

Introduction

Telehealth has transformed healthcare by using digital technology to connect patients and doctors remotely, eliminating the requirement of travel. During the beginning of COVID-19, 37% of adults used telemedicine in the 12 months before January 2021-December 2021. This remained steady in the following years, with a 2024 study showing that 38.78% reported having a telehealth visit in the previous year (Spaulding et al., 2024). Endocrinology, unlike other medical fields, is uniquely often dependent on data rather than physical in-person exams (Vimalananda et al., 2022).

The gap of knowledge that exists is whether the impact of telehealth on endocrine diseases such as PCOS has led to a higher-quality of life and improved hormone control for women post COVID-19. The rationale of this study is to analyze the efficacy of telehealth and to what extent it successfully improves clinical outcomes for women with PCOS.

Objectives

The short-term goals of this study are to examine the clinical outcome in women with PCOS by measuring testosterone levels to track hormonal control. The central hypothesis is that telehealth care is just as effective as traditional in person doctor visits for helping women with PCOS lower their testosterone levels to manage their condition.

Methods

This study utilized a dataset from the National Health and Nutrition Examination Survey (NHANES) which was conducted by the Centers for Disease Control and Prevention (CDC). The dataset recorded telehealth utilization, whether the participant has had an appointment with a doctor, nurse, or health professional via video conference or phone in the past 12 months in 2021-2023 (CDC), and a Total Testosterone Test. Country-level data was filtered to focus specifically on data for American Females with normal or elevated testosterone. The data was manually analyzed using Excel to determine if they had normal testosterone from 13-70 ng/dL or elevated testosterone above 70 ng/dL (Labcorp, n.d.). This allowed us to determine how many women had elevated testosterone with telehealth utilization from the participants studied. The testosterone score was used as a measure of hormonal control because it tends to be higher in women with PCOS who are having difficulty managing their condition.

Results

Among the total sample (N = 3,835), 1,343 patients utilized telehealth services (exposed group) and 2,492 received standard care without telehealth (unexposed group). Overall, 74 patients (1.93%) presented with elevated testosterone levels.

- Prevalence in Exposed Group (Telehealth): 3.28% (44 / 1,343)
- Prevalence in Unexposed Group (No Telehealth): 1.20% (30 / 2,492)
- Prevalence Ratio (PR): 2.72

Patients who utilized telehealth were 2.72 times more likely to have elevated testosterone levels compared to those who did not use telehealth.

Table 1. Association Between Telehealth Utilization and Testosterone Level Status

	Normal Testosterone	Elevated Testosterone	Total
Telehealth Yes	1299	44	1343
Telehealth No	2462	30	2492
Total	3761	74	3835

Table 2: Prevalence Rates and Prevalence Ratio of Elevated Testosterone by Telehealth Status

Metric	Value
Exposed Group Prevalence (Telehealth)	3.28%
Unexposed Group Prevalence (No Telehealth)	1.20%
Prevalence Ratio	2.72

Discussion

Telehealth patients were 2.72 times as likely to have elevated testosterone compared to those receiving in-person care (3.28% vs. 1.20%). However, this does not mean in-person care provides better hormonal management or that telehealth causes high testosterone. Instead, patients seeking out telehealth might be doing so because they suspect a hormone issue or have an easier access to physicians virtually. This can create a selection bias, as virtual platforms may bring in a patient group with higher risk. Without controlling for confounding variables like patient age, symptom severity, or prior lab work, we can not conclude that the care setting affects outcomes. Ultimately, future studies need multivariable models to separate patient motivation from care quality. Additionally, longitudinal studies can be used in the future to compare two points in the patient's life to determine the effectiveness of telehealth over time.

Conclusion

This study investigated the relationship between telehealth usage and testosterone levels to evaluate if telehealth usage is associated with higher rates of elevated testosterone. The findings revealed that telehealth patients had a significantly higher prevalence of elevated testosterone (3.28%) compared to standard care patients (1.20%).

However, these results are limited by unadjusted cross-sectional data, unmeasured clinical confounders, and selection bias from patients actively seeking virtual hormone care. Research in the future should use prospective designs and multivariate regression models controlling for patient demographics to clarify actual clinical risk in virtual care settings.

References

