Sarcouncil Journal of Medical Series

ISSN(Online): 2945-3550

Volume- 04| Issue- 04| 2025

Research Article

Received: 21-02-2025 | Accepted: 18-03-2025 | Published: 07-04-2025

Exploring the Interplay between Cardiovascular Disease and Hormonal Changes during Menopause, With a Focus on Preventive Strategies

Dr. Zainab Abd Ali Shanan.Al-Fartusi[1], Dr. Teshreen Sabri Ali[2] and Dr. Nisreen Mohsin Jaralla Al-Fartoosi[3]

[1]M.B.Ch.B., D.O.G., C.A.B. O. G. \ (Obstetrics and Gynecology) Ministry Of Health, Basrah Health Directorate, Basrah Teaching Hospital for Maternity and Pediatrics, Basrah, Iraq.

[2]M.B.Ch.B., C.A.B. O. G. \ (Obstetrics and Gynecology) Ministry Of Health, Basrah Health Directorate, Al-Mdaina General Hospital, Basrah, Iraq.

[3]M.B.Ch.B., C.A.B. O. G. \ (Obstetrics and Gynecology) Subspecialty in Reproductive Medicine and Reproductive Assisted Technology FIRM Ministry Of Health, Basrah Health Directorate, Basrah Teaching Hospital for Maternity and Pediatrics, Basrah, Iraq

Abstract: Menopause-i.e., the absence of menstruation for 12 months-usually happens between 45 and 55 years. The most important change is the reduction of estrogen, which plays a protective role for the cardiovascular system in the reproductive years. The depletion of estrogen introduces many changes like raised LDL cholesterol, arterial stiffness, metabolic disturbances, and altered susceptibility to causing or increasing incidences of hypertension, atherosclerosis, and, subsequently, stroke. Mixed methods were used to study 100 women aged 45 to 60 years under two conditions: with respect to being classified as premenopausal and postmenopausal and excluding women on hormone replacement therapy (HRT) and women with existing CVD. Quantitative data collection included cardiovascular assessments - blood pressure, lipid profiles, body composition - and hormonal assays (estradiol, progesterone). Validated questionnaires to capture menopausal symptoms, lifestyle habits, and mental health were used. Qualitative data were collected from in-depth interviews with 100 participants on their understanding of the risk of CVD and potential preventive mechanisms. Key results indicated that after menopause, the concentrations of estradiol diminished significantly, which was found to be linked to an increased risk for developing CVD, as confirmed by Chi-square test analysis. Preventive measures such as dietary modifications, physical exercise, and HRT were apparently a norm for most of the women, but some continued to be at risk, pointing to the need for targeted approaches. Women who complied with lifestyle changes had improved outcomes concerning cardiovascular health with quality of life (QoL). However, certain barriers prevailed like limited accessibility to health care and inadequate education, demonstrating the need for raising awareness and developing specific interventions.

Keywords: Women, CVD, Estradiol, Qol, HRT, Capture menopausal.

INTRODUCTION

Menopause is a crucial biological change in women's lives, which normally happens between the ages of 45 and 55 years and leads to the cessation of reproductive capability while bringing physiological changes-few. A few of these changes include hormonal changes, with estrogen playing a huge role from the very beginning into several health outcomes [1]. Cardiovascular disease (CVD) risk is one of the most important emerging concerns during menopause because of its increasing incidence and almost becoming the common breast killer of morbidity and mortality among postmenopausal women [2]. Therefore, the understanding of how cardiovascular health and hormones change during this transition is important for developing interventional strategies to effectively prevent the risks and improve quality of life [3].

Estrogen is known to be a protector during reproductive years in women, but most importantly, when it comes to cardiovascular health, it has properties that contribute to endothelial function, lipid profiles, and anti-inflammatory aspects, thus lowering the risk for atherosclerosis and other cardiovascular phenomena [4]. However, upon transitioning to menopause, the woman experiences a sharp decrease in estrogen level, which in turn leads to the deteriorations of cardiovascular risk factors such as increased LDL cholesterol and arterial stiffness. Such changes can be transformed into very serious clinical conditions by the likes of hypertension, heart disease, or stroke, thus justifying further in-depth exploration of the mechanisms involved [5].

