Volume 3, Issue 7, 2025

Frontier in Medical & Health Research

ISSN: (e) 3007-1607 (p) 3007-1593

EVALUATING THE UTILIZATION OF COMPLEMENTARY AND ALTERNATIVE MEDICINE DURING ANTENATAL CARE AMONG WOMEN

Azzah Khadim Hussain[1], Ahmad Ibne Yousaf [*2] Arooj Rahat [3] Dr. Ayesha Bint Yousaf [4] Ufaq Tanveer Butt[5] Anam Tariq [6] Aliha Naeem [7] Qirrat Binte Yousaf [8]

[1] *MPhil. Clinical Nutrition, School of Human Nutrition and Dietetics, Minhaj University Lahore (MUL), Pakistan.*

[2] *MPhil. Clinical Nutrition, School of Human Nutrition and Dietetics, Minhaj University Lahore (MUL), Pakistan.*

[3] *Lecturer, Department of Pharmacology, Khaldunia College of Pharmacy, Kitaas College, University of the Punjab (Affiliated)*

[4] *Resident PGR (Neurosurgery), Department of Neurosurgery, District Hospital Quarters (DHQ), Gujranwala, Pakistan*

[5] *Deputy Director, Drug Regulatory Authority of Pakistan, Lahore (DRAP)*

[6] *MPhil. Pharmacology, Department of Pharmacology, Lahore College for Women University (LCWU), Lahore, Pakistan.*

[7] *BS, Food Science and Human Nutrition, University of Veterinary and Animal Sciences (UVAS), Lahore, Pakistan.*

[8] *Pharma-D Scholar, Department of Pharmacy, Minhaj University, Lahore*

azzah.khadim@gmail.com [1] https://orcid.org/0009-0008-1801-794X
ahmadibneyousaf777@gmail.com [2] arooj1711@gmail.com [3] ayeshabintyousaf26@gmail.com [4]
ufaqtanveerbutt@yahoo.com [5] anamtariq104@gmail.com [6] dietitianaliha2468@gmail.com [7]
sheikhtasneema@gmail.com [8]

DOI: https://doi.org/10.5281/zenodo.17205274

Keywords
CAM, ANC, Mind-body techniques, Alternative medical system, Biological products, Manipulative-body based.

Article History
Received on 29 Aug 2025
Accepted on 8 Sep 2025
Published on 25 Sep 2025

Abstract

Complementary and Alternative Medicine (CAM) includes mind-body practices (e.g., prayer, yoga), alternative systems (e.g., acupuncture, Ayurveda), massage, herbs, and supplements. This study evaluated CAM utilization during antenatal care among 451 pregnant women in Lahore using a cross-sectional survey at two tertiary hospitals. Descriptive results showed that 53.3% of women used at least one CAM modality during pregnancy, with 60% using mind-body therapies and 55% consuming supplements. Most were housewives (65%) and university graduates (57%), with 52.4% showing a positive attitude toward CAM. One-way ANOVA showed a significant difference in CAM use across education levels ($F = 3.95$, $p = 0.008$) and occupation groups regarding biologically based therapies ($F = 3.24$, $p = 0.039$). Factorial ANOVA confirmed education significantly influenced CAM usage ($F = 2.96$, $p = 0.032$), and occupation significantly affected herb use ($F = 4.14$, $p = 0.017$). Chi-square analysis found significant associations between education and CAM use ($\chi^2 = 27.01$, $p < 0.001$),

Volume 3, Issue 7, 2025

Frontier in Medical & Health Research

ISSN: (e) 3007-1607 (p) 3007-1593

Corresponding Author: *
Ahmad Ibne Yousaf

education and attitudes (χ^2 = 31.90, p = 0.001), income and attitudes (χ^2 = 24.85, p = 0.016), and occupation and CAM use (χ^2 = 32.07, p = 0.001) The findings indicate education and occupation strongly influence CAM usage and perceptions during pregnancy. About 52.4% of respondents had positive attitude towards CAM based therapies.

INTRODUCTION

Complementary and alternative medicine also known as techniques and refers as (CAM), which are being practiced as a part of providing optimal care with least side effects but are not a part of country's conventional health care system and are partially recognized as a part of healthcare system. These practices are sometimes used alongside traditional medicine in certain countries. However, CAM is also known as nonconventional or traditional medicine (Tangkiatkumjai, Boardman, & Walker, 2020).

Grenier stated that antenatal care (ANC) is the care provided to the women during pregnancy in order to insure well-being of the mother and the neonate. Also, to reduce maternal and neonatal mortality rates. He mentioned that recent studies indicate a significant increase in CAM use among pregnant women worldwide, Regional disparities in CAM prevalence highlight varying variables such as healthcare practices customs, traditions, cultural and traditional norms which markedly influence pregnant women treatment choices (Grenier et al., 2019).

During antenatal care (ANC), the use of complementary and alternative medicine (CAM) is prevalent among pregnant women, driven by various motivations and cultural beliefs. Research indicates that a remarkable proportion of women utilize CAM during ANC, often in conjunction with conventional medicine, highlighting the need for awareness regarding its efficacy and safety. Research on CAM has expanded dramatically in recent years, with an increasing emphasis on evidence-based practice. Studies have investigated the efficacy, safety, mechanisms, and clinical outcomes associated with various CAM strategies (Ng, Liang, & Gagliardi, 2016).

In Kenya, 50.7% of women reported using CAM during pregnancy, with many preferring it over conventional treatments due to perceived ineffectiveness of standard medicine("Complementary and Alternative Medicine Utilization among Pregnant Women Attending Antenatal Care Clinics in Tongaren Sub-County, Kenya: a Cross-sectional Survey", 2022).A striking 89.36% of pregnant women in Northwest Ethiopia utilized CAM, primarily herbal supplements and spiritual healing (Emiru, Adamu, Erara, Chanie, & Gurmu, 2021)

In India, 48.33% of surveyed women used CAM, with herbal and traditional medicines being the most common Women often turn to CAM for reasons such as ensuring a healthy baby, easing delivery, and boosting immunity(Prasad, S., Agrawal, A., Kanwat, B., Agrawal, C., Sharma, A., & Bhandari, A.,2024)

Despite the widespread use of CAM, many women remain unaware of potential risks and interactions with conventional treatments, underscoring the importance of integrating education on CAM into ANC practices (Emiru, Adamu, Erara, Chanie, & Gurmu, 2021).In Kenya, motivations included a preference for CAM due to its perceived safety and effectiveness("Complementary and Alternative Medicine Utilization among Pregnant Women Attending Antenatal Care Clinics in Tongaren Sub-County, Kenya: a Cross-sectional Survey", 2022).

A recent study by Sharmistha in (2024), stated that (CAM) Complementary and

Frontier in Medical & Health Research

ISSN: (e) 3007-1607 (p) 3007-1593

Alternative Medicine utilization during ANC among women is significant, with 48.33% utilizing it, primarily herbal and traditional medicines, often initiated on advice from relatives or friends, raising concerns about potential adverse effects and drug interactions (Prasad et al., 2024).Another study by Fleet explored ANC education incorporating complementary practices, showed that the women in the intervention group were less likely to use epidurals and more likely to have vaginal births, indicating potential benefits of complementary medicine during antenatal care (Fleet, Adelson, Mckellar, & Steen, 2023).

According to (Makhapila, 2024) Complementary and Alternative Medicine (CAM) utilization during pregnancy in Tongaren Sub-County, Kenya, is prevalent, with 50.7% of pregnant women using CAM. Factors influencing this include marital status, spouse's education, employment status, and household income.

Babbar, Williams and Maulik in (2017) during antenatal care (ANC) the use of Complementary and alternative medicine (CAM) is rising, with 62% of obstetricians advising its use. Effective modalities include massage, yoga, meditation, and biofeedback, though knowledge gaps and safety concerns persist among healthcare providers (Babbar, Williams, & Maulik, 2017).

Riffat Mehboob in (2023) her paper does not specifically address the use of (CAM) during antenatal care. It discusses general CAM usage, reasons for its popularity, and its application in various health issues, but not in the context of ANC (Mehboob, 2023).

Frawley in (2016) stated that Complementary and alternative medicine (CAM) utilization during pregnancy is prevalent, with 91.7% of pregnant women utilizing products based on CAM and 48.1% consulting CAM practitioners, often influenced by personal experiences and health concerns like fatigue and anxiety (J Frawley et al., 2016).

The study found that 89.36% of women in Northwest Ethiopia used complementary and alternative medicine (CAM) during pregnancy, (65.2%) used spiritual healing and herbal supplements accounted for (51.8%), often due to accessibility, cultural beliefs, and perceived benefits (Emiru et al., 2021).

A randomized control trial in Australia found that antenatal education incorporating CAM techniques reduced the likelihood of epidural use and increased vaginal birth rates among low-risk women (Fleet et al., 2023).

Another paper by Butt in (2017) discusses complementary and alternative medicine (CAM) primarily in the context of breast cancer treatment, highlighting the prevalence of CAM use among patients and the challenges clinicians face in addressing patients' preferences for alternative therapies over conventional treatments (Butt, Bull, & Boyce, 2017).

Recommendations from knowledgeable and supportive health professionals on CAM use can positively influence pregnant women's decision making, increasing confidence and perceived safety. Also shared experiences within social networks, including family, friends, and online communities, may influence the decision-making process regarding CAM use in pregnancy (Fjær, Landet, McNamara, & Eikemo, 2020).

Objectives

1. To evaluate the utilization of complementary and alternative medicines by women during antenatal care.
2. To assess the attitude of women towards complementary and alternative medicines usage during antenatal care.

