*Systematic Review*

# Effect of Lifestyle and Gynecological Oncology Nursing Interventions on Quality of Life Improvement: A Systematic Review and Meta-Analysis

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**Abstract**

**Background**: Gynecologic cancer refers to a variety of malignancies that originate in the reproductive organs of women, including the cervix, ovaries (epithelial and germ cell), uterus (endometrial or corpus as well as sarcoma), vagina, and vulva. Gynecologic oncology nursing is a specialized field offering an integrated approach to treating and managing gynecological cancers, addressing their physical and psychological needs. This systematic review and meta-analysis aimed to evaluate the efficacy of lifestyle intervention plus gynecological care on quality-of-life (QoL) outcomes in women with a diagnosis of at least one type of gynecological cancer. **Methods**: A methodological adherence to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines resulted in 1034 articles being identified following an exhaustive search of electronic databases. A meta-synthesis was conducted using Rev Man for the 10 studies that met all eligibility criteria after screening. **Results**: Lifestyle interventions showed significant associations with improved QoL outcomes when comparing baseline measurements to those taken six months post-lifestyle intervention (lifestyle: mean difference (MD) = 0.47, 95% confidence interval (95% CI): 0.09 to 0.86), $p = 0.02$. However, the pooled effect sizes were not statistically significant (lifestyle: MD = 0.77, 95% CI: –3.00 to 4.54), $p = 0.69$. Nursing interventions showed mixed effects (MD = 0.94, 95% CI: –5.26 to 7.14), $p = 0.77$ and no statistically significant improvement in QoL compared to control groups. Sensitivity analysis indicated potential publication bias. Nonetheless, most papers exhibited a minimal risk of bias. Significant heterogeneity was also seen in pooled analyses, possibly indicating variations in study populations, intervention types, and outcome measures. **Conclusions**: This study suggests lifestyle interventions can improve the QoL in gynecological cancer patients. However, oncology nursing interventions show inconsistent effects, with no significant improvement in the pooled analysis. Future research should standardize interventions to improve understanding of their impact. **Registration**: The study has been registered on https://www.crd.york.ac.uk/prospero/ (registration number: CRD42024617625).

**Keywords**: life style intervention; nutritional intervention; gynecological oncology; nursing care; quality of life; cancer care; meta-analysis

## 1. Introduction

Any cancer commencing in the female reproductive organs is referred to as gynecologic cancer. Gynecologic cancers, including cervical, ovarian, uterine, vaginal, and vulvar cancers, continue to present a significant public health challenge, impacting millions of women worldwide [1]. These cancers are not only physically debilitating but also induce considerable emotional and psychological strain. While advances in treatment have been made, the incidence of these cancers is rising globally, and the overall prognosis remains poor in many regions, especially where access to healthcare is limited [2]. Research on gynecological oncology nursing care highlights the need for holistic and multidisciplinary approaches to patient care, as these cancers profoundly affect women's quality of life (QoL).

On the other hand, effective nursing interventions go beyond managing physical symptoms such as pain and nausea; they encompass emotional support, psychological counseling, patient education, and symptom management. These interventions play a pivotal role in improving patient outcomes, helping women navigate the complexities of treatment regimens, and ensuring comprehensive care. The impact of nursing interventions on QoL, however, remains an area that requires further exploration, particularly in terms of understanding how various aspects of nursing care can influence physical, emotional, and psychological well-being across diverse patient populations [3].

Good nursing care for cancer patient can enhance the overall wellbeing of the cancer patients. Gynecological oncology nursing care is a dedicated field of nursing which will emphases on giving a broad attention to women diagnosed with gynecological cancers [4]. Gynecological cancers include granulosa cell tumors, genital tract melanoma, cervical cancer with fertility-sparing surgery, and endometrial cancer [5].

Cervical cancer incidence has declined in Europe but remains a significant public health concern. This is under-

scored by 2018 data reporting 61,000 new cases and 25,800 deaths. Survival outcomes also reveal disparities across the region, with a five-year relative survival rate of 62% between 2000 and 2007, ranging from 57% in Eastern Europe to 67% in Northern Europe. Cervical cancer remains a significant global health issue despite advances in prevention and treatment. In 2020, there were an estimated 604,000 new cases and 342,000 deaths worldwide [6]. There is a great variation of cervical cancer rates across different geographical regions. These differences result due to complex interactions between healthcare infrastructure, access to screening and vaccination programs, socioeconomic factors and cultural practices. These disparities underscore the need for targeted nursing interventions to improve patient outcomes and bridge gaps in care across different regions.

Other gynecological cancers, including ovarian, uterine, and vulvar cancers, also present significant health challenges. For example, ovarian cancer is the most common cause of gynecological cancer deaths worldwide, with over 300,000 new cases and 185,000 deaths annually [6]. The survival rates for ovarian and uterine cancers are generally higher than those for cervical cancer, but significant disparities still exist between countries and regions. Similar to cervical cancer, these differences are influenced by healthcare access, early detection practices, and treatment availability. Targeted nursing interventions are equally necessary for these cancers to improve outcomes and enhance quality of life for women globally [7].

Gynecologic oncology nurses provide comprehensive, patient-centered care, going beyond emotional support. In addition to emotional support, they assist with treatment planning, advocate for patient needs, and guide them through the treatment process. Successful interventions include symptom management such as pain control, fatigue, and nausea, psychological counseling, and patient education programs that improve both emotional and physical outcomes [8]. Multidisciplinary care models combining psychological support and physical rehabilitation have been particularly effective in enhancing quality of life. Thus, gynecologic oncology nurses play a crucial role in symptom management, patient education, and holistic care, leading to improved patient outcomes [8].

This specialized nursing care encompasses a range of functions, including administering chemotherapy, monitoring and interpreting vital signs, assessing therapeutic responses, and providing comprehensive support, all of which require specialized training and expertise in oncology nursing [9]. Nursing care plays a significant role in improving people's well-being across various healthcare settings. In hospitals, they administer treatments, monitor conditions, and collaborate with the medical team. In home-care centers, nurses provide ongoing support, manage chronic conditions, and help patients maintain independence.

Quality of life encompasses physical, mental, emotional, and social well-being [10]. Nursing care plays a crit-

ical role in enhancing these aspects by providing targeted interventions. For instance, ongoing care for patients with chronic conditions includes monitoring vital signs, administering medications, and teaching self-management strategies [11]. These nursing interventions help manage chronic diseases effectively, alleviating symptoms and improving physical health, ultimately leading to a better overall quality of life.