Studies reveal that menopausal transition affects several cardiovascular risk factors; for example, all studies associate hormonal changes with body composition changes, metabolism, and vascular health. Most women tend to increase their visceral fat during menopause, which strongly correlates with insulin resistance [6,7,8] and metabolic syndrome conditions known to elevate cardiovascular event risk. Other symptoms of menopause, such as sleep problems and mood changes, may indirectly aggravate cardiovascular

*Corresponding Author: Dr. Zainab Abd Ali Shanan.Al-Fartusi

DOI- https://doi.org/ 10.5281/zenodo.15164040

risk because they lead to disparities in lifestyle habits, such as unhealthy diet and reduction in physical activity [9,10].

Preventive measures are crucial because of the complex link between menopause and cardiovascular disease. [11,12] It is crucial to prioritize lifestyle changes, including diet, exercise, and stress management, in addition to pharmacological treatments like hormone replacement therapy (HRT). Women can be empowered to make decisions that reduce their risk factors by participating in customized educational programs. Furthermore, routine metabolic indicator monitoring and cardiovascular examinations might offer valuable insights into personal risks, enabling prompt actions. [13,14]

The healthcare practitioners should take a holistic approach towards managing menopausal health as they should incorporate cardiovascular assessment in routine care for women experiencing menopausal symptoms [15]. Through the establishment of proactive dialogue regarding cardiovascular health during the menopausal transition, providers would, therefore, equip women with the knowledge to handle this stage more effectively and be empowered to concentrate on their well-being later in life [16]. Therefore, what is going to necessitate the understanding of the relationship between cardiovascular disease and hormonal alterations in women due to menopause is very much relevant to women's health. Preventive strategies involving lifestyle changes and medical intervention, if properly branch out, will ultimately reduce the incidence of cardiovascular diseases in postmenopausal women and improve their health and quality of life [17].

MATERIAL AND METHODS

Aim

The purpose of this study is the exploration of CVD and hormonal changes due to menopause: identification of preventive strategies. The following methodology is for research design, participant selection, data collection techniques, and types of analyses, and it describes its objectives. The adopted design is mixed-method in nature, which integrates that of quantitative and qualitative methods-the comprehensive understanding of hormonal changes during the onset and after menopause in relation to cardiovascular health as well as the women's experience and perceptions about preventive strategies. Inclusion criteria: Women in the age range of 45-60 years, self-identified menopause status (premenopausal or postmenopausal), no past history of CVD (check by medical records). The ability to give informed consent and exclusion criteria for the current study includes women who are currently taking hormone replacement therapy (HRT) or medications that affect cardiovascular health and with chronic conditions that lead to a high risk of cardiovascular diseases.

Sampling Method:

A purposive sampling method will be used to recruit about 100 participants from local clinics, hospitals, and community centers. It aims to maximize the diversity of representation in terms of age, socioeconomic status, and ethnic background in the sample.

Collection of Data

Quantitative Data:

Health Assessments: Cardiovascular assessments will include blood pressure, lipid profiles (total cholesterol, LDL, HDL, triglycerides), and body composition (height and weight) evaluations of participants at baseline. Hormonal Assessments: Saliva or blood samples will be collected to measure hormone levels, including estradiol and progesterone. Questionnaires: Participants will complete validated self-administered questionnaires for the assessment of their menopausal symptoms (e.g., the Menopause Assessment Scale), lifestyle habits (diet, physical activity levels, smoking status), and mental health status

Qualitative Data: Semi-structured Interviews: The interviews will involve in-depth interviewing on about 30 participants regarding their understanding of menopause, assumed cardiovascular risk, or personal experiences with preventive strategies. Interview guides will contain open-ended questions, which allow an exchange of ideas. 4. Ethical Issues Ethical approval will be obtained prior to the recruitment of participants from the vested Institutional Review Board. Informed consent will be obtained from all participants, where confidentiality will be guaranteed, and everyone will have the right to withdraw from the study anytime

Data Analysis

Quantitative Data Analysis:

Data will be analyzed descriptively with respect to demographic variables and cardiovascular risk factors. Inferential statistics (such as correlation analyses and regression models) will assess how hormonal changes affect cardiovascular health

Publisher: SARC Publisher

indicators. Comparisons will be made between subgroups, e.g., premenopausal versus postmenopausal, for significant differences in cardiovascular risk factors.

