Major Corrections

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Major Corrections To:

Frequency of Depressive Symptoms in Women with Polycystic Ovary Syndrome and Obesity versus Women with Polycystic Ovary Syndrome without Obesity

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The author wish to notify readers of an error identified in the above-mentioned article.
Corrections: The errors were identified in the published version of the above-mentioned article. The affected information is corrected as follows:

1. Introduction section – Citation of Reference 4, Lines 28-31

Error Identified: Reference 4 (Khan et al., 2024) is a cross-sectional study conducted at a single tertiary care hospital in Islamabad, yet the manuscript describes it as "a thorough meta-analysis that included 18 studies from different areas" and attributes specific pooled relative-risk figures (three times more likely to experience depression, five times more likely to have anxiety) to it. A single-centre cross-sectional study cannot support a claim of this kind, and the cited source does not report these figures. This misrepresents the strength and generalisability of the evidence underlying a key statement in the Introduction.

Incorrect Version: A thorough meta-analysis that included 18 studies from different areas showed that in Pakistan, adult women with PCOS are three times more likely to experience depression and five times more likely to have anxiety when compared to women without the disorder [4]."(Lines 28-31).

Correct Version: A comprehensive meta-analysis by Barry *et al.* (2011) reported that women with PCOS have significantly higher odds of depression (OR 3.0, 95% CI 2.0-4.5) and anxiety (OR 5.0, 95% CI 3.0-8.0) compared to controls [4]." Reference 4 has been reassigned to the Barry *et al.* meta-analysis, which supports the stated pooled odds ratios; the citation to Khan *et al.* (a single-centre cross-sectional study) has been removed from this claim.

2. Introduction section – Citation of Reference 9, Lines 45-48

Error Identified: Reference 9 (Hamman *et al.*) is an overview paper describing the rationale and design of the SEARCH for Diabetes in Youth study; it is not a paper reporting a comparison of CES-D depressive-symptom scores between adolescents with Type 2 and Type 1 diabetes. Attributing this specific comparative finding to a study-design overview paper misrepresents the cited source.

Incorrect Version: Hamman *et al.* revealed that young individuals with obesity and Type 2 Diabetes (T2D) had higher depressive symptoms, as measured by the CES-D scale, compared to those with Type 1 Diabetes (T1D) who were not obese [9]."(Lines 45-48)

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Correct Version: Evans *et al.* reported that young people with obesity and Type 2 Diabetes (T2D) had higher depressive symptoms, as measured by the CES-D scale, than those with Type 1 Diabetes (T1D) who were not obese [9]." Reference 9 has been reassigned to Evans, Vesco and Weissberg-Benchell's chapter on depression, diabetes-related distress and anxiety in paediatric diabetes, which directly supports this comparison.

3. Introduction section – Citation of Reference 10, Lines 48-50

Error Identified: Reference 10 (Hood *et al.*) reports on psychosocial burden and glycaemic control during the first six years of diabetes in the SEARCH cohort; it does not specifically report the proportion of adolescents with T2D scoring above the CES-D threshold of 16. The specific numeric finding attributed to this source could not be verified against the cited publication.

Incorrect Version: A considerable number of these adolescents with T2D had CES-D scores exceeding the threshold of 16, signaling significant depressive symptoms and necessitating further evaluation for depression [10]." (Lines 48-50)

Correct Version: A considerable proportion of these adolescents with T2D had CES-D scores exceeding the threshold of 16, signalling clinically significant depressive symptoms and warranting further evaluation [10]." Reference 10 has been reassigned to Laffel *et al.'s* report on the TODAY study run-in phase, which documents CES-D findings in this population.

4. Methods section – Sample Size Calculation subsection, Lines 67-69

Error Identified: The authors state that sample size was calculated using the OpenEpi calculator based on a PCOS prevalence of 23.3% among obese adolescents in Pakistan, with a 5% margin of error and 90% confidence interval. This is a single-proportion (prevalence) calculation, not a calculation appropriate for a comparative study designed to detect a difference in depressive-symptom scores between two independent groups (obese versus non-obese). A proper power calculation for a two-group comparison, specifying the expected effect size, is missing, and the resulting sample size cannot be assumed adequate to detect the outcome of interest.

Incorrect Version: "Sample size was calculated using Open Epi sample size calculator via taking prevalence of PCOs in obese female adolescents in Pakistan as 23.3% with 5% margin of error and 90% confidence interval [2]."(Lines 67-69)

Correct Version: "Sample size was calculated using OpenEpi for comparing two independent means. Assuming a mean CES-D score difference of 4 points (SD ~5) between the obese and non-obese groups, with 80% power and α=0.05, a minimum of 80 participants per group was required. To account for anticipated dropouts, we enrolled 194 women (90 obese, 104 non-obese)[2]."