Frontier in Medical & Health Research

ISSN: (e) 3007-1607 (p) 3007-1593

Conceptual Framework

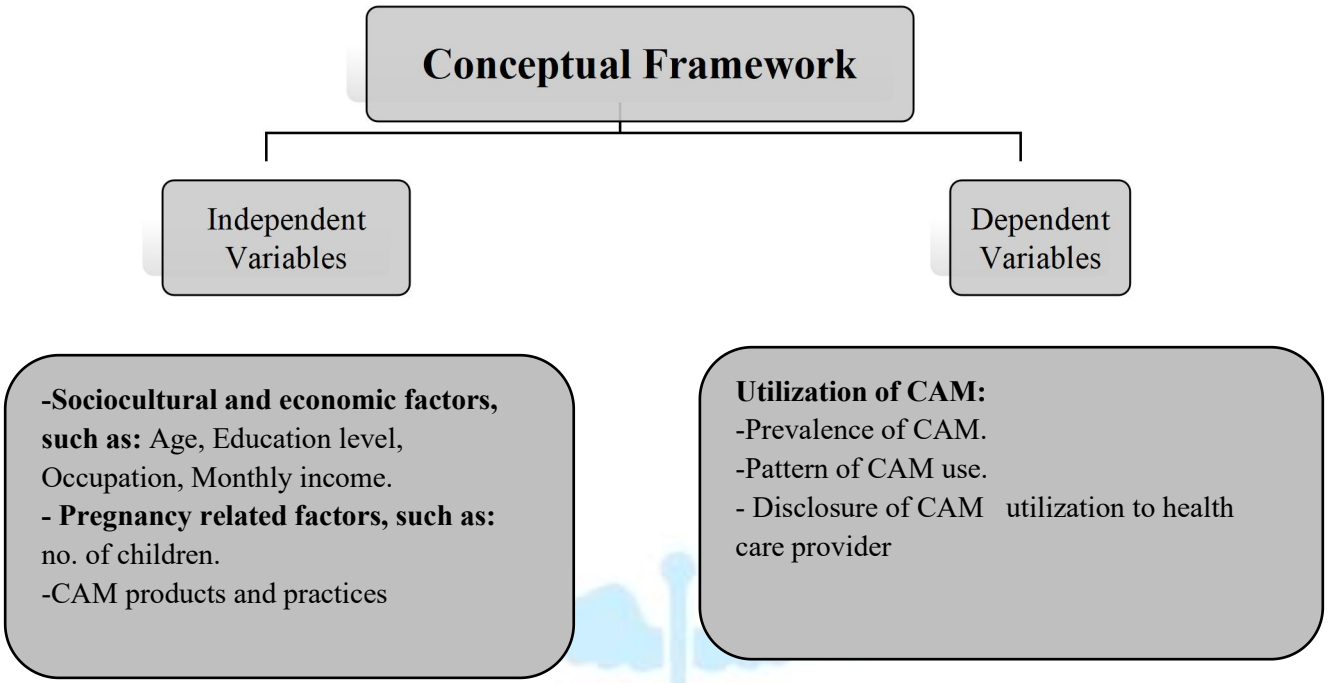

Figure 1. Pictorial representation of the conceptual frame work

Study Hypothesis

H₀ (Null Hypothesis):

-There is no association between the level of education and CAM modalities utilization (Mind-body, Alternative medical system and Massage) during antenatal care among women.

-There is no association between the level of education and biologically based therapies, Pre/ Pro biotics and Omega 3 utilization during pregnancy among women.

-There is no association between Monthly income and Women's attitude towards CAM based therapies usage during pregnancy.

-There is no association between Occupation and biologically based therapies, Pre/ Pro biotics and Omega 3 utilization during pregnancy among women.

Research Methodology

This study is a cross-sectional, descriptive survey study of a mothers selected by a systematic sampling technique and visiting a selected tertiary care hospitals in Lahore.

Selection of Participants

From the initial calculated sample size, 420 pregnant women was planned to be included but the sample size decided to be taken up to 451 in order to accommodate for any missed data or non-response rate. Raosoft is used as a sample size calculator, which is also being used by Quzmar, Istiatieh, Nabulsi, Zyoud, & Al-Jabi (2021) in his study, to measure the sample size, with a pre-determined margin of error 5% with confidence level of 95% (Quzmar, Istiatieh, Nabulsi, Zyoud, & Al-Jabi, 2021).

Frontier in Medical & Health Research

ISSN: (e) 3007-1607 (p) 3007-1593

Inclusion and exclusion criteria

Mothers aged from 18 to 45 years (as it is the most common child bearing age in Pakistan) were included except the sex workers, also only those women were included who provided consent either verbally or written and were receiving ANC services from a selected tertiary care hospitals in Lahore.

The mothers who did not attend school, smokers or suffering from a fetal disease like HIV infection and cancer were excluded from the participation in this research. In addition women who were not receiving ANC services from a selected tertiary care hospitals in Lahore and did not agree for contributing in this study were excluded.

Data collection tools and Procedure

An adopted, modified questionnaire with prior permission from the authors were used, which is being used by (Onyiapat et al., 2017), (J Frawley et al., 2016) and later on by (Quzmar et al., 2021) respectively. The data collected using an adopted questionnaire. Initially, a pilot study was conducted, in order to measure the questionnaire suitability and the respondents' comprehension of the questions. The women who were recruited in this study gave consent for participation, before they were briefed about the purpose of the study, freedom to leave the study at any time, other than that an assurance was given on the confidentiality of their data and privacy. After this, questionnaires were administered to the pregnant women

To ensure the validity and reliability of the data collected, an adapted questionnaire was used for data collection and necessary adjustments were made, including eliminating inadequacies, irrelevance and ambiguities, to ensure the questions were clear, logical and able to measure the variables. An informed consent was obtained from each participant of the study either in verbal or written form. The data collected was confidential and has only been used for the purpose of this research.

Timeframe of the Study

The research data is collected in the time frame of 4 months from pregnant women attending two major tertiary health care settings which are providing ANC services in Lahore, Pakistan. One is Service s hospital, Lahore and the other is Mayo hospital, Lahore.

Independent Variables

-Independent variables included: -Sociocultural and economic factors, such as: Age, Education level, Occupation, Monthly income.

- Pregnancy related factors, such as: no. of children.

Dependent Variables

-CAM products and practices

- Attitude of women towards CAM utilization

Results and discussions

Uni-Variate Analysis

Distribution of respondents according to their socioeconomic characteristics:

Age

Younger Women: A study in Australia found that 91.7% of women aged 18-23 used CAM products, often for issues like fatigue and anxiety (Frawley, 2015).Older Women: In Sri Lanka, women over 35 years showed a high utilization of antenatal care services, which may correlate with a more cautious approach to CAM use due to increased awareness of potential risks (Illangasinghe & Jayaratne, 2023).

Frontier in Medical & Health Research

ISSN: (e) 3007-1607 (p) 3007-1593

According to figure (4.1), majority of the respondents who participated in this study were from the age group (35-40) they accounted for 36% (165) participants', while 27% (120) women aged (30-34), 21% (94) women belonged to the age group (25-29). Participants who fall in age category (18-24) and age above 40 accounted for 12% (54) and 4% (18) respectively. In this study the mean age of the participants was 32.17 with SD value of 5.754.

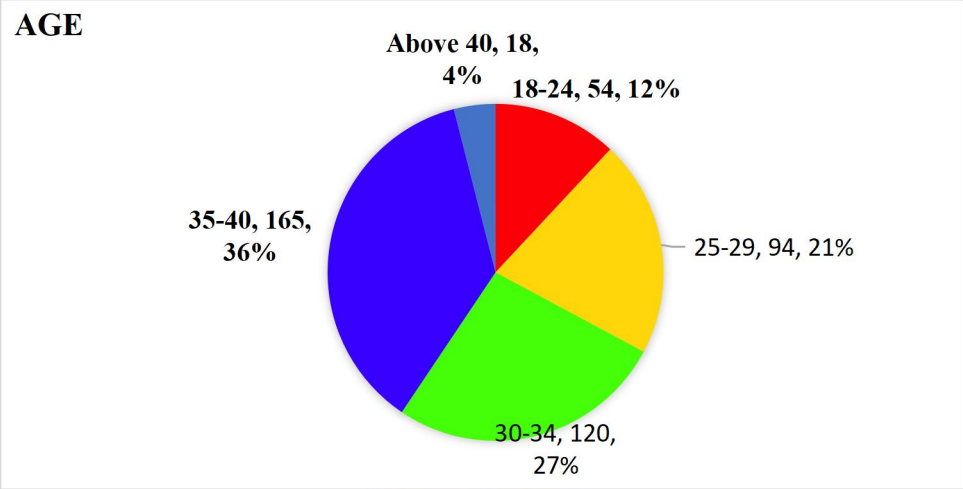

Figure 1. Respondents Age

Education Level

Education is always associated with awareness. Educated mother is more aware and know ledged about quality maternal care than illiterate or less educated women. In Australia, a study revealed that 91.7% of pregnant women used CAM products, with higher usage among those with university education and specific health concerns like fatigue (Jane Frawley et al., 2016).The decision-making of women regarding the use of (CAM) during antenatal care (ANC) is significantly influenced by various socio-demographic factors. These factors include education level, health literacy, income, and personal health experiences, which collectively shape women's perceptions and choices about CAM (Öztürk et al., 2022). Conversely another Study indicated that women with no schooling and those living far from basic health facilities are more likely to resort to traditional medicine (Shewamene, Dune, & Smith, 2020).

From the information presented in Figure 4.2, it can be observed that majority of respondents 57% were graduate and above, 24% obtained higher secondary school certificate, 10% attended elementary school and 9% of respondents obtained qualification up to middle, with mean value 12.88 and standard deviation 1.82.

