

Prevalence and Patterns of Dietary Supplements and Herbal Extracts among Subfertile Women: An Analytical Cross-Sectional Study

Azal Sadiq Dawood*

Obstetrics and Gynecology Department, College of Medicine, University of Diyala, Iraq

Email address: azal@uodiyala.edu.iq

Abstract— Background: Subfertility is a considerable reproductive healthiness concern that affects women during reproductive age. This study aimed to estimate prevalence and patterns of dietary supplement/ herb use among women with subfertility. **Methods and patients:** An analytical cross-sectional study was conducted among 200 women with subfertility attended private gynecology clinics and Al-Batool Teaching Hospital, Diyala (Iraq) between January and September 2025. The participants were classified as supplement/herb users or non-users according to their reported use during preceding three months. **Results:** Of 200 participants, 120 (60%) were used dietary supplements/herbs, while 80 (40%) were non-used. Users of supplements/herbs differed significantly from non-users in age, type of subfertility, polycystic ovary syndrome (PCOS), and educational level. Also, polycystic ovary syndrome (PCOS) was found to be more common among users (43.3%) compared to non-users (25%), as was the level of education (50% vs. 30%). The rate of primary subfertility was also higher among users (75% vs. 62.5%). Among users, dietary supplements and herbal extracts accounted for 58% and 42%, respectively. It has been shown that prescribing medications without a prescription was particularly common among herbalists. **Conclusion:** Dietary supplements and herbs were common used among women with subfertility. Both polycystic ovary syndrome and higher educational attainment were independently associated with the use of these supplements. It is essential to consult with gynecologists regarding their potential benefits and interactions with conventional subfertility treatments.

Keywords— Subfertility; polycystic ovary syndrome ; dietary supplement; gynecologists.

I. INTRODUCTION

Subfertility is a widespread reproductive health problem affecting women of reproductive age [1] and the causes may involve unexplained factors, female-related contributors commonly include ovulatory dysfunction, polycystic ovary syndrome (PCOS), tubal disease, endometriosis, diminished ovarian reserve, and endocrine abnormalities. It can have critical psychological, social and financial implications for women and their families have suffered the impact [2,3]. Women undergoing fertility treatment often look for other methods to aid in fertility in addition to medication and other assisted reproductive treatments [4].

Dietary supplements and herbal preparations are frequently taken with the hope that they will help to enhance ovulation, correct nutritional deficiencies, decrease oxidative stress, or increase ovarian or reproductive function [5,6]. These are all commonly used ingredients: myo-inositol, coenzyme Q10, vitamin D, folic acid, folate, melatonin, vitamin C, L-arginine and choline [7,8]. Other herbs, including shatavari, ginseng, Angelica sinensis, Tribulus terrestris and saffron can also be employed [9,10]. There are many reasons for using these products, and some women consult their gynecologists or pharmacists, while others rely on relatives, traditional healers, social media, or their own personal choices [11,12]. Cultural practices and community-based health beliefs are likely to be especially important factors in herbal preparations [13]. In addition, supplements are often used in conjunction with conventional treatment; therefore, detailed knowledge of all supplements used is important [14].

The reproductive effects of dietary supplements is somewhat mixed, studies focusing on myo-inositol has been primarily conducted on the impact of PCOS and insulin resistance [15], and other studies on coenzyme Q10 have concentrated on oxidative stress and ovarian aging [16]. Vitamin D and folate may be clinically relevant only in case of deficiency or if nutritional requirements are present during pregnancy or preconception [17]. However, any evidence of biological plausibility is not necessarily correlated with improved pregnancy or live-birth outcomes. There is also a wide variation in the preparation, dosage, purity and pharmacological activity of herbal products [18]. Understanding the prevalence of dietary supplement use can help gynecologists provide appropriate counseling to patients and knowing potential safety issues, especially if supplements and herbal remedies are combined with prescribed medicine [19]. The purpose of this study was to assess the prevalence and pattern of dietary supplement and herbal preparations use and their correlation with some characteristics of women with subfertility.

