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THE ROLE OF PHYSICAL ACTIVITY IN THE MANAGEMENT OF POLYCYSTIC OVARY SYNDROME (PCOS): METABOLIC, HORMONAL, REPRODUCTIVE, AND PSYCHOLOGICAL OUTCOMES — A NARRATIVE REVIEW

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ABSTRACT

Background: Polycystic ovary syndrome (PCOS) is the most common endocrine disorder in women of reproductive age and is associated with insulin resistance, hyperandrogenism, ovulatory dysfunction, adverse cardiometabolic profiles, and a substantial burden of psychological distress. Lifestyle modification is recommended as first-line management, and physical activity has emerged as a central, modifiable component of non-pharmacological care.

Objective: This narrative review synthesises current evidence on the effects of physical activity and structured exercise on metabolic, hormonal, reproductive, and psychological outcomes in women with PCOS, and considers the comparative value of different exercise modalities.

Methods: A narrative review was conducted using PubMed, Google Scholar, and Scopus for publications from 2015 to 2025, supplemented by seminal earlier work. Randomised controlled trials, cohort studies, systematic reviews, and meta-analyses evaluating structured or habitual physical activity in women with PCOS were analysed qualitatively.

Results: Regular exercise was consistently associated with improved insulin sensitivity, favourable changes in body composition and lipid profiles, reductions in circulating androgens with increased sex hormone-binding globulin, and improvements in menstrual regularity, ovulation, psychological well-being, and quality of life. Many benefits occurred independently of substantial weight loss. Aerobic, resistance, high-intensity interval, and combined training all conferred benefits, with effect sizes varying by modality, intensity, and duration.

Conclusions: Physical activity is an effective and broadly beneficial element of PCOS management. Individualised exercise prescription, strategies to improve adherence, and higher-quality trials are needed to optimise and standardise recommendations.

KEYWORDS

Polycystic Ovary Syndrome, PCOS, Physical Activity, Exercise, Quality Of Life, Insulin Resistance

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1. Introduction

Polycystic ovary syndrome (PCOS) is the most common endocrine disorder among women of reproductive age, affecting an estimated 6–15% of this population depending on the diagnostic criteria applied (Bozdag et al., 2016; Teede et al., 2023). The syndrome is diagnosed by the presence of at least two of three features: clinical or biochemical hyperandrogenism, ovulatory dysfunction, and polycystic ovarian morphology on ultrasound examination or elevated anti-Müllerian hormone (AMH) levels (Teede et al., 2023). The 2023 international evidence-based guideline, endorsed by 39 professional societies, for the first time accepted elevated AMH as an alternative to ultrasound in adults, reflecting an evolving and increasingly standardised diagnostic framework (Teede et al., 2023). Importantly, PCOS is clinically heterogeneous, comprising several phenotypes that differ in their metabolic and reproductive risk, which has direct implications for how interventions such as physical activity should be individualised.

Beyond its reproductive manifestations, PCOS is strongly associated with adverse metabolic features, including insulin resistance, compensatory hyperinsulinaemia, central adiposity, dyslipidaemia, and an increased risk of impaired glucose tolerance and type 2 diabetes mellitus. Insulin resistance is regarded as a central pathophysiological driver of the syndrome and is present in approximately 70–80% of affected women, occurring in both lean and overweight individuals, although it is amplified by excess adiposity (Patten et al., 2020; Harrison et al., 2011). Hyperinsulinaemia further stimulates ovarian androgen production and suppresses hepatic synthesis of sex hormone-binding globulin (SHBG), thereby increasing the bioavailability of circulating androgens and linking the metabolic and reproductive dimensions of the disorder (Harrison et al., 2011).