Frontier in Medical & Health Research

ISSN: (e) 3007-1607 (p) 3007-1593

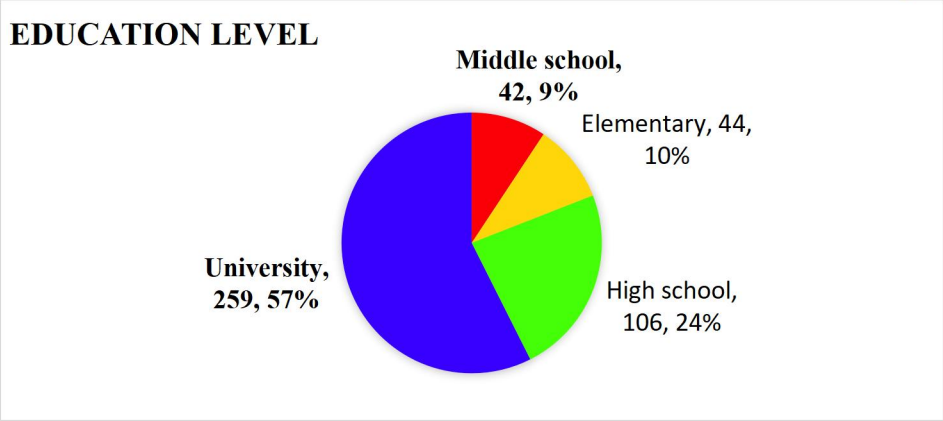

Figure 2 Respondents Education Level

Marital Status

According to Ozturk et al Factors such as education level, marital status, and health insurance significantly affect CAM usage (Öztürk et al., 2022). Married women may have better access to healthcare resources and support systems, influencing their CAM preferences (Küçükkaya & Işık, 2023).

From figure 4.3 it can be concluded that majority of women respondents were married 94%, while 9.2% of respondents were divorced or separated and 4% of respondents were widow with mean and SD value of 1.18 , 0.63 respectively.

One way ANOVA test

Education and CAM modalities utilization (Mind-body, Alternative medical system and Massage) during pregnancy

H_0 (Null Hypothesis)

There is no significant difference in mean of CAM modalities utilization (Mind-body, Alternative medical system and Massage) during antenatal care among the different educational level categories ($\mu_1 = \mu_2 = \mu_3$).

H_1 (Alternative Hypothesis)

There is a significant difference in mean of CAM modalities utilization (Mind-body, Alternative medical system and Massage) during antenatal care among the different educational level categories ($\mu_1 = \mu_2 = \mu_3$). At least one category mean is significantly different.

Table 1. Level of education and CAM modalities utilization (Mind-body, Alternative medical system and Massage) during antenatal care among women

SUMMARY

Groups	*Count*	*Sum*	*Average*	*Variance*
Column 1	44	361	8.204545	1.468816
Column 2	42	380	9.047619	2.729384
Column 3	106	934	8.811321	2.345013
Column 4	259	2173	8.389961	2.66517

ANOVA

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	29.37965	3	9.793215	3.947652	0.008478	2.624858
Within Groups	1108.904	447	2.48077			

Frontier in Medical & Health Research
ISSN: (e) 3007-1607 (p) 3007-1593

Total	1138.284	450

Since F (3.947652) > F crit (2.624858) and P-value (0.008478) < 0.05, which can be observed in table 1. This indicates absence of significant distribution of means, which in turn brings discrepancies towards the validity of the study and highlights the need to explore the other underlying factors, for this reason and inorder to deeply analyze the independent factors, factorial ANOVA test was applied and results are discussed in 4.4.1 table. The data given above suggests the rejection of the null hypothesis at the 5% significance. So, the null hypothesis is rejected and conclude that There is a significant difference in mean of CAM modalities utilization (Mind-body, Alternative medical system and Massage) during antenatal care among different educational level categories ($\mu_1 = \mu_2 = \mu_3$). At least one category mean is significantly different.

The relationship between education and the use of complementary and alternative medicine (CAM) during pregnancy is nuanced. While some studies suggest that education does not significantly influence CAM utilization, others indicate that higher educational attainment may be associated with increased CAM use. This discrepancy highlights the complexity of factors influencing CAM use among pregnant women.

Studies indicate that women with higher education levels are more inclined to use CAM. For instance, in a study conducted in Italy, 24.3% of pregnant women reported using CAM, with a significant association found between higher education and CAM usage (Viviana Stampini et al., 2024a). Another study by Frawley in (2015) concluded that a higher level of education is significantly associated with CAM utilization during pregnancy. The study found that women with university education were more likely to use CAM products and services, reflecting trends observed in general CAM user characteristics (J. E. Frawley, 2015).

Other research indicates that education level does not significantly correlate with CAM use. For instance, one study found no association between education and the likelihood of using CAM during pregnancy, suggesting that other factors, such as personal beliefs or health conditions, may be more influential (Skouteris et al., 2008)>

Monthly income and Women's attitude towards CAM based therapies usage during pregnancy

H_0 (Null Hypothesis)

There is no significant difference in mean value of women's attitude towards CAM based therapies usage during pregnancy across the different income groups ($\mu_1 = \mu_2 = \mu_3 = \mu_4$).

H_1 (Alternative Hypothesis)

There is a significant difference in mean value of women's attitude towards CAM based therapies usage during pregnancy across the different income groups. At least one income category mean is significantly different.

Table 2. Monthly income and Women's attitude towards CAM based therapies usage during pregnancy

SUMMARY

Groups	*Count*	*Sum*	*Average*	*Variance*
Column 1	238	1668	7.008403	2.85225
Column 2	119	838	7.042017	3.904999
Column 3	62	409	6.596774	3.457694

Frontier in Medical & Health Research

ISSN: (e) 3007-1607 (p) 3007-1593

Column 4	32	202	6.3125	3.447581		
ANOVA						
Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	21.88486	3	7.294955	2.241797	0.082727	2.624858
Within Groups	1454.567	447	3.254066			
Total	1476.452	450				

From the table above 2.the p-value (0.082727) is greater than 0.05 and F(2.241797)< F crit (2.624858) so, we accept the null hypothesis at the 5% significance level and conclude that There is no statistically significant difference in mean value of women's attitude towards CAM based therapies usage during pregnancy across the different income categories ($\mu_1 = \mu_2 = \mu_3 = \mu_4$).This significant homogeneity, supports the validity of the study and assures that any future observations can be reported confidently

A research indicated that socio-demographic factors, including income, do influence women's use of CAM during pregnancy. However, the specific impact of monthly income on attitudes towards CAM therapies was not explicitly detailed in the findings (J. E. Frawley, 2015). Another study by Jane Frawley in (2016), mentioned that monthly income was included as a confounder in the logistic regression model, but the study does not specify its significant influence on women's attitudes towards CAM use during pregnancy. Further research is needed to clarify this relationship (Jane Frawley et al., 2016).

Occupation and biologically based therapies, Pre/ Pro biotics and Omega 3 utilization during pregnancy among women

H_0 (Null Hypothesis)

There is no significant difference in mean of biologically based therapies, Pre/ Pro biotics and Omega 3 utilization during pregnancy among the different occupational categories ($\mu_1 = \mu_2 = \mu_3$).

H_1 (Alternative Hypothesis)

There is a significant difference in mean of biologically based therapies, Pre/ Pro biotics and Omega 3 utilization during pregnancy among the different occupational categories ($\mu_1 = \mu_2 = \mu_3$). At least one category mean is significantly different.

Table 3. Occupation and biologically based therapies, Pre/ Pro biotics and Omega 3 utilization during pregnancy among women

SUMMARY						
Groups	*Count*	*Sum*	*Average*	*Variance*		
Govt	81	851	10.50617	16.85309		
Housewife	293	3259	11.12287	16.18348		
Private	77	758	9.844156	18.10697		
ANOVA						
Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	107.869	2	53.93452	3.243331	0.039952	3.015854
Within Groups	7449.954	448	16.62936			

Frontier in Medical & Health Research

ISSN: (e) 3007-1607 (p) 3007-1593

Total	7557.823	450

As it can be observed from the table 3. above that the value of F-statistic = 3.243331, F-critical = 3.015854 and P-value = 0.039952, Since F (3.243331) > F crit (3.015854), This indicates absence of significant distribution of means, which in turn brings discrepancies towards the validity of the study and highlights the need to explore the other underlying factors. Based on the data given above, we reject the null hypothesis at the 5% significance level and conclude that, there is a statistically significant difference the in mean of biologically based therapies, Pre/ Pro biotics and Omega 3 utilization during pregnancy among the different occupational categories such as: (Government-employed, Housewife, Private-employed). At least one category mean is significantly different.

The association between occupation and the utilization of biologically based therapies, such as probiotics and omega-3, during pregnancy is influenced by various factors, including health awareness, access to healthcare, and socioeconomic status. Pregnant women in certain occupations may have more knowledge or resources to access these supplements, which are known to offer several health benefits during pregnancy. Omega-3 fatty acids, for instance, are crucial for fetal brain development and can help prevent maternal depression (Gallagher, 2004). In Iran, pregnant women of lower socioeconomic status reported higher CAM usage, suggesting that occupation may correlate with access and belief in CAM efficacy (Vardanjani et al., 2023).

Factorial ANOVA analysis:

Education, Occupation and CAM modalities utilization (Mind-body, Alternative medical system and Massage) during pregnancy

H_0 (Null Hypothesis)

There is no significant effect of education, occupation on CAM modalities utilization (Mind-body, Alternative medical system and Massage) during pregnancy

H_1 (Alternative Hypothesis)

There is a significant effect of education, occupation on CAM modalities utilization (Mind-body, Alternative medical system and Massage) during pregnancy

Table 4. Education, Occupation and CAM modalities utilization (Mind-body, Alternative medical system and Massage) during pregnancy

Tests of Between-Subjects Effects

Dependent Variable: CAM Usage

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	1.249[a]	11	.114	1.642	.084
Intercept	159.226	1	159.226	2301.648	.000
Education	.615	3	.205	2.964	.032
Occupation	.132	2	.066	.957	.385
Education * Occupation	.269	6	.045	.648	.692
Error	30.370	439	.069		
Total	943.611	451			

Frontier in Medical & Health Research

ISSN: (e) 3007-1607 (p) 3007-1593

Corrected Total	31.619	450

a. R Squared = .040 (Adjusted R Squared = .015)

The present study examined the effects of education level, occupation type, and their interaction on CAM usage. A factorial ANOVA was conducted to determine whether these categorical factors significantly influence the dependent variable.