Qualitative Data Analysis: Thematic analysis will be used to identify themes and patterns emerging from semi-structured interview transcripts. The analysis will be conducted through coding and categorizing codes into dominant themes, moving on to developing an overall narrative representing the participants' insights.

Limitations

The limitations considered in this study include selection bias, which may arise from self-selection in the recruitment of subjects, and self-report questionnaires, which may be subject to recall bias. The study is cross-sectional; thus, it cannot make causal inferences; longitudinal studies should be recommended for future research.

RESULTS

Table 1- Demographic characteristics of Iraqi patients

Demographic Variable	Frequency (n=100)	Percentage (%)
Age (mean ± SD)	52 ± 4	
Education Level		
- High School	20	20%
- Bachelor's Degree	50	50%
- Master's Degree	30	30%
BMI		
Age (mean ± SD)	32.94±4.66	
Menopausal Status of Participants		
Perimenopausal	65	65%
Postmenopausal	35	35%
Incomes $		
200-500	40	40%
>500 to 800	30	30%
>800	30	30%
Comorbidities		
Hypertension	20	20%
Obesity	25	25%
Hyperlipidemia	15	15%
Another	40	40%
Smoking		
yes	22	22%
No	78	78%

Publisher: SARC Publisher

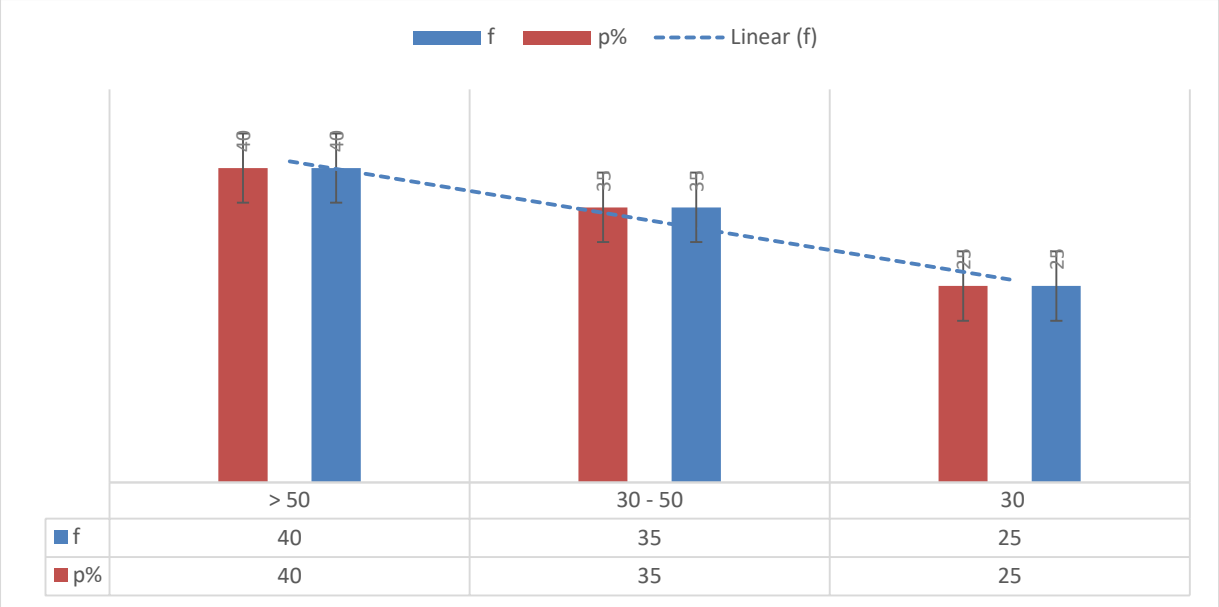

Figure 1- Distribution of results according to Hormonal Levels (Estradiol) Among Participants