These metabolic disturbances carry important long-term implications. Women with PCOS are at increased risk of type 2 diabetes, metabolic syndrome, and cardiovascular risk factors, and the condition is

also associated with non-alcoholic fatty liver disease, obstructive sleep apnoea, and — through chronic anovulation and unopposed oestrogen exposure — with endometrial hyperplasia (Teede et al., 2023). Together with its reproductive and psychological burden, this lifelong cardiometabolic risk profile provides a strong rationale for early and sustained interventions, such as physical activity, that can favourably modify several of these risk pathways at once (Bozdag et al., 2016; Teede et al., 2023).

The impact of PCOS extends well beyond physical health. Affected women frequently experience reduced self-esteem, body-image dissatisfaction, and impaired health-related quality of life, and they report anxiety and depressive symptoms significantly more often than women without the condition (Cooney et al., 2017; Kałużna et al., 2022). A systematic review and meta-analysis by Brutocao et al. (2018) demonstrated substantially higher depression and anxiety scores among women with PCOS than among healthy controls, reinforcing the need for management strategies that address both the somatic and the psychological dimensions of the syndrome.

Lifestyle modification — encompassing dietary change, increased physical activity, and behavioural support — is universally recommended as the first-line approach to PCOS management (Teede et al., 2023; Lim et al., 2019; Szczuko et al., 2021). Within this framework, physical activity has attracted growing interest as a distinct therapeutic tool capable of influencing metabolic, hormonal, and psychosocial pathways, in part independently of weight loss (Patten et al., 2020; Kogure & Lara, 2021). This is clinically relevant because many women with PCOS find sustained weight reduction difficult to achieve and maintain, and exercise offers measurable health benefits that do not depend on reaching a specific body weight.

Despite this interest, important questions remain regarding the optimal type, intensity, frequency, and duration of exercise, the comparative effectiveness of different modalities, and the translation of trial findings into routine clinical practice. The present narrative review therefore aims to: (i) summarise current evidence on the effects of physical activity on metabolic, hormonal, reproductive, and psychological outcomes in women with PCOS; (ii) compare the principal exercise modalities; and (iii) discuss implementation considerations, including exercise prescription, adherence, and special populations, in order to inform a more individualised and patient-centred approach to care.

2. Methods

This study was designed as a narrative review of the scientific literature exploring the relationship between physical activity and polycystic ovary syndrome. A narrative rather than systematic design was selected because of the substantial heterogeneity of available study designs, exercise protocols, and outcome measures, which limits the applicability of quantitative synthesis methods and favours an integrative, interpretive overview.

A literature search was conducted using PubMed, Google Scholar, and Scopus. The following keywords and their combinations were applied: polycystic ovary syndrome, PCOS, physical activity, exercise, training, aerobic exercise, resistance training, high-intensity interval training, yoga, quality of life, mental health, insulin resistance, androgen, and women. Boolean operators (AND, OR) were used to refine the search strategy. The primary focus was on articles published between 2015 and 2025; however, seminal earlier studies and systematic reviews that remain foundational to the field were also included where relevant.

Only full-text publications written in English and involving women of reproductive age diagnosed with PCOS were considered. Original randomised controlled trials (RCTs), prospective cohort studies, systematic reviews, and meta-analyses examining the effects of structured or habitual physical activity or exercise interventions were included. Studies conducted on animals, case reports, conference abstracts, editorials, and articles not directly related to physical activity interventions were excluded.

The selected publications were analysed qualitatively. Particular attention was paid to exercise modality (aerobic, resistance, high-intensity interval training, yoga, mixed), intensity, frequency, and total duration of intervention, as well as reported metabolic, hormonal, reproductive, psychological, and quality-of-life outcomes. The methodological quality of included studies was considered during interpretation; however, formal quality scoring was not applied, consistent with narrative review methodology. This approach allows breadth and the integration of mechanistic and clinical perspectives, but it does not eliminate the potential for selection bias inherent to narrative synthesis.