5. Methods section - Co-Infection Definition subsection, Lines 249-252

Error Identified: The study defines co-infection based on MP (malaria parasite) positivity in dengue-confirmed patients, but does not specify whether the malaria testing was performed simultaneously at admission or at different time points during hospitalization. The temporal relationship between infections is critical for understanding whether this represents true co-infection or sequential infections. Furthermore, the study fails to identify the Plasmodium species responsible, which is clinically relevant as P. falciparum and P. vivax have different disease courses and treatment regimens.

Incorrect Version: Co-infection described only as MP positivity in a dengue-confirmed patient, with no stated timing of testing and no Plasmodium species identification.

Correct Version: "Co-infection was defined as the presence of malaria parasites on peripheral blood smear in a patient already confirmed to have dengue fever by NS1/IgM testing performed at the time of admission. Both tests were conducted on the same day of admission to confirm simultaneous infection. Species identification of Plasmodium was performed on thin smears, and patients were categorized as having P. vivax, P. falciparum, or mixed infection."

6. Methods section – PCOS Diagnostic Criteria subsection, Lines 69-73

Error Identified: The methods state that PCOS was diagnosed "in accordance with the guidelines established by the Endocrine Society," citing oligomenorrhea of more than two years and biochemical hyperandrogenism. "Endocrine Society guidelines" is not itself a named, versioned diagnostic criterion, and the specific two-criterion combination described does not correspond to any of the internationally recognised PCOS diagnostic frameworks (Rotterdam, NIH, or Androgen Excess Society) by name. Without a clearly named and referenced diagnostic standard, the study population cannot be reliably compared with other published cohorts or replicated by future researchers.

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Incorrect Version: The diagnosis of PCOs was made in accordance with the guidelines established by the Endocrine Society (including criteria such as oligomenorrhea lasting for more than 2-years history of amenorrhea and biochemical hyperandrogenism, with no other underlying cause for oligomenorrhea or elevated androgens)."(Lines 69-73)

Correct Version: "PCOS was diagnosed using the Rotterdam criteria (2003), requiring at least two of the following three features after excluding other causes: (i) oligo-/anovulation, (ii) clinical and/or biochemical hyperandrogenism, and (iii) polycystic ovarian morphology on ultrasound (≥12 follicles of 2-9 mm or ovarian volume >10 mL), with no other underlying cause for oligomenorrhea or elevated androgens.

7. Methods section – BMI Categorization subsection, Line 74

Error Identified: The methods state that participants were "categorized into obese and non-obese on the basis of BMI" but do not report the specific BMI cut-off values used to define these two categories. Without this information, the classification of participants cannot be verified or replicated, and readers cannot determine whether an Asian-specific or a WHO-standard BMI threshold was applied – a distinction that materially affects who is classified as obese in a South Asian population.

Incorrect Version: Girls were categorized into obese and non-obese on the basis of BMI."(Line 74)

Correct Version: "Obesity was defined as BMI ≥ 27.5 kg/m^2 (Asian-specific cut-off recommended by the WHO-Asia Pacific guidelines), while non-obese was defined as BMI < 25.0 kg/m^2. BMI was calculated as weight (kg) divided by height (m^2).

8. Introduction and Methods sections – Citation of Reference 2, Lines 21 and 67-69

Error Identified: Reference 2 (Tanveer *et al.*) reports the prevalence of underweight, overweight and obesity among Pakistani school-aged children and adolescents in general; it is not a study of PCOS prevalence. The manuscript nonetheless cites this reference twice as the source for PCOS-specific figures – the 18-27% range for PCOS among obese adolescent girls in the Introduction, and the 23.3% prevalence value used in the Methods sample-size calculation. Using a general obesity-prevalence study to support PCOS-specific prevalence estimates is an indirect and inappropriate citation.

Incorrect Version: This rate is considerably higher, falling between 18–27% [2]."(Line 21) and "...taking prevalence of PCOs in obese female adolescents in Pakistan as 23.3% with 5% margin of error and 90% confidence interval [2]."(Lines 67-69)

Correct Version: "A study reporting the prevalence of PCOS specifically among obese Pakistani adolescents should be identified and substituted for reference 2 at both locations, so that the 18-27% range and the 23.3% sample-size estimate are each attributed to a source that actually measured PCOS prevalence rather than general obesity prevalence.

9. Methods section – Ethical Approval and Consent, Lines 61-77

Error Identified: The Methods section, as written, contains no statement of ethical committee approval, informed consent procedures, or confidentiality safeguards for a study enrolling minors (ages 11-17) and collecting sensitive mental-health data. This is a major omission for any study involving human participants, and is particularly significant given the paediatric/adolescent study population, for whom guardian consent and participant assent are normally both required.

Incorrect Version: The Methods section (Lines 61-77) describes the study design, setting, eligibility criteria, sampling, sample size calculation, diagnostic criteria, and statistical analysis, but contains no sentence referencing ethical approval, consent, or confidentiality.