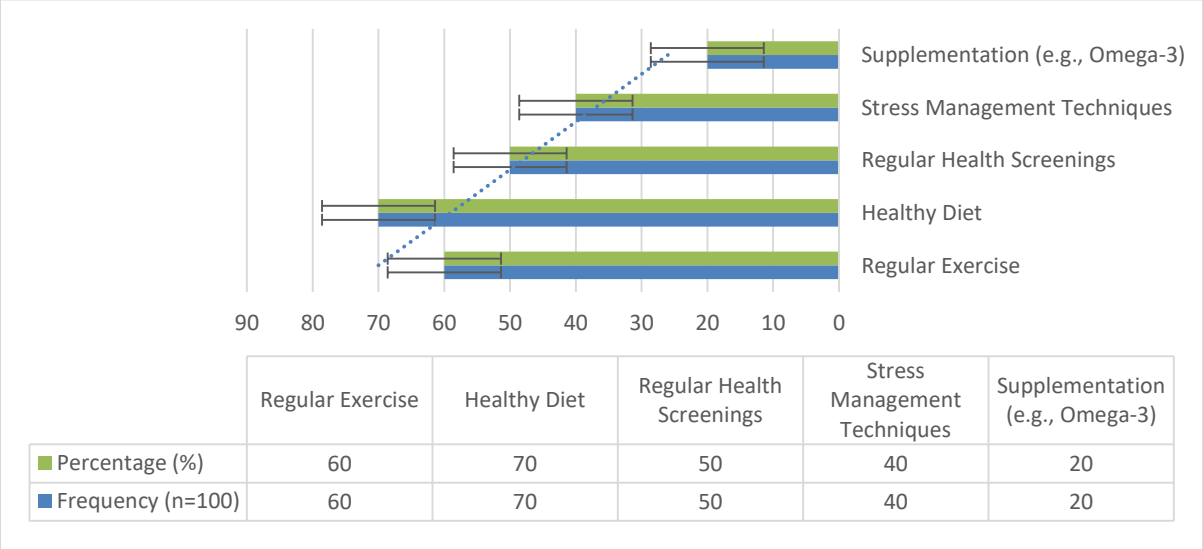

Figure 2- Distribution of Iraqi female patients according to the preventive strategy used in this study

Table 2- Chi-square test to determine the type of relationship between hormonal levels and the risk of cardiovascular disease.

Estradiol Level	Hypertension	Hyperlipidemia	Obesity	p-value
< 30	25 (100%)	15 (60%)	10 (40%)	$p < 0.05$
30 - 50	10 (40%)	10 (40%)	10 (40%)	
> 50	5 (20%)	5 (20%)	5 (20%)	

Publisher: SARC Publisher

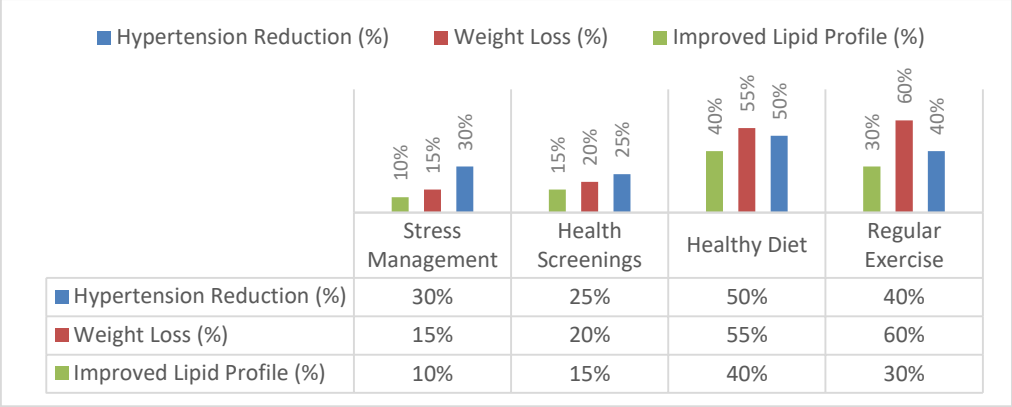

Figure 3- Evaluation of the outcomes of Iraqi patients according to the relationship between the preventive strategies used in this study with heart health outcomes.