3. Results

3.1. Physical activity and sedentary behaviour in women with PCOS

Although lifestyle modification is the recognised first-line treatment for PCOS, the physical activity behaviour of affected women is itself an important consideration. Evidence on whether women with PCOS are less active than their peers is mixed: some population-based studies report lower physical activity levels and greater sedentary time in women with PCOS (Tay et al., 2020), whereas other studies find broadly comparable activity and sitting time between women with and without the syndrome. Regardless of these between-group comparisons, a substantial proportion of women with PCOS do not meet recommended physical activity targets, and prolonged sedentary behaviour is common (Tay et al., 2020; Teede et al., 2023).

Because excess sedentary time and low physical activity independently worsen cardiometabolic risk, assessing and addressing baseline activity levels is a logical starting point for management. These observations also highlight that the central clinical challenge is frequently not whether exercise is beneficial — the evidence reviewed below indicates that it is — but how to support women in initiating and sustaining it over the long term.

3.2. Metabolic outcomes

Most of the reviewed studies reported a beneficial association between regular physical activity and metabolic outcomes in women with PCOS (Zhang et al., 2023). Improvements in insulin sensitivity and glucose metabolism were the most consistently reported findings. In a systematic review and meta-analysis of 16 RCTs, Patten et al. (2020) demonstrated that vigorous-intensity aerobic exercise and resistance training both produced moderate reductions in the homeostatic model assessment of insulin resistance (HOMA-IR) compared with control conditions, with vigorous-intensity exercise appearing to yield greater benefits for cardiorespiratory fitness and body composition. Notably, these effects were frequently observed independently of substantial weight loss, suggesting a direct metabolic effect of exercise beyond caloric expenditure.

High-intensity interval training (HIIT) has received particular attention in recent years as a time-efficient alternative to continuous aerobic exercise. A systematic review and meta-analysis of seven trials ($n = 423$) by dos Santos et al. (2021) found that HIIT significantly reduced HOMA-IR and body mass index (BMI), although the certainty of evidence was low, reflecting small sample sizes and short intervention periods (typically 10–16 weeks). Consistent with this, Kogure and Lara (2021) reviewed evidence indicating that HIIT effectively reduces fasting insulin levels and improves glucose tolerance, and a randomised controlled trial by Almenning et al. (2015) found that both high-intensity interval training and strength training over 10 weeks improved insulin sensitivity and lipid profiles in women with PCOS.

Beyond glycaemic measures, broader cardiometabolic benefits have been reported. In a meta-analysis of 14 studies involving 617 women, Benham et al. (2018) found that exercise improved lipid profiles and reduced waist circumference, systolic blood pressure, and fasting insulin, supporting a favourable effect on overall cardiovascular risk. Changes in body composition were also commonly described, with reductions in total body weight, BMI, and waist circumference reported across studies (Szczuko et al., 2021; Palomba et al., 2008; Pandit et al., 2022). The magnitude of these changes differed considerably depending on the intensity and duration of exercise programmes, as well as baseline participant characteristics such as BMI and degree of insulin resistance. A number of authors noted that even modest reductions in body weight (5–10%) were associated with clinically meaningful improvements in metabolic and reproductive parameters in overweight and obese women with PCOS (Moran et al., 2013).

There is also preliminary evidence that exercise may attenuate the chronic low-grade inflammation characteristic of PCOS. In a pilot study, Pandit et al. (2022) reported improvements in body composition and insulin resistance together with reductions in high-sensitivity C-reactive protein (hs-CRP) following exercise training, although the small sample size warrants cautious interpretation. Taken together, the metabolic literature indicates that physical activity exerts consistent and clinically relevant benefits on insulin sensitivity and cardiometabolic risk, frequently independent of weight change.

In addition to glycaemic and anthropometric changes, exercise improves cardiorespiratory fitness, an independent predictor of cardiovascular and all-cause mortality, with vigorous-intensity protocols generally producing the largest gains (Patten et al., 2020). Given the elevated long-term cardiovascular risk associated with PCOS (Teede et al., 2023), these fitness and cardiometabolic improvements are likely to be clinically meaningful even when accompanying changes in body weight are modest, reinforcing the value of exercise as a risk-reduction strategy in its own right.

