotional awareness and regulation, which could help women cope more effectively with the psychological and social challenges associated with PCOS.

This interpretation is supported by Barberis et al. (2023), who identified emotional intelligence as an important psychological resource associated with better quality of life and lower psychological distress among women with PCOS (25). Similarly, Pastoor et al. (2024) highlighted the substantial impact of PCOS on various aspects of women's well-being (27). Patten et al. (2021) also reported improved quality of life following exercise interventions in women with PCOS, supporting the positive direction of the present findings, although their intervention differed from the emotional intelligence training used in the current study (28). The continued improvement at follow-up may suggest that targeting emotional competencies can provide benefits beyond the immediate postintervention period.

The linear mixed-effects model further confirmed a significant group-by-time interaction for marital satisfaction, with greater improvement in the intervention group immediately after the intervention and at the three-month follow-up. This finding suggests that the intervention had a sustained effect rather than a short-term postintervention effect. These findings are consistent with those reported by Milani et al. (2020) and Oweidat et al., (2024), who reported that emotional intelligence training significantly improved marital satisfaction among women (29, 30). The stronger effect at follow-up may indicate that emotional skills require time and repeated use to become integrated into daily life and marital interactions. However, because changes in couple communication and partners' responses were not directly assessed, this interpretation should be considered cautiously. Overall, the findings support emotional intelligence training as a potentially valuable complementary psychosocial component of comprehensive PCOS care.

Conclusion

This randomized controlled trial demonstrated that emotional intelligence training was associated with significant improvements in emotional intelligence, health-related quality of life, and marital satisfaction among women with PCOS. The intervention group showed progressive improvements from baseline to postintervention assessment, with benefits maintained at the three-month follow-up. These findings highlight the importance of addressing the psychosocial dimensions of PCOS in addition to its physical manifestations. Emotional intelligence training may therefore serve as a useful supplement to comprehensive PCOS management aimed at improving women's psychological and relational well-being. Further studies with longer follow-up periods and more diverse populations are warranted.

Limitations

Several limitations should be acknowledged. First, the study was conducted in a single tertiary hospital, which may limit the generalizability of the findings to women with PCOS in other healthcare settings. Second, the participants were restricted to married women, limiting the applicability of the results to unmarried women with PCOS. Third, outcomes were assessed over a relatively short follow-up period of three months; therefore, the long-term sustainability of the intervention effects remains uncertain. In addition, all the outcome measures were self-reported and may have been influenced by response and social desirability biases. A baseline imbalance in abortion history was also observed between groups, which may have affected psychosocial outcomes. Finally, the blinding of participants was not feasible because of the nature of the intervention, introducing the possibility of performance bias.

Declarations

Author Contribution

HM and MK conceptualized and designed the study. GH and MT were responsible for data collection and field supervision. AA and AH performed data entry, statistical analysis, and interpretation. MT drafted the

initial manuscript, conducted thorough revisions, and handled correspondence with the journal. HM and GH critically revised the manuscript for important intellectual content. All authors read and approved the final version of the manuscript.

Ethics approval and consent to participate

Ethical approval was obtained from the Research Ethics Committee of the Faculty of Nursing, Assiut University (Approval No. 1120230680; October 2023). Written informed consent was obtained from all participants prior to enrollment. Participation was voluntary, and participants were informed of their right to withdraw from the study at any time without consequences. The confidentiality and anonymity of all collected data were maintained throughout the study. The study was conducted in accordance with the Declaration of Helsinki.

Consent for publication

Not Applicable.

Clinical trial number:

Not applicable

Data statement

The researchers attest that all pertinent data have been included in the results of this paper. No information was left out of the analyses. The corresponding author has made the datasets used in this investigation accessible.

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Competing interest

The authors declare no competing interests.

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