Gynecologic cancers remain a major public health issue for women globally, with over 1 million women diagnosed annually, resulting in significant impairments in physical function as well as psychological disturbances, leading to a reduction in QoL [12]. Studies show that up to 40% of women with gynecologic cancers experience significant emotional distress, while 60% report a decline in physical health-related quality of life during treatment (Global Cancer Statistics and Reports, https://www.who.int/). This study aims to evaluate the impact of lifestyle interventions and gynecological oncology nursing care on improving the quality of life in women diagnosed with gynecological cancers, through a systematic review and meta-analysis approach.

The study also aims to narrows its focus to evaluate the effects of specific lifestyle interventions and high-quality gynecological oncology nursing care on key QoL dimensions, such as physical, emotional, and social well-being. By concentrating on standardized QoL metrics and clearly defined intervention strategies, we aim to provide actionable insights into the efficacy of these approaches. In particular, this study investigates the short-term effects (within six months) of intensive psychological nursing care on the emotional and social well-being. This targeted approach allows for a more in-depth examination of how focused interventions influence QoL outcomes and provides evidence to inform tailored care strategies for patients with gynecological cancers.

## 2. Methods

### 2.1 Search Strategy

The search strategy was carried out in accordance to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. Searches were performed in PubMed, Cochrane, Google Scholar, MEDLINE, EMBASE, and Web of Science. The following terms were used in combination with Boolean operators "AND" and "OR" to refine the search: "gynaecological oncology nursing", "oncology nursing care", "nursing care in improving quality of life", "health status of gynaecological cancer patients", "gynaecological cancer patients satisfaction", "gynaecologic cancer care", "intensive oncology nursing care" and "gynaecological cancer" were utilized without imposing any restrictions, covering the period from their inception to February 2024. Additionally, the references of all the included articles were manually browsed and screened.
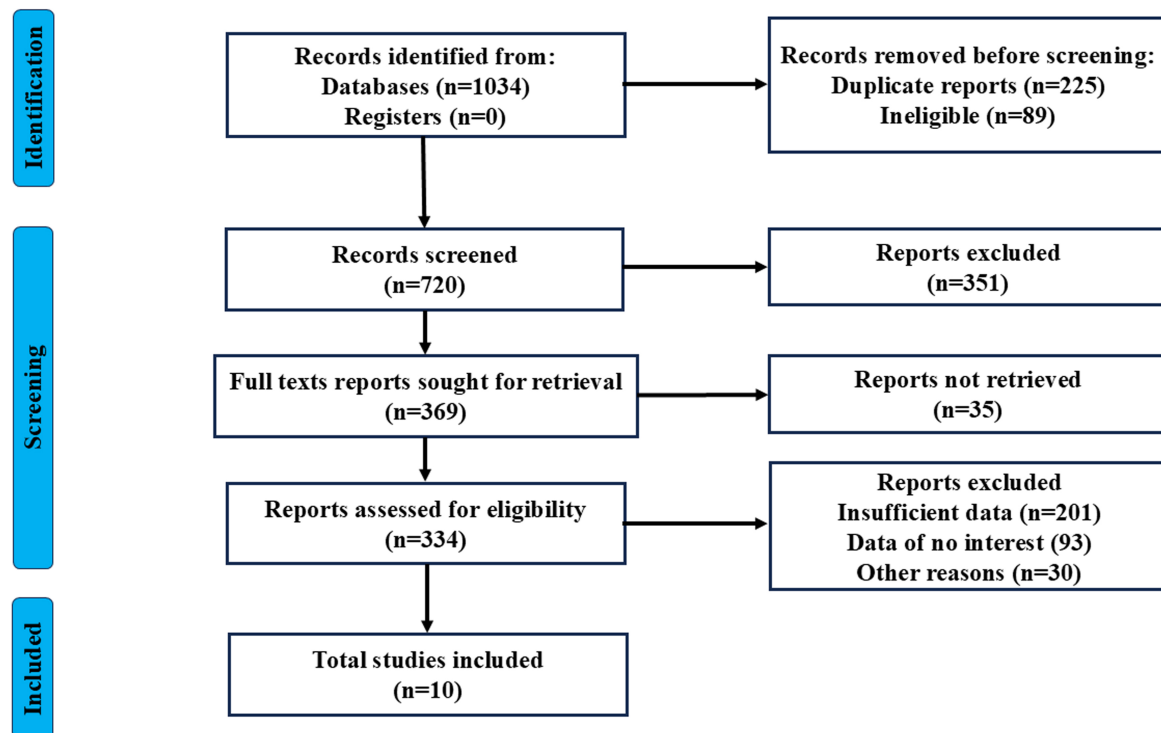
**Fig. 1. Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2009 flow of the study process.**

## 2.2 Study Criteria and Selection

The inclusion criteria encompassed studies that satisfied the following conditions:

• Study design: prospective randomized controlled trials (RCTs) appearing in peer-reviewed journals.

• Population: individuals (21 years or older) diagnosed with any form of gynecologic cancer.

• Exploration of nursing interventions on quality of life or health status.

• Comparators: absence of a specified nursing care intervention.

• Language: studies are available in the English language.

The criteria for exclusion were outlined as follows:

• Conference abstracts protocols, dissertations, theses, editorial letters, duplicate studies, reviews, and guidelines.

• Studies involving mixed cancer cohorts, animal study, review articles, and pediatric cancer reports.

• Studies that assessed a follow-up period of fewer than 3 months.

• Elimination of non-comparative studies, as well as studies utilizing simulation techniques.

• Chinese articles.

## 2.3 Study Selection

Two evaluators independently handled the selection and extraction of data, carefully following the PRISMA guidelines and the protocols we had established. These guidelines were used to thoroughly review the full texts of the articles, applying the criteria we had set for inclusion and exclusion. The reviewers went through important details like titles, abstracts, author names, affiliations, publication years, and study types to make sure the studies fit our criteria. They each did this work on their own, but if they didn't see eye to eye on something, they'd talk it over with a third reviewer to sort it out. Whenever we found that something was missing, we got in touch with the authors directly by email to ask for the needed information or the full study text.