3.3. Hormonal outcomes

With regard to hormonal outcomes, several authors reported decreases in circulating androgen levels and increases in SHBG concentrations following exercise interventions. In a comprehensive systematic review, Shele et al. (2020) found that aerobic exercise of moderate-to-vigorous intensity was associated with reductions in free and total testosterone, accompanied by increases in SHBG. These hormonal changes were often accompanied by a reduction in clinical features of hyperandrogenism, including hirsutism and acne, which are among the symptoms most distressing to patients.

The mechanisms underlying exercise-induced reductions in androgen excess are thought to involve improvements in insulin sensitivity, as hyperinsulinaemia stimulates ovarian androgen production and suppresses hepatic SHBG synthesis (Harrison et al., 2011). By reducing insulin resistance, exercise may therefore indirectly lower the androgenic milieu characteristic of PCOS. Additionally, some evidence suggests that exercise may directly influence gonadotropin secretion patterns, contributing to improved hormonal balance (Kogure & Lara, 2021).

It should be noted that not all studies reported statistically significant hormonal changes. The heterogeneity of exercise protocols — varying in type, intensity, frequency, and duration — makes direct comparisons challenging, and the hormonal response to exercise may differ according to baseline androgen levels and the phenotypic subtype of PCOS (Shele et al., 2020). This phenotypic variability reinforces the case for individualised, rather than uniform, exercise recommendations.

3.4. Reproductive outcomes

Physical activity was additionally linked to improved menstrual cycle regularity and ovulatory function in several reviewed studies. In an early but influential pilot study, Palomba et al. (2008) demonstrated that a structured exercise training programme improved ovulation and fertility outcomes in obese women with PCOS and anovulatory infertility, with benefits comparable to those of a hypocaloric diet. A systematic review by Kite et al. (2019), including 17 studies, found that exercise — particularly when combined with dietary modification — was associated with improved ovulatory rates in women with PCOS who were overweight or obese.

Meta-analytic evidence is more cautious about quantifying these effects. Benham et al. (2018) reported that there were insufficient data to quantify the impact of exercise on ovulation, although semi-quantitative analysis suggested that exercise interventions may improve menstrual regularity, ovulation, and pregnancy rates. The restoration of menstrual regularity in physically active women with PCOS is likely multifactorial, involving improvements in insulin sensitivity, reductions in androgen levels, and favourable changes in hypothalamic–pituitary–ovarian (HPO) axis function.

Importantly, the relationship between exercise and ovulation may be non-linear. In a systematic review, Hakimi and Cameron (2017) reported that vigorous exercise of approximately 30–60 minutes per day was associated with a reduced risk of anovulatory infertility, whereas very high exercise volumes (exceeding 60 minutes per day) increased the risk of anovulation, particularly in lean women, through energy deficiency and disruption of HPO axis signalling. This suggests a possible dose–response or U-shaped relationship and emphasises the importance of individualised exercise prescription that avoids excessive training loads, especially in women who are not overweight (Teede et al., 2023).

3.5. Psychological well-being and quality of life

A number of studies emphasised the positive influence of physical activity on psychological well-being and health-related quality of life (HRQoL) in women with PCOS. A systematic review by Patten et al. (2021), encompassing 15 articles from 11 trials, reported that exercise demonstrated positive improvements in HRQoL across all included studies, and half of the studies reported significant improvements in symptoms of depression and anxiety following exercise interventions.

The mechanisms by which exercise improves mental health in women with PCOS are not fully established, but are likely to include both direct neurobiological effects (including increases in endorphins, serotonin, and brain-derived neurotrophic factor) and indirect effects mediated through improvements in body composition, hormonal balance, and self-efficacy (Kałużna et al., 2022). Several authors have highlighted that the psychological benefits of physical activity may be particularly significant in PCOS, given the high prevalence of body-image concerns and emotional distress in this population.