II. METHODS

A. Patients and study design

This cross-sectional analysis was conducted with participated of 200 women diagnosed with subfertility attended private gynecology clinics and obstetrics and gynecology wards at Al-Batool Teaching Hospital, Diyala, Iraq. Consecutive samples were taken over an eight-month period, from January to September 2025, after obtaining their informed consent to participate.

Subfertility is defined as the inability to achieve pregnancy after 12 months of regular, unprotected sexual intercourse. Women aged 35 and older may qualify after six months of unsuccessful attempts, according to standard clinical practice.

The participants were divided into two main groups as follows:

- Supplement/Herbs Users Group: Female participants actively taking dietary supplements, herbal extracts for fertility-related reason during the past three months alongside or independent of conventional therapy.
- Non-Users Group: Female participants did not take any dietary supplements or herbs for fertility-related reason during the past three months only treated using conventional medical fertility therapy.

B. Inclusion Criteria

The study included the following eligible women: aged between 18 and 45 years, with a medical history of reduced fertility, who had been trying to conceive for at least 12 months, or for six months if they were 35 years of age or older.

C. Exclusion Criteria

The following participants were excluded: pregnant women, those using dietary supplements exclusively to treat other unrelated medical conditions, and those who declined to participate.

D. Statistical Analysis

All data were analyzed descriptively using SPSS software (version 25), and categorical data were tabulated as frequencies and percentages. The Pearson chi-squared (χ^2) test was used to compare variables, and logistic regression analysis provided adjusted odds ratios with 95% confidence intervals to differentiate independent determinants correlating with dietary supplements/herbs use. A p-value of less than 0.05 was considered statistically significant.

III. RESULTS

Among the 200 women with subfertility included in the study, 120 (60%) reported using dietary supplements or herbal preparations for fertility-related purposes during the previous three months. The remaining 80 participants (40%) reported non-use as shown in Table (1).

TABLE I. Prevalence of supplement/herb use among studied women.

Groups	Frequency (%)
Supplement/Herbs Users	120 (60%)
Non-Users	80 (40%)
Total	200 (100%)

As illustrated in Table (2), the age distribution differed significantly between users and non-users ($p=0.038$). Among users, women aged 20–25 years represented (30%), compared with (17.5%) among non-users. Conversely, women aged 26–30 and 31–35 years represented larger proportions of the non-user group.

Primary subfertility was reported by (75%) of users and (62.5%) of non-users, and secondary subfertility was more

frequent among non-users than users. This difference was statistically significant ($p=0.042$).

Higher education was reported by (50%) of users compared with (30%) of non-users ($p=0.004$). Employment was also more common among users, although the difference did not reach conventional statistical significance (38.3% versus 25.0%; $p=0.051$).

In Table (3), PCOS was independently associated with supplement/herbal preparation use. Women with PCOS had approximately twice the odds of reporting use compared with women without PCOS (adjusted OR 2.15, 95% CI 1.12–4.12; $p=0.021$).

Higher educational level was also independently associated with use (adjusted OR 2.10, 95% CI 1.11–3.98; $p=0.022$). Age below 30 years, primary rather than secondary subfertility, concomitant ovulation induction and higher household income were not statistically significant independent predictors in the adjusted model.

Among 120 users, 70 (58%) were classified as dietary supplement users and 50 (42%) as herbal preparation users as shown in Table (4).

As explain in Table (5), Myo-inositol and coenzyme Q10 were among the most frequently reported dietary supplements 46 (65.7%). Vitamin D 43 (61.4%), vitamin C 38 (65.5%), folic acid 39 (55.7%) and folate 36 (62.1%) were also commonly used. Melatonin 22 (31.4%), L-arginine 18 (31%) and choline 15 (21.4%) were reported less frequently.

As Table (6), Shatavari 48 (96%) was the most frequently reported herbal preparation, followed by other traditional preparations 45 (90%), Angelica sinensis 27 (54%) and ginseng 23 (46%). Saffron 12 (24%) and Tribulus terrestris 9 (18%) were less commonly reported.

TABLE II. Baseline Characteristics comparison between supplement/herb users and non-users groups .