The results in table 4. Revealed a significant main effect of education on CAM usage, $F(3, 439) = 6.642$, $p < .001$. This indicates that individuals with different levels of education use CAN differently. This finding is consistent with existing literature suggesting that higher education levels may increase awareness, access, or motivation toward technology-related or knowledge-based services.

Similarly, a significant main effect of occupation was found, $F(2, 439) = 3.926$, $p = .021$, suggesting that occupation also plays a role in CAM usage. Certain occupations may encourage or necessitate more frequent use of CAM related resources, leading to observable differences across occupational groups.

Importantly, the analysis revealed a significant interaction between education and occupation, $F(6, 439) = 2.385$, $p = .030$. This interaction implies that the effect of education on CAM usage is not consistent across all occupations. For instance, the influence of having a higher education level might be more pronounced in professional or private employment roles, while it might have a different or weaker effect among homemakers or other categories. This finding highlights the complexity of socio-demographic influences on behavior, suggesting that single-variable analyses may overlook important contextual factors.

A study reported that, higher education levels are associated with increased awareness and acceptance of CAM. In Australia, 52% of women with university education reported using CAM products during pregnancy (J. Frawley et al., 2013). In Kenya, the spouse's education level significantly impacted CAM usage, with informal education leading to higher rates (Makhapila, 2024)

Income, Occupation and herbs utilization (such garlic, turmeric and ginger) during pregnancy

H_0 (Null Hypothesis)

There is no significant effect of Income, Occupation and herbs utilization (such garlic, turmeric and ginger) during pregnancy

H_1 (Alternative Hypothesis)

There is a significant effect of Income, Occupation and herbs utilization (such garlic, turmeric and ginger) during pregnancy

Table 5 Income, Occupation and herbs utilization (such garlic, turmeric and ginger) during pregnancy

Tests of Between-Subjects Effects

Dependent Variable: herbs

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	570.717[a]	11	51.883	1.233	.262
Intercept	66852.399	1	66852.399	1588.654	.000
Occupation	348.640	2	174.320	4.142	.017
Income	154.028	3	51.343	1.220	.302
Occupation * Income	370.442	6	61.740	1.467	.188

Frontier in Medical & Health Research

ISSN: (e) 3007-1607 (p) 3007-1593

Error	18473.628	439	42.081
Total	191064.000	451	
Corrected Total	19044.346	450	

a. R Squared = .030 (Adjusted R Squared = .006)

For the dependent variable 'herbs', the factorial ANOVA with occupation and income as independent variables, according to the data given in table 5. Reveals a significant main effect of occupation ($F(2, 439) = 4.142$, $p = .017$). Income and the interaction term did not show significant effects ($p = .302$ and $p = .188$ respectively). The model's adjusted R-squared was .006, indicating a small effect size.

Occupation also significantly impacts herbal medicine utilization. In Ethiopia, housewives were found to have a higher likelihood of using herbal remedies, with an AOR of 11.816 (Gebrekidan & Kidanemariam, 2024).In Nigeria, the study highlighted that socio-demographic factors, including occupation, were critical in influencing the patterns of herbal medicine use during pregnancy (Duru et al., 2016).

In Ethiopia, a study found that a monthly family income of less than 2,800 ETB was a determinant factor for herbal medicine utilization, with an adjusted odds ratio of 1.72, indicating a higher likelihood of use among lower-income women (Wake & Fitie, 2022)

Chi-square Analysis

Education and CAM modalities utilization (Mind-body techniques such as prayer and yoga)

Hypothesis

H0: there is no significant association between Education and Mind/ body techniques utilization

H1: There is a significant association between Education and Mind/ body techniques utilization

Level of significance Alpha 5% (error)

Confidence Interval 95 %

Table 6 Level of education and CAM modalities utilization (Mind-body techniques such as prayer and yoga) during antenatal care among women

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	27.011a	6	.000
Likelihood Ratio	27.889	6	.000
N of Valid Cases	451		

a. 2 cells (16.7%) have expected count less than 5. The minimum expected count is 4.19.

Frontier in Medical & Health Research
ISSN: (e) 3007-1607 (p) 3007-1593

The observed P value from table 6 is 0.000 which is less than 0.05 and 16.7% of the cells have expected counts less than 5, with minimum expected count 4.19, which is greater than the critical threshold of 1.suggests that the assumptions of the Chi-Square test are met. So, we reject H0 and conclude that there is a significant association between Education and CAM modalities utilization (Mind-body techniques such as prayer and yoga) during antenatal care among women.

A study stated that, In Islamic contexts, gentle yoga combined with spiritual practices fosters a deeper connection to faith, enhancing emotional resilience and gratitude during pregnancy. Education that includes spiritual dimensions encourages pregnant women to engage in prayer, which can enhance emotional stability and provide comfort during pregnancy (Machmudah, Rahmat, Kosasih, Azka, & Hamrain, 2024). Another study reported that, Educational initiatives highlight the advantages of prenatal yoga, such as reduced anxiety, improved physical health, and better fetal positioning (Arlym, Nursasmita, & Lomrah, 2024).

Education and Attitudes of women towards CAM usage in pregnancy (with parameters such as: personal experience of effectiveness and evidence of effectiveness)

Hypothesis

H0: there is no significant association between Education and Attitudes of women towards CAM usage in pregnancy

H1: There is a significant association between Education and Attitudes of women towards CAM usage in pregnancy

Level of significance Alpha 5% (error)

Confidence Interval 95 %

Table 7 Level of education and Attitudes of women towards CAM usage in pregnancy

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	31.900a	12	.001
Likelihood Ratio	34.321	12	.001
N of Valid Cases	451		

a. 4 cells (20.0%) have expected count less than 5. The minimum expected count is 2.51.

In table 7.The observed P value is 0.001 which is less than 0.05. 20% of the cells have expected counts less than 5, which suggests that the assumptions of the Chi-Square test are marginally met. So, we reject H0 and conclude that there is a significant association between Education and Attitudes of women towards CAM usage in pregnancy (with parameters such as: personal experience of effectiveness and evidence of effectiveness).

According to Frawley, Educated women often seek evidence of clinical efficacy, indicating

Frontier in Medical & Health Research

ISSN: (e) 3007-1607 (p) 3007-1593

a preference for informed choices over anecdotal experiences (Jane Frawley et al., 2016). In another research also he stated that, nearly half of the women (48%) reported that their personal experiences with CAM influenced their decisions to use these products during pregnancy(J. E. Frawley, 2015). While many women express a desire for clinical evidence, personal experiences often take precedence in their decision-making process (Vardanjani et al., 2023).

Level of Income and Alternative medical system usage (Acupuncture, Ayurveda and detox) during antenatal care

Hypothesis

H0: there is no significant association between Level of Income and Alternative medical system usage (Acupuncture, Ayurveda and detox) during antenatal care

H1: There is a significant association between Level of Income and Alternative medical system usage (Acupuncture, Ayurveda and detox) during antenatal care

Level of significance Alpha 5% (error)

Confidence Interval 95 %

Table 8 Level of Income and Alternative medical system usage (Acupuncture, Ayurveda and detox) during antenatal care

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	7.869a	9	.547
Likelihood Ratio	7.434	9	.592
N of Valid Cases	451		

a. 2 cells (12.5%) have expected count less than 5. The minimum expected count is 3.48.

As observed in table 8 value of P is 0.547 which is more than 0.05 and 12.5% of the cells have expected counts less than 5, with minimum expected count 3.48 which is above the critical threshold of 1.suggests that the assumptions of the Chi-Square test are met. So, we conclude that H0 is not rejected and there is no significant association between Level of Income and Alternative medical system usage (Acupuncture, Ayurveda and detox) during antenatal care. A recent study concluded that many women reported using CAM due to perceived safety and efficacy, rather than financial considerations. The motivation for CAM use often stemmed from recommendations by friends or family, indicating social influences over economic factors (Prasad et al., 2024). In another survey, 37% of pregnant women reported using CAM, with no significant income-related disparities noted (Birdee et al., 2014).

Level of Income and Attitudes of women towards CAM usage in pregnancy (with parameters such as: personal experience of effectiveness and evidence of effectiveness)

Hypothesis

H0: there is no significant association between Level of Income and Attitudes of women towards CAM usage in pregnancy

Frontier in Medical & Health Research
ISSN: (e) 3007-1607 (p) 3007-1593

H1: There is a significant association between Level of Income and Attitudes of women towards CAM usage in pregnancy

Level of significance Alpha 5% (error)
Confidence Interval 95 %

Table 9 Level of Income and Attitudes of women towards CAM usage in pregnancy

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	24.854a	12	.016
Likelihood Ratio	25.198	12	.014
N of Valid Cases	451		

a. 3 cells (15.0%) have expected count less than 5. The minimum expected count is 1.92.

The data in table 9 Observed and P value is 0.016 which is less than 0.05, and 15.0% of the cells have expected counts less than 5, with minimum expected count 1.92, which is greater than the critical threshold of 1.suggests that the assumptions of the Chi-Square test are met. so, we reject H0 and conclude that there is a significant association between Level of Income and Attitudes of women towards CAM usage in pregnancy (with parameters such as: personal experience of effectiveness and evidence of effectiveness). Women with higher income levels often have greater access to information and resources, leading to a more informed choice regarding CAM. They are likely to consult CAM practitioners and report positive personal experiences with CAM products (J. E. Frawley, 2015).