## 2.4 Statistical Analysis

The statistical analysis procedures were carried out using RevMan 5.0 (The Nordic Cochrane Centre, The Cochrane Collaboration, Copenhagen, Denmark). The meta-analysis for dichotomous data used the number of events and total participants, whereas continuous data required mean, standard deviation and total participants.

The RevMan software expressed the results as odds ratios (OR) with 95% confidence intervals (95% CI). Heterogeneity between studies was assessed using the Q statistic test, with significance indicated if the $p$-value $\leq 0.05$. Additionally, $I^2$ values, which range from 0% to 100%, were used to quantify the degree of heterogeneity. High $I^2$ values ($>50\%$) suggested a considerable degree of heterogeneity, implying variability in the effect size across studies that may arise from differences in study design, population, or

**Table 1. Characteristics of the included study.**

| Study | Study design | Follow up | Follow up time point | Intervention process | Intervention group (N) | Control group (N) |
|---|---|---|---|---|---|---|
| Donnelly *et al.* 2011 [13] | RCT | Nursing and home based | 3 months, 6 months | Behavioral physical activity and nutritional counselling | 16 | 17 |
| Jeppesen *et al.* 2018 [14] | RCT | Nursing and home based | 6 months | Nursing tailored | 11 | 12 |
| Maurer *et al.* 2022 [15] | RCT | Nursing | 3 months, 6 months | Exercise and nutrition program | 5 | 6 |
| McCarroll *et al.* 2014 [16] | RCT | Nursing and home based | 3 months, 6 months | Nutrition, exercise, behavioral modification | 41 | 34 |
| McCorkle *et al.* 2009 [17] | RCT | Nurse tailored intervention by an advanced practice nurse and psychiatric consultation liaison nurse | 6 months | Nurse tailored | 63 | 60 |
| Morrison *et al.* 2018 [18] | RCT | Nursing and home based | 6 months | Nurse tailored | 47 | 49 |
| Ngu *et al.* 2020 [19] | RCT | Psychosocial intervention using nurse-led consultations and telephone | 6 months | Nurse tailored | 79 | 77 |
| Rossi *et al.* 2016 [20] | RCT | Nursing | 6 months | Physical activity intervention | 17 | 12 |
| Von Gruenigen *et al.* 2009 [21] | RCT | Nursing and home based | 3 months, 6 months | Behavioral physical activity and nutritional counselling | 23 | 22 |
| Zhou *et al.* 2017 [22] | RCT | Nursing | 6 months | Nurse tailored | 74 | 70 |

RCT, randomized controlled trial; N, number.

interventions. In the presence of significant heterogeneity ($I^2 > 50\%$), a random effects model was applied to account for this variability, allowing for more robust and generalized conclusions. Subgroup analysis was also conducted, and significance was considered when the *p*-value $\leq 0.05$. Publication bias was assessed using Begg's funnel plot, with a significance threshold of $p < 0.05$. Risk of bias for individual studies was evaluated using the Cochrane Critical Appraisal Checklist, and the Quality Assessment of Diagnostic Accuracy Studies (QUADAS-2) tool assessed factors such as patient selection, index test, reference standard, and flow and timing. Bias levels and concerns about applicability were classified as low, high, some concern or no information according to the quality criteria used by each study. Where necessary, authors were contacted via email to fill in gaps or provide missing articles entirely.

## 3. Results

### 3.1 Characteristics of the Included Studies

This study was previously registered with Prospective Register of Systematic Reviews (PROSPERO) (CRD42024617625) and followed PRISMA guidelines as depicted in Fig. 1. An exhaustive search of online databases initially identified 1034 articles. To refine this collection, the titles and abstracts were reviewed, resulting in the elimination of 225 duplicate records and 89 ineligible articles, leaving 720 records. Following this preliminary screening, 351 additional articles were excluded for not being relevant to the meta-analysis topic. We then reviewed the full-text versions of the remaining 369 articles, identifying 334 as suitable for further consideration. During a subsequent review, we excluded studies due to insufficient data (201 articles), lack of relevant information (93 articles), and other various reasons such as conference abstracts, inappropriate study design, irrelevant outcome and overlapping (30 articles). In the end, only 10 studies met our inclusion criteria and were selected for detailed analysis, as illustrated in Fig. 1. These studies, published between 2009 and 2022 involved a total of 735 patients (376 patients in the intervention group and 359 in the control group). Among these, a total of 337 patients underwent for the lifestyle intervention (176 in the intervention group and 161 in the control group) and 398 patients for the nursing intervention (200 in the intervention group and 198 in the control group).

### 3.2 Characteristics of Life Style Intervention

Table 1 (Ref. [13–22]) displays the specifics of the intervention studies that were chosen. The majority of the trials focused on exercise programs, while one study combined exercise with nutrition [15], and another four focused on nursing intervention. The intervention duration ranged from three weeks to six months, with participants asked to adopt new lifestyle habits. Several studies included a behavioral component, with counseling as a core part of the intervention [21]. The physical activity component included unsupervised exercise modalities such as aerobic, aerobic-resistance, and a combination of aerobic, strength, and flexibility training. The primary goal for most exercise programs and nursing interventions was to achieve 150 minutes of moderate-to-vigorous exercise per week. Dietary changes and nutritional counseling were also incorporated in the interventions.