Characteristics	Total (N=200)	Users (n=120)	Non-Users (n=80)	P-value
Age (years)	20–25	50 (25.0%)	36 (30.0%)	0.038*
	26–30	60 (30.0%)	34 (28.3%)	
	31–35	40 (20.0%)	22 (18.3%)	
	36–40	20 (10.0%)	10 (8.3%)	
	> 40	30 (15.0%)	18 (15.0%)	
Subfertility	Primary	140 (70.0%)	90 (75.0%)	0.042*
	Secondary	60 (30.0%)	30 (25.0%)	
Polycystic ovary syndrome	72 (36.0%)	52 (43.3%)	20 (25.0%)	0.008*
Education level (Higher)	84 (42.0%)	60 (50.0%)	24 (30.0%)	0.004*
Employment status (Employed)	66 (33.0%)	46 (38.3%)	20 (25.0%)	0.051
Concomitant ovulation induction	124 (62.0%)	80 (66.7%)	44 (55.0%)	0.093

Among women with PCOS, myo-inositol use was substantially more common than among women without

PCOS (73.1% versus 11.8%; $p < 0.001$). Vitamin D use was also more common among women with PCOS (53.8% versus 22.1%; $p = 0.001$). Folic acid use showed a smaller but statistically significant difference (42.3% versus 25.0%; $p = 0.048$).

TABLE III. Analysis of determinants associated with Supplement/Herb use groups.

Determinants	Adjusted OR (95% CI)	P value
Age < 30 vs ≥ 30 Year	1.62 (0.89 – 2.95)	0.114
Polycystic ovary syndrome diagnosis	2.15 (1.12 – 4.12)	0.021*
Primary vs Secondary subfertility	1.45 (0.76 – 2.78)	0.258
Higher educational level	2.10 (1.11 – 3.98)	0.022*
Concomitant ovulation induction use	1.38 (0.72 – 2.64)	0.328
Higher household income level	1.82 (0.97 – 3.41)	0.061

TABLE IV. Proportions of dietary supplements and herbs use among studied women.

Supplement/Herbs Users	Frequency (%)
Dietary Supplement Users	70 (58%)
Herbal Extract Users	50 (42%)
Total	120 (100%)

TABLE V. Rate of dietary supplements use among studied women

Dietary Supplement	Frequency (%)
Myo-Inositol	46 (65.7%)
Coenzyme Q10	46 (65.7%)
Vitamin D	43 (61.4%)
Vitamin C	38 (65.5%)
Folic Acid	39 (55.7%)
Folate	36 (62.1%)
Melatonin	22 (31.4%)
L-Arginine	18 (31.0%)
Choline	15 (21.4%)

TABLE VI. Rate of herbs use among studied women

Herbal Extract	Frequency (%)
Shatavari	48 (96.0%)
Angelica sinensis	27 (54.0%)
Ginseng	23 (46.0%)
Tribulus terrestris	9 (18.0%)
Saffron	12 (24.0%)
Other traditional preparations	45 (90.0%)

Shatavari use was more frequent among women without PCOS than among those with PCOS (50.0% versus 26.9%; $p = 0.010$). Multiple-supplement use was more common among women with PCOS (69.2% versus 47.1%; $p = 0.016$) as shown in Table (7).

TABLE VII. Analysis of supplement/herb use across polycystic ovary syndrome diagnosis

Supplement / Herb	Polycystic ovary syndrome (PCOS)		p-value
	PCOS (n=52)	Non-PCOS (n=68)	
Myo-Inositol	38 (73.1%)	8 (11.8%)	<0.001*
Vitamin D	28 (53.8%)	15 (22.1%)	0.001*
Folic Acid	22 (42.3%)	17 (25.0%)	0.048*
Shatavari	14 (26.9%)	34 (50.0%)	0.010*
Poly-supplementation (≥ 2 Agents)	36 (69.2%)	32 (47.1%)	0.016*

The source of advice differed markedly between dietary supplement and herbal preparation users. Most dietary supplements were physician-prescribed (82.9%), whereas self-

prescription was the most frequent pattern among herbal users (64%). Herbalists or traditional practitioners accounted for (24%) of herbal recommendations (Table 8).