Conversely, women from lower socioeconomic backgrounds tend to use CAM more frequently, often driven by a strong belief in its efficacy rather than clinical evidence (Vardanjani et al., 2023). This demographic may rely on personal experiences and anecdotal evidence from peers, which can shape their attitudes towards CAM (Jane Frawley et al., 2016)

Occupation of pregnant women and CAM therapy utilization (such a s: Mind-body medicine usage (prayer and yoga), Alternative medical system usage (acupuncture, Ayurveda, detox) and massage)

Hypothesis

H0: there is no significant association between Occupation of pregnant women and CAM therapy utilization

H1: There is a significant association between Occupation of pregnant women and CAM therapy utilization

Level of significance Alpha 5% (error)
Confidence Interval 95 %

Frontier in Medical & Health Research
ISSN: (e) 3007-1607 (p) 3007-1593

Table 10 Occupation of pregnant women and CAM therapy utilization

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	32.069a	12	.001
Likelihood Ratio	30.604	12	.002
N of Valid Cases	451		

a. 2 cells (9.5%) have expected count less than 5. The minimum expected count is 4.61.

In table 10 The observed P value is 0.001 which is less than 0.05, and 9.5% of the cells have expected counts less than 5, with minimum expected count 4.61, which is greater than the critical threshold of 1.suggests that the assumptions of the Chi-Square test are met. So, we reject H0 and conclude that there is a significant association between Occupation of pregnant women and CAM therapy utilization (such as: Mind-body medicine usage (prayer and yoga), Alternative medical system usage (acupuncture, Ayurveda, detox) and massage).

Mind-body practices are easy to implement, low-cost, and safe, making them suitable for working women who may have limited time and resources (Oyarzabal, Seuferling, Babbar, Lawton-O'Boyle, & Babbar, 2021). Women working full-time are more likely to continue using CAM therapies like massage during pregnancy, as indicated by a study showing that higher income and full-time employment correlate with ongoing CAM use (Jane Frawley et al., 2016). In Ethiopia, a high prevalence of spiritual healing and herbal supplements was reported, with occupation influencing the choice of these modalities (Emiru et al., 2021).

CONCLUSION

Antenatal care (ANC) is vital in reducing pregnancy-related complications and maternal and neonatal mortality. In Lahore, Pakistan, around 60% of pregnant women used Complementary and Alternative Medicine (CAM), particularly mind-body practices like prayer, Quran recitation, and fasting (87%), while fewer used yoga and meditation (32%). Herbal medicine and massage therapy were also common (65% and 50% respectively).

CAM use is influenced by self-learning (57%), family (20%), and healthcare providers (13%). However, communication gaps exist between women and healthcare providers, as 29% of women used CAM without informing their doctors. This non-disclosure is often because providers don't ask about CAM usage, indicating a need for greater awareness among medical professionals.

Statistical analysis revealed that education and occupation significantly affect CAM usage and attitudes, while income has less direct impact. Higher education and certain occupations are associated with more informed and positive attitudes toward CAM. Women's decisions are shaped by personal experiences, social influence,

Frontier in Medical & Health Research

ISSN: (e) 3007-1607 (p) 3007-1593

and perceived safety rather than financial constraints.

Overall, CAM is commonly used as a complementary—not alternative—approach alongside conventional care, with many women supporting its integration into formal maternal healthcare systems.

Suggestions & Recommendations

For Stakeholders:

- CAM integration in maternity care must align with cultural values and regulatory frameworks to ensure safe and accepted practices.
- Prioritize healthcare access for minorities.
- Launch government-supported CAM awareness campaigns and provide counseling on combining CAM with conventional medicine.
- Use mass media to spread CAM knowledge.
- Encourage collaboration between conventional and CAM practitioners for comprehensive and affordable maternal healthcare.

For Healthcare Providers:

- Promote open discussions about CAM use to balance cultural beliefs with medical safety.
- Warn against potential risks of herbal medicines, including toxicity and interactions with prescribed drugs.
- Recognize that the herbal medicine market is poorly regulated, raising contamination risks.
- Encourage women to consult professionals before using CAM therapies.

For Society:

- Acknowledge the role of historical and evolving cultural contexts in shaping CAM use during pregnancy.
- Understand that CAM is widely used due to cultural beliefs, peer influence, and perceived safety.

For Women:

- Improve awareness of balanced nutrition over sole reliance on supplements.
- Encourage informed decision-making that considers both personal experience and scientific evidence.

Focus on enhancing women's education to improve health choices, financial status, and overall care quality.

For Researchers:

Study the safety and efficacy of frequently used herbs during pregnancy.

Explore interactions between CAM and conventional medicine.

Conduct broader research on CAM usage patterns during pregnancy, delivery, and postpartum stages

Bibliography

Abdollahi, F., & Khani, S. (2016). Knowledge and practices on complementary and alternative medicine in a group of Iranian pregnant women. *Journal of Islamic and Iranian Traditional Medicine, 7*(2), 127-137.

ADAMOLEKUN, M. M., AKPOR, O. A., AKPOR, O. B., ADEOLA, O. E., & ADEWALE, O. B. (2023). Accessible and low-to zero-cost remedy: Traditional medicine use during pregnancy and labor. *Journal of Integrative Nursing, 5*(2), 75-80.

Adanikin, A. I., & Awoleke, J. O. (2016). Sociodemographic factors associated with anaemia in pregnancy at booking for antenatal care. *J Obstet Gynaecol, 36*(1), 44-47. doi: 10.3109/01443615.2015.1025727

Ahmad, M., Khan, M. P. Z., Mukhtar, A., Zafar, M., Sultana, S., & Jahan, S. (2016). Ethnopharmacological survey on medicinal plants used in herbal drinks among the traditional communities of Pakistan. *Journal of Ethnopharmacology, 184*, 154-186.

Ahmad, M., Zafar, M., Shahzadi, N., Yaseen, G., Murphey, T. M., & Sultana, S. (2018). Ethnobotanical importance of medicinal plants traded in Herbal markets of Rawalpindi-Pakistan. *Journal of Herbal Medicine, 11*, 78-89.

Ahmed, M., Hwang, J. H., Choi, S., & Han, D. (2017). Safety classification of herbal medicines used among pregnant women in Asian countries:

Frontier in Medical & Health Research

ISSN: (e) 3007-1607 (p) 3007-1593

a systematic review. *BMC complementary and alternative medicine*, *17*, 1-11.

7) Ali, A. A., Rayis, D. A., Abdallah, T. M., Elbashir, M. I., & Adam, I. (2011). Severe anaemia is associated with a higher risk for preeclampsia and poor perinatal outcomes in Kassala hospital, eastern Sudan. *BMC Res Notes*, *4*, 311. doi: 10.1186/1756-0500-4-311
8) Ali, R., Ciccone, J., & Dalal, P. (2019). Complementary and Alternative Medicine. *Academic Pain Medicine: A Practical Guide to Rotations, Fellowship, and Beyond*, 163-166.
9) Arabiat, D., Whitehead, L., & Gaballah, S. (2022). The Use of Complementary Medicine During Childbearing Years: A Multi-Country Study of Women From the Middle East استفاده از طب مکمل در دوران بارورى: یک مطالعه چند کشورى درزنان خاور میانهاستخدام الطب التكميلي خلال سنوات الإنجاب: دراسة متعددة البلدان لنساء من الشرق الأوسط. *9*, 23333936211042616. doi: 10.1177/23333936211042616
10) Arlym, L. T., Nursasmita, R., & Lomrah, S. (2024). Edukasi Latihan Prenatal Yoga pada Ibu Hamil sebagai Upaya Mengurangi Kecemasan dan Optimalisasi Posisi Janin. *Jurnal Abdimas Kesehatan (JAK)*, *6*(2), 332-337.
11) Aswitami, N. G. A. P., Udayani, N. P. M. Y., Sulistianingsih, A., Fitria, F., Pramana, C., Mutia, C., & Supinganto, A. (2022). The effect of pregnancy massage on pregnant mother's anxiety before labor. *International Journal of Health Sciences*(I), 845-856.
12) Babbar, S., Williams, K. B., & Maulik, D. (2017). Complementary and alternative medicine use in modern obstetrics: a survey of the central association of obstetricians & gynecologists members. *Journal of evidence-based complementary & alternative medicine*, *22*(3), 429-435.
13) Bambague, G., Stiven Orozco, D., Alexander Mosquera, D., Giraldo-Jiménez, C. F., & Casanova Marcillo, K. (2024). PERCEPTION OF TRADITIONAL MEDICINE DURING PREGNANCY, CHILDBIRTH, AND POSTPARTUM IN THE TACUEYO INDIGENOUS RESERVATION, CAUCA, COLOMBIA. *Environmental & Social Management Journal/Revista de Gestão Social e Ambiental*, *18*(10).
14) Barnes, L. A. (2020). *Complementary medicine product use in pregnancy and lactation.* University of Sydney.
15) Bayisa, B., Tatiparthi, R., & Mulisa, E. (2014). Use of herbal medicine among pregnant women on antenatal care at Nekemte Hospital, Western Ethiopia. *Jundishapur journal of natural pharmaceutical products*, *9*(4).
16) Bekele, A., Tilahun, M., & Mekuria, A. (2016). Prevalence of anemia and its associated factors among pregnant women attending antenatal care in health institutions of Arba Minch town, Gamo Gofa Zone, Ethiopia: A cross-sectional study. *Anemia*, *2016*(1), 1073192.
17) Bhatia, R., Khosla, P., Mor, S., Vashishat, N., & Aggarwal, G. (2020). Complementary and Alternative Medicinal Use amongst Antenatal in a Rural Tertiary Care Hospital of Haryana. *Indian Journal of Public Health Research & Development*, *11*(7), 694-699.
18) Birdee, G. S., Kemper, K. J., Rothman, R., & Gardiner, P. (2014). Use of complementary and alternative medicine during pregnancy and the postpartum period: an analysis of the National Health Interview Survey. *Journal of women's health*, *23*(10), 824-829.
19) Bouqoufi, A., Lahlou, L., Ait El Hadj, F., Abdessadek, M., Obtel, M., & Khabbal, Y. (2023). Prevalence, motivation, and associated factors of medicinal herbs consumption in pregnant women from Eastern Mediterranean Regional Office: a systematic review. *Pharmaceutical Biology*, *61*(1), 1065-1081.
20) Brosnan, C., Dew, K., & Donovan, S. (2023). Encyclopedia of Health Research in the Social Sciences *Complementary and alternative medicine* (pp. 36-41): Edward Elgar Publishing.
21) Bruno, L. O., Simoes, R. S., de Jesus Simoes, M., Girão, M. J. B. C., & Grundmann, O. (2018).