It is important to note that most reviewed studies did not examine mental health as a primary outcome, and methodological quality varied considerably. Nonetheless, the consistency of positive findings across multiple study designs provides reasonable support for the beneficial role of exercise on psychological outcomes in women with PCOS (Woodward et al., 2020; Patten et al., 2021).

3.6. Comparison of exercise modalities

The reviewed evidence allows tentative comparison of the principal exercise modalities, although direct head-to-head trials remain limited. Aerobic, or moderate-intensity continuous, training is the most extensively studied modality and reliably improves insulin sensitivity and cardiorespiratory fitness (Patten et al., 2020; Shele et al., 2020). Resistance training improves body composition and insulin sensitivity and may contribute to favourable hormonal changes, and is often recommended in combination with aerobic exercise (Almenning et al., 2015; Szczuko et al., 2021).

HIIT has attracted particular interest as a time-efficient option, with meta-analytic evidence indicating reductions in HOMA-IR and BMI (dos Santos et al., 2021). However, its superiority over moderate-intensity training is not firmly established: in a systematic review comparing higher- and moderate-intensity prescriptions, Richards et al. (2021) concluded that moderate-intensity steady-state exercise was at least as effective, and possibly superior, for improving cardiorespiratory fitness and BMI in women with PCOS. Combined aerobic and resistance programmes may offer the broadest range of benefits (Szczuko et al., 2021), while mind–body interventions such as yoga show promise for psychological outcomes, although the supporting evidence base is less mature (Szczuko et al., 2021).

As summarised in Table 1, no single modality is clearly superior across all outcomes, and effective interventions in the literature are typically characterised by a minimum duration of about 12 weeks and a frequency of three or more sessions per week. The choice of modality should therefore be guided by the individual patient's goals (metabolic, reproductive, or psychological), preferences, fitness level, and comorbidities, in order to maximise both efficacy and long-term adherence.

Table 1. Overview of the principal exercise modalities studied in women with PCOS.

Modality	Typical protocol	Principal reported benefits	Key evidence
Aerobic / moderate-intensity continuous	≥150 min/week moderate intensity (e.g., brisk walking, cycling)	Improved insulin sensitivity and cardiorespiratory fitness; reduced androgens at moderate-to-vigorous intensity	Patten et al. (2020); Shele et al. (2020)
Resistance training	2–3 sessions/week targeting major muscle groups	Improved body composition and insulin sensitivity; possible hormonal benefit	Almenning et al. (2015); Szczuko et al. (2021)
High-intensity interval training (HIIT)	Repeated short high-intensity bouts; time-efficient	Reduced HOMA-IR and BMI; not clearly superior to moderate-intensity training	dos Santos et al. (2021); Richards et al. (2021)
Combined aerobic + resistance	Aerobic plus resistance exercise, ≥12 weeks	Broad metabolic and body-composition benefits	Szczuko et al. (2021)
Mind–body (e.g., yoga)	Yoga or other mind–body practice	Improved psychological well-being; emerging metabolic data	Szczuko et al. (2021)

BMI, body mass index; HIIT, high-intensity interval training; HOMA-IR, homeostatic model assessment of insulin resistance.

3.7. Mechanisms underlying the benefits of exercise

The metabolic benefits of exercise in PCOS are thought to arise largely from enhanced insulin sensitivity. Regular physical activity reduces visceral adiposity and increases skeletal-muscle glucose uptake, thereby lowering circulating insulin concentrations (Hakimi & Cameron, 2017; Harrison et al., 2011). Because hyperinsulinaemia is a key driver of ovarian androgen excess and of reduced hepatic SHBG production, improvements in insulin signalling produce effects that extend well beyond glucose metabolism.