### 3.3 Effect of Life Style Intervention in QoL

The meta-analysis evaluated the effects of lifestyle and nutritional interventions on global QoL outcomes at two distinct follow-up periods: 6 months and 3 months. Fig. 2 represents the forest plot for outcomes at the 6-month follow-up, while Fig. 3 focuses on the 3-month follow-up. It provided a comprehensive assessment of the intervention's efficacy across these studies. The analyses represented each study's effect size as mean differences with a 95% CI. Fig. 2 shows the forest plot, which includes a summary measure, heterogeneity statistics, and the overall effect size. As shown in Fig. 2, Donnelly *et al.* (2011) [13] reported a 2.81 mean difference favoring the intervention, Maurer *et al.* (2022) [15] showed 11.80, while Zhou *et al.* (2017) [22] presented a –3.70 negative mean difference, suggesting that the control group performed better. The overall mean difference was computed as 0.77 with a 95% CI ranging from –3.00 to 4.54. The lack of a significant overall effect might suggest that the intervention has limited or inconsistent efficacy across different populations or settings. This could be due to variability in the study designs, populations, intervention types, or measurement methods. The heterogeneity analysis provides important context for interpreting the meta-analysis results. $Tau^2 = 7.47$ represents the between-study variance, while $Chi^2 = 8.11$ with 5 degrees of freedom (df) and a *p*-value of 0.15 suggests that the heterogeneity might not be due to chance alone but could be attributed to genuine differences between the studies. The $I^2 = 38\%$ also indicates moderate heterogeneity, suggesting that while there is some variability between the studies, it is not excessively high. Fig. 3 presents the forest plot comparing the intervention group to the control group across four studies. The results show no significant difference between the intervention and control groups, with a confidence interval crossing zero. The overall pooled mean difference was 0.93, and the test for overall effect (Z) yielded 0.58, indicating no statistically significant difference. The $I^2 = 0\%$ indicates homogeneity, meaning the studies are measuring similar outcomes, but this homogeneity does not provide persuasive evidence of the intervention's effectiveness. The confidence intervals for all studies crossed zero, suggesting that the intervention had a negligible impact or that its effect was indistinguishable from random variation.
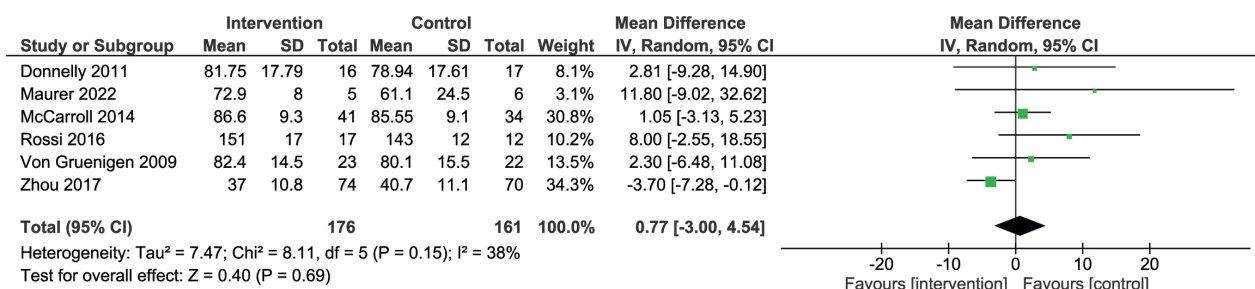
| Study or Subgroup | Intervention Mean | SD | Total | Control Mean | SD | Total | Weight | Mean Difference IV, Random, 95% CI | Mean Difference IV, Random, 95% CI |
|---|---|---|---|---|---|---|---|---|---|
| Donnelly 2011 | 81.75 | 17.79 | 16 | 78.94 | 17.61 | 17 | 8.1% | 2.81 [-9.28, 14.90] | |
| Maurer 2022 | 72.9 | 8 | 5 | 61.1 | 24.5 | 6 | 3.1% | 11.80 [-9.02, 32.62] | |
| McCarroll 2014 | 86.6 | 9.3 | 41 | 85.55 | 9.1 | 34 | 30.8% | 1.05 [-3.13, 5.23] | |
| Rossi 2016 | 151 | 17 | 17 | 143 | 12 | 12 | 10.2% | 8.00 [-2.55, 18.55] | |
| Von Gruenigen 2009 | 82.4 | 14.5 | 23 | 80.1 | 15.5 | 22 | 13.5% | 2.30 [-6.48, 11.08] | |
| Zhou 2017 | 37 | 10.8 | 74 | 40.7 | 11.1 | 70 | 34.3% | -3.70 [-7.28, -0.12] | |
| **Total (95% CI)** | | | **176** | | | **161** | **100.0%** | **0.77 [-3.00, 4.54]** | |

Heterogeneity: Tau² = 7.47; Chi² = 8.11, df = 5 (P = 0.15); I² = 38%
Test for overall effect: Z = 0.40 (P = 0.69)

**Fig. 2. Forest plot illustrating the effect of lifestyle and nutritional interventions on global quality of life (QoL) at the 6-month follow-up.** Data from six studies are presented, with each study's effect size measured as a mean difference (MD) and a 95% confidence interval (CI). IV, inverse variance; SD, standard deviation.
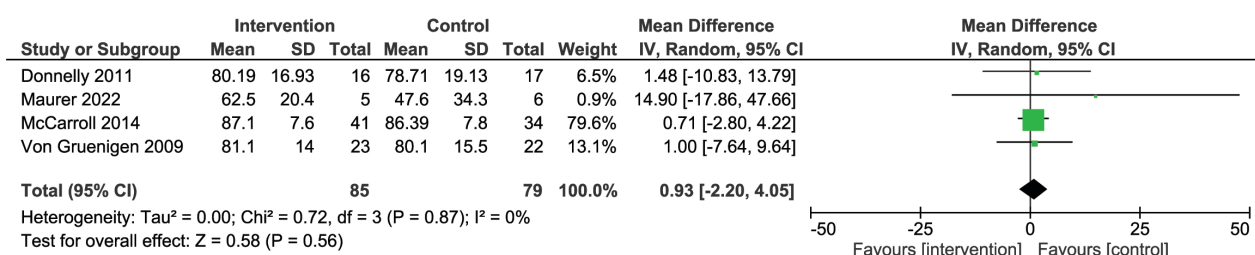
| Study or Subgroup | Intervention Mean | SD | Total | Control Mean | SD | Total | Weight | Mean Difference IV, Random, 95% CI | Mean Difference IV, Random, 95% CI |
|---|---|---|---|---|---|---|---|---|---|
| Donnelly 2011 | 80.19 | 16.93 | 16 | 78.71 | 19.13 | 17 | 6.5% | 1.48 [-10.83, 13.79] | |
| Maurer 2022 | 62.5 | 20.4 | 5 | 47.6 | 34.3 | 6 | 0.9% | 14.90 [-17.86, 47.66] | |
| McCarroll 2014 | 87.1 | 7.6 | 41 | 86.39 | 7.8 | 34 | 79.6% | 0.71 [-2.80, 4.22] | |
| Von Gruenigen 2009 | 81.1 | 14 | 23 | 80.1 | 15.5 | 22 | 13.1% | 1.00 [-7.64, 9.64] | |
| **Total (95% CI)** | | | **85** | | | **79** | **100.0%** | **0.93 [-2.20, 4.05]** | |

Heterogeneity: Tau² = 0.00; Chi² = 0.72, df = 3 (P = 0.87); I² = 0%
Test for overall effect: Z = 0.58 (P = 0.56)

**Fig. 3. Forest plot illustrating the effect of lifestyle and nutritional interventions on global quality of life (QoL) at the 3-month follow-up.** Data from four studies are presented, with each study's effect size measured as a mean difference (MD) and a 95% confidence interval (CI).