Frontier in Medical & Health Research

ISSN: (e) 3007-1607 (p) 3007-1593

Pregnancy and herbal medicines: an unnecessary risk for women's health—a narrative review. *Phytotherapy research, 32*(5), 796-810.

22) Butt, S. u. R., Bull, J. M., & Boyce, A. (2017). Complementary and alternative medicine: conventional solution to an unconventional problem. *Internal Medicine Journal, 47*(5).

23) Candido, A. C. R., Ferraz, S. D., Uggioni, M. L. R., Zanevan, I. R., Colonetti, L., Grande, A. J., . . . Rosa, M. I. d. (2023). Omega-3 as an adjuvant in the treatment eating and psychological symptoms in patients with anorexia nervosa: a systematic review and meta-analyses. *Journal of Human Nutrition and Dietetics, 36*(5), 1970-1981.

24) Cawley, S., Mullaney, L., McKeating, A., Farren, M., McCartney, D., & Turner, M. J. (2016). An analysis of folic acid supplementation in women presenting for antenatal care. *Journal of Public Health, 38*(1), 122-129.

25) Cheng, H. C., De Costa, C., McLean, A., & Woods, C. (2014). Vitamin D concentrations in pregnant women with diabetes attending for antenatal care in Far N orth Q ueensland. *Australian and New Zealand Journal of Obstetrics and Gynaecology, 54*(3), 275-278.

26) Choi, S., & Wong, G. (2016). It's just a standard deviation! *Anaesthesia, 71*(8), 969-971.

27) Chouhan, P., & Garg, A. K. (2021). Agrochemical exposure and its adverse effects on pregnancy with the importance of preconceptional detoxification and management through ayurveda. *Journal of Ayurveda, 15*(4), 303-310.

28) De Wit, L., Jeurissen, S., & Chen, W. (2021). Risk assessment of herbal preparations containing St John's wort.

29) Desai, V., Kozyrskyj, A. L., Lau, S., Sanni, O., Dennett, L., Walter, J., & Ospina, M. B. (2021). Effectiveness of probiotic, prebiotic, and synbiotic supplementation to improve perinatal mental health in mothers: a systematic review and meta-analysis. *Frontiers in psychiatry, 12*, 622181.

)) Deus, C. d. (2024). *Probióticos e betalaínas: avanços em co-encapsulação e aplicação em bebida funcional.* Universidade Federal de Santa Maria.

.) Dugard, P., Todman, J., & Staines, H. (2022). Analysis of variance (ANOVA) *Approaching Multivariate Analysis, 2nd Edition* (pp. 13-54): Routledge.

!) Duncan, L. G., Cohn, M. A., Chao, M. T., Cook, J. G., Riccobono, J., & Bardacke, N. (2017). Benefits of preparing for childbirth with mindfulness training: a randomized controlled trial with active comparison. *BMC pregnancy and childbirth, 17*, 1-11.

3) Duru, C. B., Uwakwe, K. A., Chinomnso, N. C., Mbachi, I. I., Diwe, K. C., Agunwa, C. C., . . . Merenu, I. A. (2016). Socio-demographic determinants of herbal medicine use in pregnancy among Nigerian women attending clinics in a tertiary Hospital in Imo State, south-east, Nigeria. *Am J Med Stud, 4*(1), 1-10.

4) Ee, C., Levett, K., Smith, C., Armour, M., Dahlen, H. G., Chopra, P., . . . Grant, S. (2022). Complementary medicines and therapies in clinical guidelines on pregnancy care: A systematic review. *Women and Birth, 35*(4), e303-e317.

5) Emiru, Y. K., Adamu, B. A., Erara, M., Chanie, T., & Gurmu, A. E. (2021). Complementary and alternative medicine use in a pregnant population, Northwest Ethiopia. *International Journal of Reproductive Medicine, 2021*(1), 8829313.

6) Falzon, C. C., & Balabanova, A. (2017). Phytotherapy: an introduction to herbal medicine. *Primary Care: Clinics in Office Practice, 44*(2), 217-227.

7) Feijen-de Jong, E. I., Jansen, D. E., Baarveld, F., Spelten, E., Schellevis, F., & Reijneveld, S. A. (2015). Determinants of use of care provided by complementary and alternative health care practitioners to pregnant women in primary midwifery care: a prospective cohort study. *BMC pregnancy and childbirth, 15*, 1-11.

8) Fjær, E. L., Landet, E. R., McNamara, C. L., & Eikemo, T. A. (2020). The use of complementary

Frontier in Medical & Health Research

ISSN: (e) 3007-1607 (p) 3007-1593

and alternative medicine (CAM) in Europe. *BMC complementary medicine and therapies, 20*, 1-9.

39) Fleet, J.-A., Adelson, M. P., Mckellar, L., & Steen, M. (2023). Antenatal education incorporating complementary medicine techniques to reduce birth interventions: A randomised control trial. *Women and Birth, 36*, S16.

40) Forsby, M., Winkvist, A., Bärebring, L., & Augustin, H. (2024). Supplement use in relation to dietary intake in pregnancy: an analysis of the Swedish GraviD cohort. *British Journal of Nutrition, 131*(2), 256-264.

41) Frawley, J., Adams, J., Sibbritt, D., Steel, A., Broom, A., & Gallois, C. (2013). Prevalence and determinants of complementary and alternative medicine use during pregnancy: results from a nationally representative sample of Australian pregnant women. *Australian and New Zealand Journal of Obstetrics and Gynaecology, 53*(4), 347-352.

42) Frawley, J., Sibbritt, D., Broom, A., Gallois, C., Steel, A., & Adams, J. (2016). Complementary and alternative medicine practitioner use prior to pregnancy predicts use during pregnancy. *Women & health, 56*(8), 926-939.

43) Frawley, J., Sibbritt, D., Broom, A., Gallois, C., Steel, A., & Adams, J. (2016). Women's attitudes towards the use of complementary and alternative medicine products during pregnancy. *Journal of obstetrics and gynaecology, 36*(4), 462-467.

44) Frawley, J. E. (2015). *Women's use of complementary and alternative medicine products and services during pregnancy: insights for safe, informed maternity care.*

45) Frawley, J. E., McIntyre, E., Sibbritt, D., Wardle, J., Schloss, J., Lauche, R., & Adams, J. (2018). Associations between cancer screening behavior and complementary medicine use: results of a national cross-sectional survey of 9151 Australian women. *Integrative cancer therapies, 17*(3), 979-985.

46) Gallagher, S. (2004). Omega 3 oils and pregnancy. *Midwifery today with international midwife*(69), 26-31.

47) Gantner, G., Spiess, D., Randecker, E., Quack Lötscher, K. C., & Simões-Wüst, A. P. (2021). Use of herbal medicines for the treatment of mild mental disorders and/or symptoms during pregnancy: a cross-sectional survey. *Frontiers in pharmacology, 12*, 729724.

3) Gasq, E. (2014). *Comment améliorer les apports en oméga-3? Des recommandations de l'Anses à des conseils pratiques utiles au généraliste.* Université Toulouse III-Paul Sabatier.

)) Gebrekidan, H., & Kidanemariam, G. (2024). Magnitude and Associated Factors of Herbal Medicine Use During Pregnancy Among Women Attending Antenatal Care in Public Health Institutions of Central Tigray, Northern Ethiopia (2020): Facility-Based Cross-Sectional Study. *Journal of Pregnancy, 2024*(1), 9932851.

)) Grenier, L., Suhowatsky, S., Kabue, M. M., Noguchi, L. M., Mohan, D., Karnad, S. R., . . . Wambua, J. (2019). Impact of group antenatal care (G-ANC) versus individual antenatal care (ANC) on quality of care, ANC attendance and facility-based delivery: a pragmatic cluster-randomized controlled trial in Kenya and Nigeria. *PLoS One, 14*(10), e0222177.

.) Guo, J., Zheng, A., He, J., Ai, M., Gan, Y., Zhang, Q., . . . Kuang, L. (2021). The prevalence of and factors associated with antenatal depression among all pregnant women first attending antenatal care: a cross-sectional study in a comprehensive teaching hospital. *BMC pregnancy and childbirth, 21*(1), 713. doi: 10.1186/s12884-021-04090-z

:) Holden, S. C., Gardiner, P., Birdee, G., Davis, R. B., & Yeh, G. Y. (2015). Complementary and alternative medicine use among women during pregnancy and childbearing years. *Birth, 42*(3), 261-269.

3) Hurst, A., & Abayomi, J. (2018). Dietary supplements in pregnancy. *Agro Food Industry Hi-Tech, 29*, 46-49.

4) Illamola, S. M., Amaeze, O. U., Krepkova, L. V., Birnbaum, A. K., Karanam, A., Job, K. M., . . . Enioutina, E. Y. (2019). Use of Herbal Medicine by Pregnant Women: What Physicians Need to

Frontier in Medical & Health Research

ISSN: (e) 3007-1607 (p) 3007-1593

Know. *Front Pharmacol, 10*, 1483. doi: 10.3389/fphar.2019.01483

55) Illangasinghe, P., & Jayaratne, K. (2023). Utilization of antenatal care services and pregnancy outcomes of women in advanced maternal age in Sri Lanka. *Population Medicine, 5*(Supplement).