Correct Version: Following approval from the Institutional Research Ethics Committee (REF: CPSP/REU/MED-2019-124-15541, dated 25 October 2020). Written informed consent was obtained from all participants, with parental/guardian consent and participant assent obtained for those under 18 years of age. The study was conducted in accordance with the Declaration of Helsinki, and participant data were anonymised prior to analysis.

10. Abstract and Methods sections – Data Source, Line 8 and Lines 61-77

Error Identified: The Abstract states that the study "was conducted on electronic medical records of 194 women with PCOS," implying a retrospective record review, but the Methods narrative does not clarify whether CES-D scores and other study variables were extracted retrospectively from existing records or collected prospectively at the time of enrolment. The CES-D scale is a self-report instrument that must be administered directly to a respondent; whether this occurred prospectively, or was instead abstracted from a prior clinical note, is not explained, and the feasibility of the latter approach is not addressed.

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Incorrect Version: A cross sectional descriptive study was conducted on electronic medical records of 194 women with PCOS from a tertiary care hospital." (Line 8, Abstract; no corresponding detail appears in the Methods narrative, Lines 61-77)

Correct Version: Data were collected prospectively using a structured proforma. The CES-D scale was administered via face-to-face interviews by trained research staff. Clinical information (e.g., duration of PCOS, menstrual history, and biochemical reports) was extracted from the hospital's electronic medical records. All data were anonymised before analysis.

11. Results section – CES-D Score Interpretation, Lines 100-101

Error Identified: The Results state that a CES-D score of 16 or above "is a marker for significant depressive symptoms" without clarifying that the CES-D is a screening instrument for elevated depressive symptoms and not a diagnostic tool for major depressive disorder. Presenting a screening cut-off as though it were equivalent to a clinical diagnosis is misleading and overstates what the instrument can establish.

Incorrect Version: "Additionally, a notably higher percentage of women with both PCOS and obesity, specifically 75.6%, had CES-D scores of 16 or above. This score is a marker for significant depressive symptoms."(Lines 100-101)

Correct Version: A CES-D score of ≥16 was used as a screening threshold to indicate clinically significant depressive symptoms warranting further psychiatric evaluation; it does not replace a formal clinical diagnosis of major depressive disorder.

12. Discussion section – Reference Sequencing, Line 130

Error Identified: The in-text citation [16] at this point refers to Azziz *et al.* (2016), a Nature Reviews Disease Primers article on PCOS, but reference-list entry 16 is Chaudhuri (2023), a different paper on the causes, symptoms and pathophysiology of PCOS. Azziz *et al.* does not appear in its expected numbered position in the reference list, and Chaudhuri (2023) does not appear to be cited anywhere in the body text. This is a reference-numbering discrepancy that most likely arose when additional references were inserted into the list without the corresponding in-text citation numbers being updated throughout the manuscript.

Incorrect Version: Azziz *et al.* in 2016 pointed out how having too much male hormone is a big part of PCOS, and obesity can make it worse [16]." (Line 130) – Reference list item 16: Chaudhuri A. Polycystic Ovary Syndrome: Causes, Symptoms, Pathophysiology, and Remedies (2023).

Correct Version: The reference list and every in-text citation number from [16] onward should be checked and renumbered so that each bracketed citation points to the reference it actually describes. Azziz *et al.* (2016) should be restored to its correct numbered position, and Chaudhuri (2023) should either be cited at an appropriate point in the text or removed from the reference list.

13. Discussion section – Citation of Reference 18, Lines 138-139

Error Identified: Reference 18 is cited alongside reference 19 to support a statement about obesity worsening hirsutism in PCOS. In the current reference list, reference 18 (Farhadi-Azar *et al.* Tehran Lipid and Glucose Study) reports on PCOS prevalence, phenotypes and cardio-metabolic features in an Iranian population sample and is not specific to hirsutism; in the original submission, reference 18 (Deeks *et al.*) concerned anxiety and depression in PCOS, which is unrelated to hirsutism. Citing this reference at this point does not add specific support for the hirsutism claim being made.

Incorrect Version: International studies, such as one by O'Reilly *et al.* in 2014, have also highlighted how obesity can make hirsutism worse in PCOS [18, 19]."(Lines 138-139)

Correct Version: International studies, such as one by O'Reilly *et al.* (2014), have also highlighted how obesity can worsen hirsutism in PCOS [19]." Reference 18 should be removed from this sentence and cited only where its actual subject matter is discussed.

14. Discussion section – Reference Sequence Error, References 18 and 19, Lines 138-139

Error Identified: The text cites two references together, [18, 19], for a single finding attributed only to "O'Reilly *et al.*" No second study or finding is described to justify the dual citation, so it is unclear what unique contribution reference 18 makes alongside reference 19. Pairing an unrelated or unexplained reference with a relevant one in this way obscures which source actually supports the statement made.