Through this insulin-mediated pathway, exercise can reduce free androgen levels and raise SHBG, attenuating hyperandrogenic features and supporting the resumption of regular ovulatory cycles (Shele et al., 2020). Exercise may also modulate hypothalamic–pituitary signalling and gonadotropin secretion more

directly, although the precise neuroendocrine mechanisms remain incompletely understood (Kogure & Lara, 2021). The opposing effect of excessive training on the hypothalamic–pituitary–ovarian axis — mediated by energy deficiency — illustrates that the same axis can be either supported or disrupted depending on exercise dose and energy availability (Hakimi & Cameron, 2017).

Additional mechanisms include a reduction in chronic low-grade inflammation, as suggested by decreases in inflammatory markers such as hs-CRP following training (Pandit et al., 2022), alongside improvements in endothelial and autonomic function. The psychological benefits of exercise are likely to be mediated both by neurobiological factors — including the release of endorphins and neurotrophic factors — and by improvements in body composition, self-efficacy, and body image (Kałużna et al., 2022). The convergence of these metabolic, hormonal, inflammatory, and neuropsychological pathways helps to explain why exercise produces benefits across such a broad range of PCOS-related outcomes.

4. Discussion

The findings of this narrative review indicate that physical activity represents an important, evidence-supported component of PCOS management, with benefits spanning metabolic, hormonal, reproductive, and psychological domains. Insulin resistance, which plays a central role in the pathophysiology of PCOS (Harrison et al., 2011), appears to be positively influenced by regular exercise across different modalities. This effect has been demonstrated following aerobic training, resistance training, and high-intensity interval training, with vigorous-intensity protocols often yielding the greatest improvements in cardiometabolic parameters (Patten et al., 2020; dos Santos et al., 2021), even as moderate-intensity training remains highly effective and may be preferable for cardiorespiratory fitness in some analyses (Richards et al., 2021).

Improvements in hormonal balance observed in physically active women with PCOS may partially explain the beneficial effects of exercise on reproductive function. Reduced androgen levels and increased SHBG concentrations have been associated with improved menstrual regularity and a decrease in hyperandrogenic symptoms (Shele et al., 2020), and structured exercise has been shown to improve ovulation in anovulatory women (Palomba et al., 2008; Kite et al., 2019). From a clinical perspective, these changes are particularly relevant for women seeking to restore fertility or to reduce symptoms such as hirsutism and acne, which substantially affect quality of life. At the same time, the non-linear relationship between exercise volume and ovulation (Hakimi & Cameron, 2017) cautions against assuming that more exercise is always better, especially in lean women.

Beyond physiological mechanisms, physical activity appears to exert a meaningful influence on mental health. Given the high prevalence of anxiety and depressive symptoms in this population (Cooney et al., 2017; Brutocao et al., 2018), the psychological benefits of exercise may be as clinically significant as its metabolic effects. The systematic review by Patten et al. (2021) provides the most comprehensive current evidence supporting this view, reporting consistent improvements in HRQoL and frequent improvements in depression and anxiety symptoms.

An important and recurring finding is that the metabolic benefits of exercise in PCOS can occur independently of significant weight loss (Patten et al., 2020). This has practical implications, as it suggests that physical activity should be recommended as a therapeutic intervention regardless of weight-reduction goals. It also highlights the importance of focusing on health-related fitness and functional outcomes, rather than weight alone, when designing exercise programmes and when communicating goals to patients — an approach that may also reduce the weight-centric messaging that can exacerbate body-image distress.

With respect to exercise prescription, international clinical guidelines for PCOS recommend at least 150 minutes of moderate-intensity or 75 minutes of vigorous-intensity physical activity per week, in line with general population recommendations, with additional benefit from incorporating muscle-strengthening activity (Teede et al., 2023). Given the specific metabolic and hormonal profile of women with PCOS, however, individualised prescription that considers fitness level, phenotype, comorbidities, and personal preferences appears warranted. The principles of frequency, intensity, time, and type (FITT) provide a useful framework for tailoring programmes, and a gradual, progressive approach is likely to support both safety and adherence.