56) Irawati, K., Indarwati, F., Haris, F., Lu, J.-Y., & Shih, Y.-H. (2023). Religious practices and spiritual well-being of schizophrenia: Muslim perspective. *Psychology Research and Behavior Management*, 739-748.

57) Jann, B. (2021). FRE: Stata module to display one-way frequency table.

58) Jawed, K., Nisar, N., Hussain, M., & Nawab, F. (2019). A study based on use of Complementary and Alternative Medicine among Diabetic Patients in Karachi, Pakistan. *Journal of the Dow University of Health Sciences (JDUHS), 13*(1), 10-16.

59) Jin, B., Han, Y., Jiang, Y., Zhang, J., Shen, W., & Zhang, Y. (2024). Acupuncture for nausea and vomiting during pregnancy: A systematic review and meta-analysis. *Complementary therapies in medicine*, 103079.

60) John, L. J., & Shantakumari, N. (2015). Herbal medicines use during pregnancy: a review from the Middle East. *Oman medical journal, 30*(4), 229.

61) Judge, M. P. (2018). Omega-3 consumption during pregnancy to support optimal outcomes. *Journal of Obstetric, Gynecologic & Neonatal Nursing, 47*(3), 429-437.

62) Kabongo, W. N. S. (2015). *The determinants of access to health care services: empirical evidence from African countries.*

63) Kennedy, D. A., Lupattelli, A., Koren, G., & Nordeng, H. (2013). Herbal medicine use in pregnancy: results of a multinational study. *BMC Complement Altern Med, 13*, 355. doi: 10.1186/1472-6882-13-355

64) Khan, T. Y., Badshah, L., & Ali, A. (2018). Ethnobotanical survey of some important medicinal plants of area Mandan district Bannu, Khyber Pakhtunkhwa, Pakistan. *Int. J. Herb. Med, 6*, 15-21.

65) Küçükkaya, B., & Işık, H. K. (2023). Attitudes pregnant women in Türkiye towards holistic complementary and alternative medicine and influencing factors: a web-based cross-sectional study. *BMC complementary medicine and therapies, 23*(1), 223.

66) Kuder, L., Dinevski, D., Dinevski, I. V., Takač, I., Mujezinović, F., & Elveđi Gašparović, V. (2024). Benefits of yoga in pregnancy: a randomised controlled clinical trial. *Journal of Perinatal Medicine*(0).

67) Kumar, A. (2014). Complementary and alternative medicine is mother medicine. *Alternative & Integrative Medicine*.

68) Li, G., & Zhou, X. (2011). Improvement in Statistic Method to Chinese Character Frequency Study. *Journal of Beijing Normal University (Social Sciences), 6*, 45-50.

69) Machmudah, A., Rahmat, M., Kosasih, A., Azka, I., & Hamrain, F. B. (2024). SPIRITUAL ENHANCEMENT THROUGH PRENATAL GENTLE YOGA WITHIN ISLAMIC CULTURAL CONTEXTS. *Al-Qalam, 30*(2), 370-382.

70) Makhapila, M. N. (2024). *Complementary and Alternative Medicine Utilization among Pregnant Women Attending Antenatal Care Clinics in Tongaren Sub-County, Bungoma County.* JKUAT-COHES.

71) McGowan, S. (2022). The effects of pregnancy massage on mother and baby. *Journal of Health Visiting, 10*(11), 464-467.

72) Mehboob, R. (2023). The use of complementary and alternative medicine in health care. *Pakistan Journal of Health Sciences*, 01-01.

73) Mehta, S., Grover, A., Kale, E., Nanda, P., & Mehta, A. (2023). Meditation and yoga in pregnancy: Maternal and fetal impact. *International Journal of Reproduction, Contraception, Obstetrics and Gynecology, 12*(2), 413-419.

74) Mitchell, M., & McClean, S. (2014). Pregnancy, risk perception and use of complementary and

Frontier in Medical & Health Research

ISSN: (e) 3007-1607 (p) 3007-1593

alternative medicine. *Health, risk & society, 16*(1), 101-116.

75) Mozes, K., Elgina, S., Mozes, V., Rudaeva, E., Shibelgut, N., Chaplygina, O., & Pomytkina, T. (2024). Nutritional support during pregnancy. *Obstetrics, Gynecology and Reproduction, 17*(6), 769-782.

76) Mubeen, S. M., Mansoor, S., Hussain, A., & Qadir, S. (2012). Perceptions and practices of fasting in Ramadan during pregnancy in Pakistan. *Iranian Journal of Nursing and Midwifery Research, 17*(7), 467-471.

77) Mudonhi, N., & Nunu, W. N. (2022). Traditional medicine utilisation among pregnant women in sub-saharan african countries: a systematic review of literature. *INQUIRY: The Journal of Health Care Organization, Provision, and Financing, 59*, 00469580221088618.

78) Mudonhi, N., Nunu, W. N., Sibanda, N., & Khumalo, N. (2021). Exploring traditional medicine utilisation during antenatal care among women in Bulilima District of Plumtree in Zimbabwe. *Scientific Reports, 11*(1), 6822.

79) Mueller, S. M., & Grunwald, M. (2021). Effects, side effects and contraindications of relaxation massage during pregnancy: a systematic review of randomized controlled trials. *Journal of clinical medicine, 10*(16), 3485.

80) Muhammad, H., Rahim, G., & Muhammad, R. (2023). THE EFFECT OF RAMADAN FASTING ON PREGNANCY OUTCOMES DURING THE SECOND AND THIRD TRIMESTER. *JOURNAL OF SULAIMANI MEDICAL COLLEGE, 13*(1), 13-21.

81) Murray, M. T. (2020). Glycyrrhiza glabra (licorice). *Textbook of natural medicine*, 641.

82) Musa, A. Z. (2017). Statistical issues II: chi-square test statistics. *Nigerian Journal of Clinical & Biomedical Research, 7*(9), 29-35.

83) Mussarat, S., Ali, R., Ali, S., Mothana, R. A., Ullah, R., & Adnan, M. (2021). Medicinal animals and plants as alternative and complementary medicine in southern regions of Khyber Pakhtunkhwa, Pakistan. *Frontiers in pharmacology, 12*, 649046.

84) Navarro, D., & Foxcroft, D. (2025). 14. Factorial ANOVA.

85) Ng, J. Y. (2021). Insight into the characteristics of research published in traditional, complementary, alternative, and integrative medicine journals: a bibliometric analysis. *BMC complementary medicine and therapies, 21*(1), 185.

86) Ng, J. Y., Liang, L., & Gagliardi, A. R. (2016). The quantity and quality of complementary and alternative medicine clinical practice guidelines on herbal medicines, acupuncture and spinal manipulation: systematic review and assessment using AGREE II. *BMC complementary and alternative medicine, 16*, 1-10.

87) Ngetich, H. C. (2013). *Utilization of Herbal Medicine During Pregnancy, Labour and Post-partum Period Among Women at Embu Provincial General Hospital.* University of Nairobi.

88) Ong, S. C., Tan, Z. S. S., Ooi, G. S., Athirah Daud, N. A., & Mohammed, M. (2024). Assessment of Knowledge, Attitudes, and Practices Toward Traditional and Complementary Medicines among the General Public in Malaysia. *Malaysian Journal of Medicine & Health Sciences, 20*.

89) Onyiapat, J.-l., Okafor, C., Okoronkwo, I., Anarado, A., Chukwukelu, E., Nwaneri, A., & Okpala, P. (2017). Complementary and alternative medicine use: Results from a descriptive study of pregnant women in Udi local Government area of Enugu state, Nigeria. *BMC complementary and alternative medicine, 17*, 1-7.

90) Ota, E., Mori, R., Middleton, P., Tobe-Gai, R., Mahomed, K., Miyazaki, C., & Bhutta, Z. A. (2015). Zinc supplementation for improving pregnancy and infant outcome. *Cochrane Database of Systematic Reviews*(2).

91) Othman, A. R., Yin, T. S., Sulaiman, S., Ibrahim, M. I. M., & Razha-Rashid, M. (2011). Application of mean and standard deviation in questionnaire surveys. *Menemui Matematik (Discovering Mathematics), 33*(1), 11-22.

Frontier in Medical & Health Research

ISSN: (e) 3007-1607 (p) 3007-1593

92) Oyarzabal, E. A., Seuferling, B., Babbar, S., Lawton-O'Boyle, S., & Babbar, S. (2021). Mind-body techniques in pregnancy and postpartum. *Clinical Obstetrics and Gynecology, 64*(3), 683-703.

93) Öztürk, R., Emi nov, A., & Ertem, G. (2022). Use of complementary and alternative medicine in pregnancy and labour pain: a cross-sectional study from turkey. *BMC complementary medicine and therapies, 22*(1), 332.

94) Pallivalappila, A. R., Stewart, D., Shetty, A., Pande, B., Singh, R., & McLay, J. S. (2014). Complementary and alternative medicine use during early pregnancy. *Eur J Obstet Gynecol Reprod Biol, 181*, 251-255. doi: 10.1016/j.ejogrb.2014.08.017

95) Peprah, P., Agyemang-Duah, W., Arthur-Holmes, F., Budu, H. I., Abalo, E. M., Okwei, R., & Nyonyo, J. (2019). 'We are nothing without herbs': a story of herbal remedies use during pregnancy in rural Ghana. *BMC complementary and alternative medicine, 19*, 1-12.

96) Perichart-Perera, O., Rodríguez-Cano, A., & Gutierrez Castrellon, P. (2020). Importancia de la suplementación en el embarazo: papel de la suplementación con hierro, ácido fólico, calcio, vitamina D y multivitamínicos. *Gaceta medica de Mexico, 156*. doi: 10.24875/GMM.M20000434

97) Peterson, C. K., Mühlemann, D., & Humphreys, B. K. (2014). Outcomes of pregnant patients with low back pain undergoing chiropractic treatment: a prospective cohort study with short term, medium term and 1 year follow-up. *Chiropractic & Manual Therapies, 22*(1), 1-7.