### 3.4 Effect of Nursing Intervention in QoL

Fig. 4 presents the forest plot for the meta-analysis of four studies comparing the intervention and control groups over a six-month period. The pooled mean difference was 0.94, with a high level of heterogeneity at 88%. Individual study results varied, with one showing a significant positive effect, another a significant negative effect, and the rest showing no significant impact. The forest plot indicates that oncology nursing interventions had a mixed effect on quality of life. However, Morrison *et al.* (2018) [18] showed a significant positive effect, but the overall pooled estimate did not indicate a significant difference between the intervention and control groups. The high heterogeneity suggests variability in outcomes across the studies. The studies included Jeppesen *et al.* (2018) [14], McCorkle *et al.* (2009) [17], Morrison *et al.* (2018) [18] and Ngu *et al.* (2020) [19]. The total participants in the meta-analysis were 200 and 198, with a pooled mean difference of 0.94. The test for heterogeneity showed no observed heterogeneity among the included studies, indicating that the observed differences could be due to random chance rather than true differences in effect size. The forest plot indicates that oncology nursing interventions over a 6-month period do not significantly improve the quality of life compared to the control groups.

### 3.5 Comparison from Baseline to Six-Months Intervention in Improving QoL

Fig. 5 presents the forest plot comparing quality of life after six months of lifestyle intervention versus baseline for the intervention group. The meta-analysis suggests a positive effect of the interventions compared to baseline, with an overall standardized mean difference (SMD) (OR = 0.47, 95% CI: 0.09 to 0.86), which is statistically significant. The diagnostic odds ratio indicates a relatively good effect size suggesting variability across studies. The pooled analysis revealed a statistically significant improvement in the overall quality of life in patients who received intensive gynecological oncology nursing care compared to the control. The study suggests that lifestyle interventions, on average, positively impacted the quality of life of patients with gynecological cancer after six months (*p*-value = 0.02).

### 3.6 Sensitivity Analysis.

A sensitivity analysis was conducted to assess the reliability of the meta-analysis findings by investigating the effect of inclusion or exclusion of specific papers. Comprehensive sensitivity analyses were conducted to evaluate the strength and reliability of the results and investigate possible causes of variation among the trials. Fig. 6 presents the funnel plots for analyzing the QoL benefits in both the lifestyle intervention group (Fig. 6A) and the nursing intervention group (Fig. 6B). The funnel plot for the lifestyle intervention group (Fig. 6A) shows relative symmetry, in-
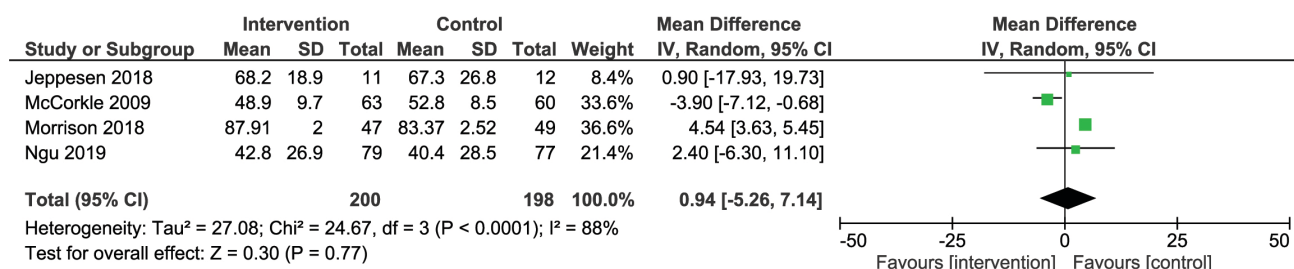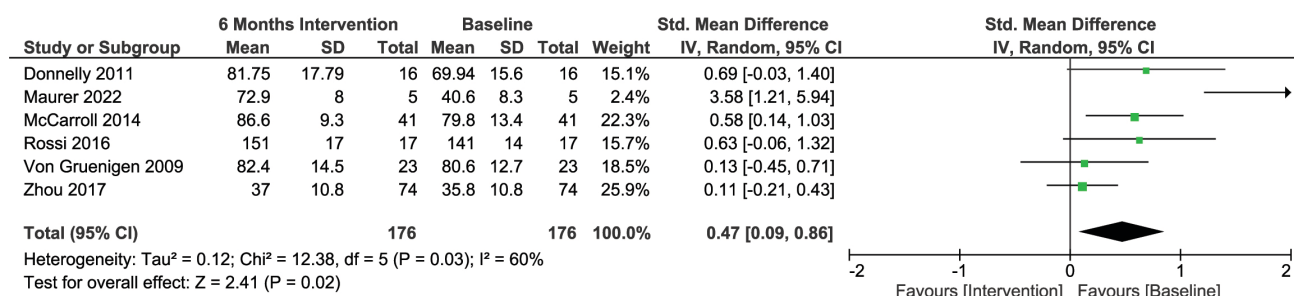
| Study or Subgroup | Intervention Mean | SD | Total | Control Mean | SD | Total | Weight | Mean Difference IV, Random, 95% CI | Mean Difference IV, Random, 95% CI |
|---|---|---|---|---|---|---|---|---|---|
| Jeppesen 2018 | 68.2 | 18.9 | 11 | 67.3 | 26.8 | 12 | 8.4% | 0.90 [-17.93, 19.73] | |
| McCorkle 2009 | 48.9 | 9.7 | 63 | 52.8 | 8.5 | 60 | 33.6% | -3.90 [-7.12, -0.68] | |
| Morrison 2018 | 87.91 | 2 | 47 | 83.37 | 2.52 | 49 | 36.6% | 4.54 [3.63, 5.45] | |
| Ngu 2019 | 42.8 | 26.9 | 79 | 40.4 | 28.5 | 77 | 21.4% | 2.40 [-6.30, 11.10] | |
| | | | | | | | | | |
| Total (95% CI) | | | 200 | | | 198 | 100.0% | 0.94 [-5.26, 7.14] | |

Heterogeneity: Tau² = 27.08; Chi² = 24.67, df = 3 (P < 0.0001); I² = 88%
Test for overall effect: Z = 0.30 (P = 0.77)