Physical activity is most effective when delivered as part of a comprehensive lifestyle approach. Combining exercise with dietary modification appears to enhance both metabolic and reproductive outcomes, and lifestyle interventions overall are supported as first-line therapy by systematic review evidence (Lim et al., 2019; Kite et al., 2019; Szczuko et al., 2021). Even modest weight loss of 5–10% achieved through combined diet and exercise can produce clinically meaningful improvements in overweight and obese women (Moran et

al., 2013); however, as emphasised above, exercise also confers benefits in the absence of weight change and should not be framed solely as a weight-loss tool.

Adherence is, in fact, a critical determinant of real-world effectiveness. Women with PCOS may face particular barriers to sustained physical activity, including time constraints, low baseline fitness, fatigue, weight-related stigma, and body-image concerns; survey-based research has examined these barriers as well as the motivators and sources of support that influence physical activity uptake in this group (Banting et al., 2014). Strategies that improve motivation and self-efficacy, provide structured support, and accommodate individual preferences are therefore essential. Supervised programmes can enhance exercise quality and accountability, whereas home-based and remotely delivered interventions may improve accessibility; the growing availability of digital and mobile health tools offers a promising avenue for extending support beyond clinical settings, although robust evidence specific to PCOS is still developing.

The applicability of current evidence to all women with PCOS is limited by the under-representation of certain subgroups. Adolescents, who may benefit from early intervention to modify long-term cardiometabolic and reproductive trajectories, and lean women with PCOS, in whom insulin resistance can occur despite a normal body weight, are both insufficiently studied. Because the reproductive response to exercise may differ in lean women — in whom excessive training carries a greater risk of disrupting ovulation (Hakimi & Cameron, 2017) — extrapolating findings from predominantly overweight and obese cohorts should be done with caution.

Several limitations of the underlying evidence base should be acknowledged. Exercise protocols vary widely in modality, intensity, duration, and frequency, and many studies involve relatively small samples, short intervention periods, and a lack of blinding. Participant heterogeneity — including variation in PCOS phenotype, BMI, and degree of insulin resistance — further complicates comparisons between studies. The present review is also subject to the inherent limitations of narrative methodology, including the absence of a formal quality appraisal and the potential for selection bias. These factors should be taken into account when interpreting the consistency of the reported benefits.

Future research should prioritise adequately powered, well-designed randomised controlled trials with standardised, clearly reported exercise interventions and outcome measures, including direct comparisons between modalities and phenotype-specific analyses. Studies examining long-term adherence and durability of benefit, the integration of digital delivery, and outcomes in under-represented subgroups such as adolescents and lean women would be especially valuable for translating the existing evidence into clear, individualised clinical recommendations.

5. Conclusions

Based on current evidence, regular physical activity should be regarded as an essential element of non-pharmacological approaches to the management of polycystic ovary syndrome. Exercise has the potential to improve metabolic and hormonal parameters — including insulin sensitivity, body composition, lipid profiles, androgen levels, and SHBG concentrations — while also enhancing menstrual cycle regularity, ovulation, psychological well-being, and health-related quality of life. These benefits appear to occur across different exercise modalities and frequently independently of substantial weight loss, with vigorous- and moderate-intensity training each showing particular strengths for specific outcomes.

Incorporating structured physical activity into treatment strategies may therefore contribute to more comprehensive and patient-centred care for women with PCOS. Clinicians should routinely assess physical activity levels, deliver individualised exercise recommendations that take account of phenotype, comorbidities, and personal preferences, and actively support long-term adherence. Future research should focus on determining optimal and phenotype-specific exercise protocols, examining long-term outcomes, evaluating digitally delivered interventions, and investigating the effects of exercise in under-represented subgroups such as adolescents and lean women with PCOS.

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