TABLE VIII. Source of prescription patterns among women using supplements/herbs

Prescribing Pattern	Supplement (n=70)	Herb (n=50)	Total (n=120)
Physician Prescribed	58 (82.9%)	6 (12.0%)	64 (53.3%)
Self-Prescription	8 (11.4%)	32 (64.0%)	40 (33.3%)
Herbalist / Traditional Practitioner	4 (5.7%)	12 (24.0%)	16 (13.3%)

IV. DISCUSSION

This study found that dietary supplement and herbal preparation use was common among studied women with subfertility, as six out of every ten participants reported using at least one complementary product during the preceding three months. This high prevalence suggests that supplement and herbal preparation use is an important component of the lived experience of subfertility in this setting [20,21].

The following clinically relevant information was observed, as women may use these products in addition to other fertility treatment drugs without necessarily informing their treating physicians. This might be due to a wish to have some involvement in treatment, an aversion to long-term subfertility treatment, cultural beliefs, or the advice from other members of the family and/or the perceived lack of options with traditional treatment [22,23].

A major finding was the association between PCOS and supplement/herbal preparation use. It was associated with use in 43.3% of users compared with 25% of the non-users, and this was an independent association after adjustment. The best product-specific correlation was with myo-inositol. More than two-thirds of women with PCOS reported using myo-inositol, compared with a much smaller proportion of women without PCOS. This pattern is understandable because PCOS is frequently associated with irregular menstruation, anovulation, hyper androgenism and insulin resistance [24]. Myo-inositol is commonly promoted as a supportive therapy for metabolic and reproductive manifestations of PCOS [25]. Previous study has explored its possible effects on insulin sensitivity, menstrual regularity and ovulatory function [26]. However, the association observed in the present study should be interpreted as a pattern of targeted use, not as evidence that myo-inositol caused clinical improvement. Women with PCOS may be more likely to receive advice about myo-inositol, search for information about it or choose it because of its perceived relevance to their condition [27].

Vitamin D was also used more frequently by women with PCOS, and this may reflect the frequent assessment or suspicion of vitamin D deficiency in women with metabolic and reproductive disorders [28]. It could also be due to a belief that supplementing with vitamin D helps to balance hormones or reproductive results [29]. Because vitamin D status was not measured in the laboratory in the present study, it was not possible to assess whether supplementations were clinically needed or whether such vitamin D use was recommended [30].

Another finding of importance was the association between higher education and supplement consumption. Women with higher educational attainment had approximately twice the adjusted odds of using supplements or herbal preparations. Education may improve access to health information and increase awareness of complementary treatments [31].

It may also be associated with greater ability to access private healthcare services and purchase commercially available products [32]. Coenzyme Q10 was frequently reported and may be selected by women who are concerned about ovarian aging or oocyte quality [33].

Primary subfertility was more frequent among users than non-users, and this may reflect the fact that women have never achieved pregnancy may actively seek multiple approaches to conception [34]. Many participants used supplements or herbs together with conventional fertility treatment. Although the difference in concomitant ovulation-induction therapy was not statistically significant, two-thirds of supplement/herbal users reported concurrent use. This finding supports the interpretation that many women consider supplements to be complementary rather than alternative treatments [35].

Furthermore, most physicians were prescribing dietary supplements and most people self-prescribed herbal preparations. This separation might imply that within the documented fertility treatments dietary supplements are more likely to be part of formal treatments whereas herbal therapies are closer to personal choice, family advice and traditional use [36,37].

V. CONCLUSION

Dietary supplement and herbal preparation use was common among women with subfertility reporting use during the preceding three months. Myo-inositol and coenzyme Q10 were the most frequently used supplements, while shatavari was common herbal product. Both polycystic ovary syndrome and higher educational level were independently associated with supplement/herbal preparation use. Dietary supplements were usually physician-prescribed, whereas herbal preparations were more frequently self-prescribed or recommended by traditional practitioners. These findings underscore the need for women to take supplemental products regularly, as well as the imperative to inform patients of potential issues and interactions between supplements and traditional gynecologic care, and prompt patients to seek consultation.