Favours [intervention]   Favours [control]

**Fig. 4. Forest plot illustrating the effect of gynecological oncology nursing on global quality of life (QoL) at the 6-month follow-up.** Data from four studies are presented, with each study's effect size measured as a mean difference (MD) and a 95% confidence interval (CI).

| Study or Subgroup | 6 Months Intervention Mean | SD | Total | Baseline Mean | SD | Total | Weight | Std. Mean Difference IV, Random, 95% CI | Std. Mean Difference IV, Random, 95% CI |
|---|---|---|---|---|---|---|---|---|---|
| Donnelly 2011 | 81.75 | 17.79 | 16 | 69.94 | 15.6 | 16 | 15.1% | 0.69 [-0.03, 1.40] | |
| Maurer 2022 | 72.9 | 8 | 5 | 40.6 | 8.3 | 5 | 2.4% | 3.58 [1.21, 5.94] | |
| McCarroll 2014 | 86.6 | 9.3 | 41 | 79.8 | 13.4 | 41 | 22.3% | 0.58 [0.14, 1.03] | |
| Rossi 2016 | 151 | 17 | 17 | 141 | 14 | 17 | 15.7% | 0.63 [-0.06, 1.32] | |
| Von Gruenigen 2009 | 82.4 | 14.5 | 23 | 80.6 | 12.7 | 23 | 18.5% | 0.13 [-0.45, 0.71] | |
| Zhou 2017 | 37 | 10.8 | 74 | 35.8 | 10.8 | 74 | 25.9% | 0.11 [-0.21, 0.43] | |
| | | | | | | | | | |
| Total (95% CI) | | | 176 | | | 176 | 100.0% | 0.47 [0.09, 0.86] | |

Heterogeneity: Tau² = 0.12; Chi² = 12.38, df = 5 (P = 0.03); I² = 60%
Test for overall effect: Z = 2.41 (P = 0.02)

Favours [Intervention]   Favours [Baseline]

**Fig. 5. Forest plot illustrating the effect of life style intervention on improving quality of life (QoL) from baseline to 6-month follow-up.** Data from six studies are presented, with each study's effect size measured as a mean difference (MD) and a 95% confidence interval (CI).

dicating minimal publication bias and moderate variability in the effect sizes. However, the funnel plot for the nursing intervention group (Fig. 6B) demonstrates asymmetry, suggesting potential publication bias and greater variability in the reported outcomes. Therefore, additional caution is warranted when interpreting the stability and generalizability of these results.

### 3.7 Risk of Bias

The QUADAS-2 traffic plot was used to evaluate the risk of bias and applicability concerns across four key domains for each study: Patient Selection, Index Test, Reference Standard, and Flow and Timing.

Fig. 7 summarizes the risk of bias across these four domains for nursing interventions aimed at improving QoL. The QUADAS-2 traffic plot (Fig. 7A) and summary plot (Fig. 7B) identify areas where bias may have been introduced or where the applicability to clinical practice may be limited. Most studies exhibited a low risk of bias, suggesting that the results are reliable. However, several studies showed areas for caution such as von Gruenigen et al. [21] demonstrates a notable susceptibility to bias in at least two areas, therefore suggesting that its results should be construed with precision. In general, while the majority of research on nursing treatments to enhance quality of life in gynecological patients are strong and trustworthy, some studies, notably von Gruenigen et al. [21], raise issues that

need very careful evaluation of their reliability and validity. Moreover, Morrison et al. [18] showed risk of bias in the index test and Rossi et al. [20] also showed risk of bias in the reference standard, respectively.

## 4. Discussion

The study provides strong evidence supporting the beneficial effects of lifestyle interventions and gynecological oncology nursing care in improving the overall QoL among patients with gynecological cancers. The study necessitates integrating comprehensive nursing strategies into gynecologic oncology patients care [23]. The meta-analysis on lifestyle treatments contrasted intervention and control groups, suggesting effectiveness. The pooled analysis shows a mean difference of 0.77, however most studies indicate non-significant findings and broad confidence ranges. This emphasises the importance of patient demographics, baseline health state, and socioeconomic situations. The variability and moderate heterogeneity in the outcomes may arise from disparities in research design, demographic characteristics, or intervention execution. Study design differences, including randomised controlled trials (RCTs) and observational studies, might create biases or influence the comparability of results. Variations in demographic attributes, including age, initial health condition, socio-economic position, and cultural influences, may potentially affect the observed outcomes. Future re-
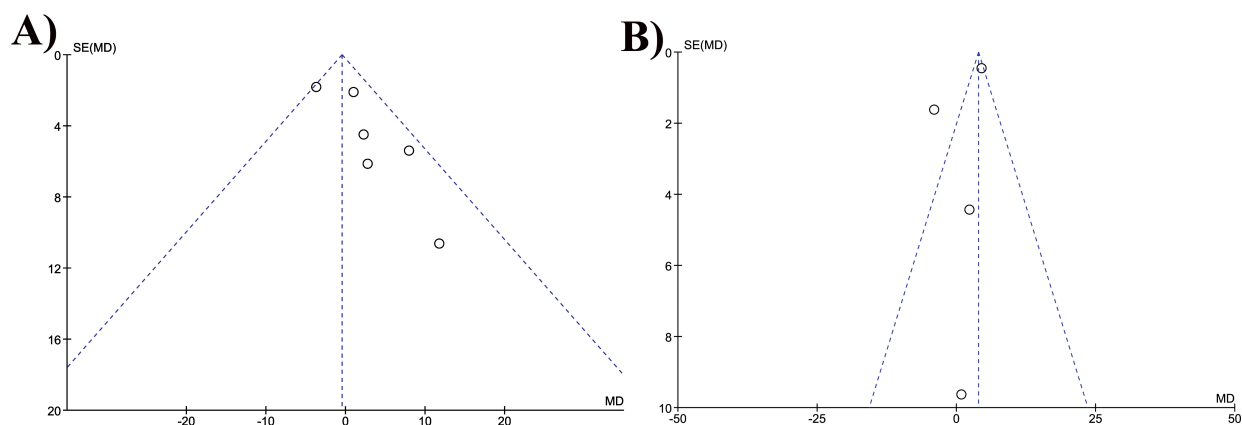
**Fig. 6. Funnel plot outcomes for six months on QoL for (A) life style and nutritional intervention and (six studies) (B) gynecological oncology nursing intervention (four studies).**

search should prioritise standardised processes while permitting adaptability in treatments. Consequently, by acknowledging these causes of variability and heterogeneity, researchers may formulate more effective, context-specific therapies that enhance outcomes for varied groups. The result is in agreement with prior reports by Mokhtari-Hessari and Montazeri (2020) [24], which reported significant improvements in QoL among breast cancer patients. Their study focus on addressing symptoms like pain and lymphedema, as well as emotional and sexual health concerns [24].