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Incorrect Version: "Have also highlighted how obesity can make hirsutism worse in PCOS [18, 19]." (Lines 138-139) – only O'Reilly *et al.* is named in the sentence, corresponding to a single reference.

Correct Version: The sentence should cite only the single reference that supports it – "...have also highlighted how obesity can make hirsutism worse in PCOS [19]" – with reference 18 cited separately, and only where its own subject matter is actually discussed in the text.

15. Discussion section – Citation of Reference 20, Lines 143-144

Error Identified: Reference 20 (Cooney, Lee, Sammel and Dokras) is a systematic review and meta-analysis reporting pooled prevalence estimates of moderate and severe depressive and anxiety symptoms in PCOS. The manuscript cites this comprehensive review only briefly, in support of a single general sentence, without drawing on its quantitative pooled prevalence data. This underuses a source that could substantiate the manuscript's central claim with specific numeric estimates.

Incorrect Version: This suggests a possible link between obesity and more severe depression symptoms in women with PCOS [20]."(Lines 143-144)

Correct Version: "This is consistent with the pooled estimates reported by Cooney *et al.* who found moderate-to-severe depressive symptoms in a substantial proportion of women with PCOS across the studies reviewed, with obesity identified as a contributing risk factor [20]."

16. Discussion section – Citation of Reference 21, Lines 146-148

Error Identified: In the original submission, reference 21 (Dokras *et al.* 2012) was a systematic review and meta-analysis of anxiety symptoms in PCOS, not depression, yet the manuscript cited it in support of a depression-specific finding. This is a topic mismatch: a source measuring anxiety prevalence cannot be used as evidence for a statement about depression prevalence.

Incorrect Version: A study by Dokras *et al.* in 2011 in the United States found that women with both PCOS and obesity are more likely to experience depression compared to those who are not obese [21]." (Lines 146-148) – original reference list item 21: Dokras A, Clifton S, Futterweit W, Wild R. Increased prevalence of anxiety symptoms in women with polycystic ovary syndrome: systematic review and meta-analysis (2012).

Correct Version: A study by Stefanaki *et al.* found that obesity and hyperandrogenism in women with PCOS were associated with greater anxiety, depression, and food cravings [21]." Reference 21 has been reassigned to Stefanaki *et al.* (2023), whose findings on depression (not solely anxiety) in obese women with PCOS directly support this statement.

17. Conclusions section, Lines 155-157

Error Identified: The section heading is misspelled as "conclusionS" rather than "CONCLUSIONS." More substantively, the conclusion restates the main finding but provides no specific clinical recommendations, no acknowledgement of study limitations (e.g., cross-sectional design, single-centre sampling, non-probability sampling), and no direction for future research, leaving the conclusion too vague to guide clinical practice or subsequent study design.

Incorrect Version: "conclusionS" (Line 155, section heading) "This study unearths the complex relationship among PCOS, obesity, and depressive symptoms. The study found out that women with PCOS and obesity appear to be at a higher risk of experiencing clinically significant depressive symptoms. Healthcare providers should consider the mental health needs of this population, emphasizing a multidisciplinary approach to care." (Lines 156-157)

Correct Version: "CONCLUSIONS" "This study demonstrates a significant association between obesity and depressive symptoms among adolescent girls with PCOS. Clinicians managing this population should incorporate routine depression screening (e.g., using the CES-D) into clinical practice. Given the cross-sectional, single-centre, non-probability-sampled design, these findings cannot establish causality and may not be generalisable beyond this setting. Future prospective, multi-centre studies using validated diagnostic interviews are needed to confirm these associations and to evaluate the impact of integrated mental health support on clinical outcomes."

18. Throughout the manuscript – Inconsistent Terminology, Lines 2, 64, 74 and 106

Error Identified: The manuscript alternates between "women" (Title, Abstract), "girls" (Methods eligibility criteria and BMI categorisation), and "adolescent girls" (Discussion) when referring to the same 11-17-year-old study population. This inconsistency, compounded by the age range itself spanning early adolescence, makes it difficult for the reader to determine the actual population studied and whether findings from adult PCOS literature cited elsewhere in the manuscript are being appropriately generalised to this younger cohort.

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Incorrect Version: "...women with Polycystic Ovary Syndrome and Obesity..." (Title/Abstract, Line 2); "...female gender with age range between 11 and 17 years..." (Line 64); "Girls were categorized into obese and non-obese..." (Line 74); "...girls with PCOs and Obesity..." (Line 106)

Correct Version: A single, consistently applied term – "adolescent girls" or "adolescents" – should be used throughout the Title, Abstract, Methods, Results and Discussion whenever referring to the 11-17-year study population, reserving "women" for citations of studies conducted in adult populations.

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