98) Pisani-Conway, C. (2021). Ayurveda for Modern Obstetrics. *Clinical Obstetrics and Gynecology, 64*(3), 589-601.

99) Prasad, S., Agrawal, A., Kanwat, B., Agrawal, C., Sharma, A., & Bhandari, A. (2024). Complementary and Alternative Medicine use among pregnant women attending antenatal clinic: a point to ponder. *Journal of Perinatal Medicine, 52*(9), 970-976.

)0) Qureshi, N. A., Khalil, A. A., & Alsanad, S. M. (2020). Spiritual and religious healing practices: some reflections from Saudi National Center for Complementary and Alternative Medicine, Riyadh. *Journal of religion and health, 59*(2), 845-869.

)1) Quzmar, Y., Istiatieh, Z., Nabulsi, H., Zyoud, S. e. H., & Al-Jabi, S. W. (2021). The use of complementary and alternative medicine during pregnancy: a cross-sectional study from Palestine. *BMC complementary medicine and therapies, 21*, 1-10.

)2) Rådmark, L. (2021). *Mind and Body Exercises: Associations with Mental Health, Antidepressant Medication, Autonomic Functioning and Inflammatory Biomarkers*. Karolinska Institutet (Sweden).

)3) Romlah, S., Pramono, J. S., & Suryani, H. (2023). The Effect of Classic Music Therapy and Lavender Aromatherapy Candles on Anxiety Levels of Trimester III Pregnant Women. *Journal of Pharmaceutical and Health Research, 4*(3), 396-403.

)4) Ross, A., Willson, V. L., Ross, A., & Willson, V. L. (2017). One-way anova. *Basic and advanced statistical tests: Writing results sections and creating tables and figures*, 21-24.

)5) Sabia, M., Ganguly, K., & Gessman, R. Can diet alone control inflammation. *A comprehensive narrative review of dietary foods and supplements and their effects on inflammation and pain. J pub health catalog. 2018; 1 (3): 1-8. J pub health catalog 2018 Volume 1 Issue, 3*.

)6) Santos, G. S., Monteiro, H. M. C., & de Almeida, R. R. (2023). Efeitos da suplementação de ômega-3 na síndrome da anorexia-caquexia em pacientes oncológicos: uma revisão sistemática. *BRASPEN Journal, 36*(1), 115-122.

)7) Sarecka-Hujar, B., & Szulc-Musioł, B. (2022). Herbal Medicines-Are They Effective and Safe during Pregnancy? , *14*(1). doi: 10.3390/pharmaceutics14010171

Frontier in Medical & Health Research

ISSN: (e) 3007-1607 (p) 3007-1593

108) Sarecka-Hujar, B., & Szulc-Musioł, B. (2022). Herbal medicines—are they effective and safe during pregnancy? *Pharmaceutics, 14*(1), 171.

109) Schürger, N., Klein, E., Hapfelmeier, A., Kiechle, M., & Paepke, D. (2018). Demand for integrative medicine among women in pregnancy and childbed: a German survey on patients' needs. *BMC complementary and alternative medicine, 18*, 1-11.

110) Shewamene, Z., Dune, T., & Smith, C. A. (2020). Use of traditional and complementary medicine for maternal health and wellbeing by African migrant women in Australia: a mixed method study. *BMC complementary medicine and therapies, 20*, 1-12.

111) Sheyholislami, H., & Connor, K. L. (2021). Are probiotics and prebiotics safe for use during pregnancy and lactation? A systematic review and meta-analysis. *Nutrients, 13*(7), 2382.

112) Sheyholislami, H., & Connor, K. L. (2021). Are Probiotics and Prebiotics Safe for Use during Pregnancy and Lactation? A Systematic Review and Meta-Analysis. *Nutrients, 13*(7). doi: 10.3390/nu13072382

113) Siddique, Z., Shad, N., Shah, G. M., Naeem, A., Yali, L., Hasnain, M., . . . Khan, I. (2021). Exploration of ethnomedicinal plants and their practices in human and livestock healthcare in Haripur District, Khyber Pakhtunkhwa, Pakistan. *Journal of ethnobiology and ethnomedicine, 17*, 1-22.

114) Singer, J., & Adams, J. (2014). Integrating complementary and alternative medicine into mainstream healthcare services: the perspectives of health service managers. *BMC complementary and alternative medicine, 14*, 1-11.

115) Skouteris, H., Wertheim, E. H., Rallis, S., Paxton, S. J., Kelly, L., & Milgrom, J. (2008). Use of complementary and alternative medicines by a sample of Australian women during pregnancy. *Australian and New Zealand Journal of Obstetrics and Gynaecology, 48*(4), 384-390.

116) Stampini, V., & Aquino, C. I. (2024). The use of complementary and alternative medicine (CAM) during pregnancy. *21*(4), 548-553. doi: 10.1515/jcim-2024-0207

117) Stampini, V., Aquino, C. I., Airoldi, C., Parini, S., Surico, D., & Remorgida, V. (2024a). The use of complementary and alternative medicine (CAM) during pregnancy. *Journal of Complementary and Integrative Medicine*(0).

118) Stampini, V., Aquino, C. I., Airoldi, C., Parini, S., Surico, D., & Remorgida, V. (2024b). The use of complementary and alternative medicine (CAM) during pregnancy. *Journal of Complementary and Integrative Medicine, 21*(4), 548-553.

119) Steel, A., Adams, J., Sibbritt, D., Broom, A., Gallois, C., & Frawley, J. (2012). Utilisation of complementary and alternative medicine (CAM) practitioners within maternity care provision: results from a nationally representative cohort study of 1,835 pregnant women. *BMC pregnancy and childbirth, 12*(1), 146. doi: 10.1186/1471-2393-12-146

120) Strouss, L., Mackley, A., Guillen, U., Paul, D. A., & Locke, R. (2014). Complementary and Alternative Medicine use in women during pregnancy: do their healthcare providers know? *BMC complementary and alternative medicine, 14*, 1-9.

121) Tahir, A. H., Tanveer, M., Shahnaz, G., Saqlain, M., Ayub, S., & Ahmed, A. (2023). Knowledge, attitude, and perceptions of healthcare professionals towards complementary and alternative medicine: a cross-sectional survey from twin cities of Pakistan. *BMC complementary medicine and therapies, 23*(1), 432.

122) Tangkiatkumjai, M., Boardman, H., & Walker, D.-M. (2020). Potential factors that influence usage of complementary and alternative medicine worldwide: a systematic review. *BMC complementary medicine and therapies, 20*, 1-15.

123) Thaik, C., Moscucci, M., Warber, S. L., & Aaronson, K. D. (2020). Complementary and Alternative Medicine. *Practical Cardiology:*

Frontier in Medical & Health Research

ISSN: (e) 3007-1607 (p) 3007-1593

Evaluation and Treatment of Common Cardiovascular Disorders, 429-446.

124) Thipanyane, M. P., Nomatshila, S. C., Oladimeji, O., & Musarurwa, H. (2022). Perceptions of pregnant women on traditional health practices in a rural setting in South Africa. *International journal of environmental research and public health, 19*(7), 4189.

125) Vaamonde, D., Hernandez, P., Bonnifield, E., & Rosenthal, L. (2022). Chapter 21 - Traditional Chinese medicine and Ayurvedic care during pregnancy. In D. Vaamonde, A. C. Hackney & J. M. Garcia-Manso (Eds.), *Fertility, Pregnancy, and Wellness* (pp. 415-438): Elsevier.

126) Valarmathi, S., AS, M. H., & Sundar, J. S. (2024). Journal Homepage:-www. journalijar. com.

127) Vardanjani, H. M., Steel, A., Mofarrahi, D., Jaladat, A. M., Amini, F., Zeraatpishe, M., & Pasalar, M. (2023). Use of complementary and alternative medicine and its related factors among pregnant women in Shiraz, South of Iran: a cross-sectional study. *Iranian Journal of Nursing and Midwifery Research, 28*(1), 53-59.

128) Wake, G. E., & Fitie, G. W. (2022). Magnitude and determinant factors of herbal medicine utilization among mothers attending their antenatal care at public health institutions in Debre Berhan Town, Ethiopia. *Frontiers in Public Health, 10*, 883053.

129) Wal, A., Wal, P., Verma, N., Rai, A. K., & Vatsha, P. (2023). Mechanism, Pathophysiology and Herbal Management-A Review on Irritable Bowel Syndrome. *The Natural Products Journal, 13*(3), 16-30.

130) Watanabe, A., Inoue, S., Okatsu, A., Eto, H., Oguro, M., & Kataoka, Y. (2023). Complementary and alternative medicine use by pregnant women in Japan: a pilot survey. *BMC complementary medicine and therapies, 23*(1), 298.

131) Wei, D., Chen, X., Gui, S., Jiang, J., Gao, Y., Lin, J., . . . Tang, Y. (2024). Omega-3 fatty acids and intracranial aneurysms: a Mendelian randomization study. *medRxiv*, 2024.2010. 2011.24315356.

132) Wellmer, F.-W., & Wellmer, F.-W. (1998). Mean, Variance and Standard Deviation. *Statistical Evaluations in Exploration for Mineral Deposits*, 15-25.

133) Огуй, В. СРОЧНЫЕ И ОТСТАВЛЕННЫЕ ЭФФЕКТЫ ВЛИЯНИЯ ВИРОАКУСТИЧЕСКОГО МАССАЖА НА АКТИВНОСТЬ УРОВНЕЙ НЕЙРОВЕГЕТАТИВНОЙ РЕГУЛЯЦИИ РИТМА СЕРДЦА ЗДОРОВЫХ ЖЕНЩИН МОЛОДОГО ВОЗРАСТА. *Сетевое издание «Научно-спортивный журнал», Т. 3, № 1.–2025. Журнал основан в 2023 году*, 133.