Similarly, Wang *et al.* (2023) [25] validated the QoL in Patient/Cancer Survivor Version (QOLCSV-C) as a reliable tool for measuring cancer survivors' QoL and suggested future refinement for enhanced precision and cost-effectiveness. However, Smits *et al.* (2015) [26] found no significant effects of similar interventions, highlighting the critical role of participant engagement and implementation quality in influencing outcomes. The study emphasises nurses' importance in preventing illness, encouraging healthy lifestyles, and meeting patients' physical and emotional needs. Nurses' holistic approach reduces anxiety, sadness, and stress, enhancing patient well-being and treatment results. They improve patient independence and dignity via rehabilitation, education, and palliative care, improving QoL [27]. This is because nurses are directly or indirectly engaged in promoting health and inhibition of disease activities. They teach patients about fit and wealthy lifestyles, immunizations, and early recognition and understanding of health problems. Care pertaining to prevention of disease onset and outbreak can help patients stay healthier and enjoy a higher quality of life. Nurses have a key role to fill in health care, particularly with pain management and assessment as it is something they experience each day. First and foremost is to provide patients with as much comfort while dealing with both short term pain or more longer.

Nurses are supposed to care for not only the physical needs of a patient but emotional as well, from those who can't speak and even through the healing process with families. That help is critical particularly in challenging moments: receiving a medical diagnosis, being hospitalized. It helps to reduce the level of anxiety, depression and stress that can greatly impact upon how a person feels emotionally [28].

Another key part of a nurse's job is educating both patients and their families about the patient's condition and the care they need. This education helps families provide better support, which can improve the patient's social well-being and quality of life. In palliative and hospice care, nurses focus on providing comfort and managing symptoms, making sure patients have a peaceful and dignified end-of-life experience. The care they offer in these settings can have a profound impact, offering much-needed comfort to both patients and their families during difficult times [29]. Nurses also play an important role in helping patients recover from surgeries, injuries, or illnesses. Their support in physical rehabilitation is crucial for helping people regain their independence, which is a big part of improving their quality of life. Nurses also spend a lot of time educating patients about their health, treatment options, and the importance of self-care. This education can lead to better decision-making, greater adherence to treatment plans, and ultimately a better quality of life [30]. Primary care providers also have an important role. They should offer guidance on maintaining a healthy lifestyle, keep a close eye on symptoms that might emerge after treatment, and make sure that patients stick to their prescribed therapies. These providers are essential advocates for cancer survivors and those undergoing long-term treatments, providing ongoing support, education, and monitoring to help improve their patients' overall quality of life.

Nursing care interventions demonstrated substantial positive impacts on physical, emotional, and social di-
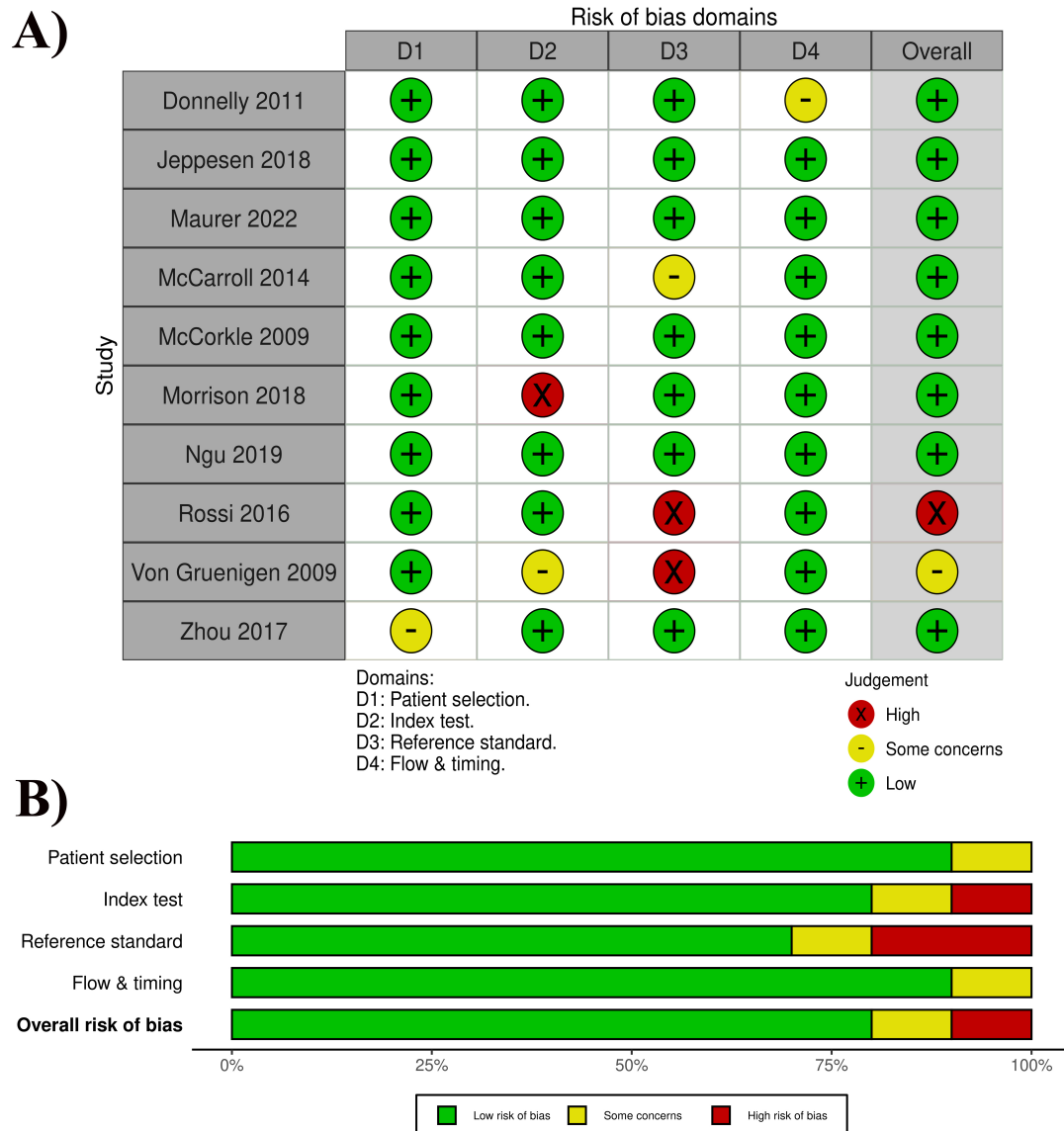
**Fig. 7. Quality Assessment of Diagnostic Accuracy Studies (QUADAS-2) traffic plot.** (A) Summary of the risk of bias assessment for each included study across four domains: D1 (Patient Selection), D2 (Index Test), D3 (Reference Standard), and D4 (Flow & Timing) and (B) Bar chart representing the proportion of studies providing a visual representation of the overall risk of bias across the included studies, highlighting potential methodological weaknesses.