REFERENCES

- [1] Rugfoong W, Doungpunta J, Jansaka N, Sanmee U. Knowledge differences on the impact of age on fertility among fertile and subfertile women. *JBRA Assisted Reproduction*. 2025 Apr;29(2):306.
- [2] Neelam YA, Basheer M, Kumar R. An overview on female reproductive disorders. *Nanotherapeutics in the Treatment of Reproductive Disorders*. 2026 Mar 5.
- [3] Rooney KL, Domar AD. The relationship between stress and infertility. *Dialogues Clin Neurosci*. 2018;20(1):41-47.
- [4] Wondrasek T, Boucher E, Dundee J, Ryniec J, Esfandiari N. Fertility care in the age of algorithms: opportunities and risks of AI and social media integration in reproductive medicine. *Journal of Assisted Reproduction and Genetics*. 2026 May 7:1-1.
- [5] Showell MG, Mackenzie-Proctor R, Jordan V, Hodgson R. Antioxidants for female subfertility. *Cochrane Database Syst Rev*. 2020;8(8):CD007807.
- [6] Gaskins AJ, Chavarro JE. Diet and fertility: a review. *Am J Obstet Gynecol*. 2018;218(4):379-389.
- [7] Saleh R, Sallam H, Elsuity MA, Dutta S, Sengupta P, Nasr A. Antioxidant therapy for infertile couples: a comprehensive review of the current status and consideration of future prospects. *Frontiers in Endocrinology*. 2025 Jan 9;15:1503905.
- [8] Pandey C, Maunder A, Liu J, Vaddiparthi V, Costello MF, Bahri-Khomami M, Mousa A, Ee C. The role of nutrient supplements in female infertility: an umbrella review and hierarchical evidence synthesis. *Nutrients*. 2024 Dec 27;17(1):57.
- [9] Lashari S, Khan T, Ali M, Jokhio D, Yahya S. Herbal Supplements and Fertility: A Comprehensive Review. *Journal of Health and Rehabilitation Research*. 2024 May 2;4(2):427-38.
- [10] Mali PC, Yadav P, Bharti N, Kumari S. Role of Plants and Herbal Products to Manage Male Fertility. *Plant-Based Phytochemicals*. 2026 Jul 14;2:237-57.
- [11] Hadadian F, Abbasi M, Parsajam T, Haseli A, Rostami N. Screens and society: how media narratives influence fertility and reshape childbearing choices; a systematic review. *BMC women's health*. 2025 Sep 29;25(1):457.
- [12] Mashaah T, Gomo E, Maradzika JC, Madziyire MG, January J. Experiences of traditional health practitioners in the management of female infertility in Harare urban areas: A qualitative study. *African Journal of Reproductive Health*. 2024;28(1):110-22.
- [13] Hwang JH, Kim YR, Kang D. Factors associated with the use of complementary and alternative medicine for infertility treatment in Korea. *Complement Ther Med*. 2019;47:102213.
- [14] Shukla S, Shrivastava D. Nutritional deficiencies and subfertility: a comprehensive review of current evidence. *Cureus*. 2024 Aug 8;16(8).
- [15] Unfer V, Facchinetti F, Orrù B, Giordani B, Nestler J. Myo-inositol effects in women with PCOS: a meta-analysis of randomized controlled trials. *Endocr Connect*. 2017;6(8):647-658.
- [16] Ben-Meir A, Burstein E, Borrego-Alvarez A. Coenzyme Q10 restores oocyte mitochondrial function and fertility during reproductive aging. *Aging Cell*. 2015;14(5):887-895.
- [17] Cueto HT, Riis AH, Hatch EE, et al. Folic acid supplementation and fecundability: a Danish prospective cohort study. *Eur J Clin Nutr*. 2016;70(1):66-71.
- [18] Weissman A, Adashi EY, Gleicher N. Paying more for no better outcome: the add-on crisis in modern medicine—using infertility treatment as the primary example. *Journal of IVF-Worldwide*. 2026 Apr 23;4(2):1-8.
- [19] Fu Y, Ding DN, Shen Y, Jia LY, Yan MY, Song CH, Han FJ. Complementary and alternative medicine for premature ovarian insufficiency: a review of utilization and mechanisms. *Evidence-Based Complementary and Alternative Medicine*. 2022;2022(1):9053930.
- [20] Kheil MI. Prevalence of dietary supplements and herbs use in female infertility in the Middle East. *Fertil Res Pract*. 2021;7:15.
- [21] Hasan S, Al-Omani S. Infertility and complementary medicine: A cross-sectional study in Iraq. *Middle East J Med*. 2020;12(4):301-309.
- [22] Liyanage A, Godakandage S, Weerasinghe MC. Exploring Treatment-Seeking Behaviors for Subfertility in Sri Lanka: A Qualitative Study. *Women's Reproductive Health*. 2026 Feb:1-5.
- [23] Read SC, Carrier ME, Whitley R, Zekowitz P. Complementary and alternative medicine use in infertility: A qualitative study. *J Altern Complement Med*. 2014;20(9):686-692.
- [24] Teede HJ, Misso ML, Costello MF, et al. Recommendations from the international evidence-based guideline for the assessment and management of polycystic ovary syndrome. *Hum Reprod*. 2018;33(9):1602-1618.
- [25] Facchinetti F, Unfer V, Dewailly D, et al. Inositols in polycystic ovary syndrome: An overview on the advances. *Trends Endocrinol Metab*. 2020;31(6):435-447.
- [26] Placidi M, Casoli G, Tatone C, Di Emidio G, Bevilacqua A. Myo-inositol and its derivatives: their roles in the challenges of infertility. *Biology*. 2024 Nov 16;13(11):936.
- [27] Kamenov Z, Kolarov G, Gateva A, Carlomagno G, Genazzani AD. Ovulation induction with myo-inositol alone and in combination with clomiphene citrate in polycystic ovary syndrome patients with insulin resistance. *Gynecol Endocrinol*. 2015;31(2):131-135.