mensions of QoL. For example, Aktas *et al.* (2015) [31] found that home-based nursing care significantly enhanced QoL among women undergoing gynecological cancer management. Furthermore, Ma *et al.* (2021) [32] showed that intensive psychological nursing care mitigated adverse moods and enhanced QoL in cervical cancer patients compared to standard care. Tuominen *et al.* [33] reported that high-quality nursing care reduced postoperative complications, shortened recovery times, and improved overall outcomes for patients with gynecological cancer. The primary influencing factors for postoperative incision infections in gynecological tumor patients included the dura-

tion to resume ambulation, time for postoperative meals, recovery time after surgery, length of hospital stay, and the overall quality of life. The positive impact of high-quality nursing interventions on preventing postoperative incision infections is evident, highlighting the need for their widespread implementation in clinical nursing practice [31]. To lessen the possibility of reappearance and subsequent tumours, appraisal of lifestyle dynamics counting use of smoke cigarettes, fatness, and use of liquors are essential. Routine physical activity will also enhance the quality of life and strengthen the rate of increase in cancer persistence; it might also give a big contribution in manag-

ing cases of exhaustion, discomfort, metabolic syndrome, osteoporosis, and cognitive impairment [34]. Despite the considerable emphasis on survivorship care plans and clinics, there is a scarcity of evidence demonstrating their effectiveness in enhancing outcomes [31]. Nursing care is an integral part of healthcare that directly affects the quality of life of patients. Through their holistic approach to care, nurses contribute to physical, mental, emotional, and social well-being, ultimately helping individuals live healthier, more fulfilling lives. The effect of nursing care in quality life shines the spot light for having a compassionated and well trained nurses as part of health system [35]. In fact, further studies are needed to determine which parts of nursing care that has the greatest impact on the outcome and also in addressing patient subgroups who may benefit most from this intervention.

Finally, strengthening the nursing care providing to patients with gynecological disease has an importance in which can improve their concerns for better health-related quality of life among these other individuals reducing as a result from patient-centered and comprehensive cancer care [36]. In addition, future investigation should involve identification of the most effective elements of nursing care and determination which patient groups may benefit best. Furthermore, large long-term follow-up studies are needed to investigate the aspects of quality-of-life performance. Funders who are being asked to sponsor health care interventions would also do well to reconsider how they spend their money in relevance of the efficacy evidence. Future research should find out why the key elements of successful interventions are what they are and unpack reasons for outcome variation between populations and settings. It all helps in creating a more productive and well-rounded campaign that combines social media for maximum visibility.

## 5. Limitations and Future Implications

There are several limitations in the study. First, time-based selection bias may have occurred during the screening process, as changes in clinical practices, research methodologies, and nursing care over time could have influenced study outcomes. Although no restrictions were placed on the publication year, future research should examine how temporal factors affect results. Second, the heterogeneity across the included studies, including differences in study designs, patient populations, and intervention methods, introduces variability that may impact the generalizability of the findings. Additionally, publication bias could have influenced the results, as only published studies were included, potentially leading to an overestimation of the efficacy of interventions. The majority of the included studies also had short follow-up periods, limiting insights into the long-term sustainability of improvements in QoL. Furthermore, there was a lack of detailed subgroup analyses, making it difficult to identify which specific patient populations might benefit most from these interven-

tions. This is because of the inherent variability and limited granularity of the data obtained from the included studies. Moreover, the included studies varied significantly in terms of their design, patient populations, and intervention methodologies. Future research should focus on long-term follow-up studies to assess the sustainability of QoL improvements over time. Subgroup analyses should be prioritized to understand the differential impacts of interventions on various patient characteristics such as age, disease stage, and socioeconomic background. Additionally, more research is needed to explore the underlying mechanisms through which lifestyle interventions and nursing care influence QoL, as well as economic evaluations to assess the cost-effectiveness of these interventions.

## 6. Conclusions

In summary, our study demonstrates lifestyle intervention could improve the QoL in women who have been diagnosed with gynecological cancers. The study suggested a beneficial influence of the lifestyle interventions on QoL, especially after six months follow-up. However, the impact of oncology nursing interventions remains inconclusive, with mixed results and no statistically significant pooled effect. These outcomes underscore the need for further research to standardize intervention protocols and reduce variability in study designs and populations. Areas for future work will include investigating the components of life style and nursing interventions which are most effective, exploring what underpins variability in outcome, and looking at longer-term outcomes and the sustainability of QoL improvements.

## Availability of Data and Materials

All data points generated or analysed during this study are included in this article and there are no further underlying data necessary to reproduce the results.

## Author Contributions

LH designed the research study, performed the meta-analysis research and analyzed the data. LH contributed to editorial changes in the manuscript; LH read and approved the final manuscript. LH has participated sufficiently in the work and agreed to be accountable for all aspects of the work.

## Ethics Approval and Consent to Participate

Not applicable.

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## Conflict of Interest

The author declares no conflict of interest.

## Declaration of AI and AI-assisted Technologies in the Writing Process

During the preparation of this work the author used QuillBot in order to check spell and grammar. After using this tool, the author reviewed and edited the content as needed and takes full responsibility for the content of the publication.

## Supplementary Material

Supplementary material associated with this article can be found, in the online version, at https://doi.org/10.31083/CEOG26379.

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