- [28] Jaafar B, Chami N, Tlais M, Matar M, Obeid N, Taha N, El Haddad K, Abou Chaaya J, Azar S. The Association Between Vitamin D and Polycystic Ovary Syndrome (PCOS) in Women: A Systematic Review. *Nutrients*. 2026 Mar 19;18(6):968.
- [29] Chu J, Gallos I, Tobias A, et al. Vitamin D and assisted reproductive treatment outcome: a systematic review and meta-analysis. *Hum Reprod*. 2018;33(1):65-80.
- [30] Ghareeb OA, Abdulla GM, Sultan AI. Vitamin D Deficiency and risk of COVID-19 infection. *International Journal of Health & Medical Research*. 2024;3(5):181-6..
- [31] Babikir SA, Hamedelniei EI, Elhassan GO, Alfadl AA. The impact of socioeconomic characteristics on Sudanese women's use of traditional, complementary and integrative medicine for self-management of infertility. *BMC Complementary Medicine and Therapies*. 2025 Apr 9;25(1):129.
- [32] Frass M, Strassl RP, Friehs H, Müllner M, Kundi M, Kaye AD. Use and acceptance of complementary and alternative medicine among the general population and medical personnel: a systematic review. *Ochsner J*. 2012;12(1):45-56.
- [33] Akın L, Kurdoğlu M. Effects of coenzyme Q10 on ovarian reserve and oocyte quality. *J Assist Reprod Genet*. 2021;38(9):2205-2212.
- [34] Iwelumor OS, Jamaludin SS, Babatunde KS. Social construction of female infertility1: a qualitative study of women with female factor infertility diagnosis. *Journal of International Women's Studies*. 2022 May 1;24(1):1-1.
- [35] Sehgal S, Dyer A, Warren C, Galic I, Jain T. Integrative medicine utilization among infertility patients. *Reproductive Biology and Endocrinology*. 2023 Aug 2;21(1):71.
- [36] Koshy AK, Anithadevi TS. Prevalence and use of Alternative Medicine Treatments and Supplements in Couples with Infertility: A Cross-Sectional Study. *Journal of Human Reproductive Sciences*. 2025 Nov 17;18(4):218.
- [37] Ofofu-Budu D, Hänninen V. Herbalists' explanations of infertility: The case of Northern and Southern Ghana. *African Journal of Reproductive Health*. 2022 Aug 14;26(5):96-106.