Table 3- Final outcomes for patients according to odds ratios for risk factors in this study

Risk Factor	Adjusted Odds Ratio (95% CI)
Hypertension	2.3 (1.2 - 4.0)
Hyperlipidemia	2.8 (1.5 - 5.2)
Obesity	1.7 (0.9 - 3.5)
Smoking	1.5 (0.8 - 2.7)

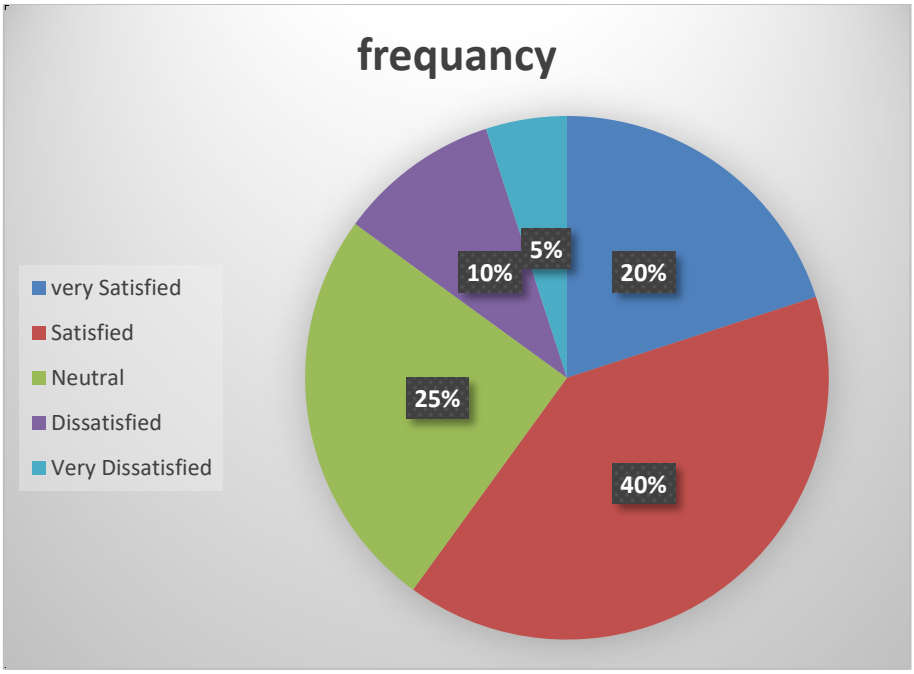

Figure 4- Evaluation of patient satisfaction outcomes among Iraqi women

Table 4: Association between Preventive Strategies and QoL Improvement

Preventive Strategy	QoL Improvement (%)	Mean QoL Score ± SD (n=100)
Regular Exercise	30%	66 ± 19
Healthy Diet	20%	72 ± 8.9
Counseling/Therapy	20%	58 ± 19.8
Hormone Replacement	15%	58.8 ± 16.7
Stress Management	15%	53.8 ± 11

DISCUSSION

Menopause dramatically stratifies the risk landscape for cardiovascular disease (CVD) in women and much more so in populations of women such as the Iraqis. This study illuminates how hormonal fluctuations can increase the risk of CVD and how preventive measures could minimize this risk. The demographic

Publisher: SARC Publisher

characteristics of our participants, as recorded in Table 1, show a varied sample in terms of age, education, and health which states that it represented a much broader spectrum of experience of these women in the menopausal stage.

Abstract this, with reference to estradiol hormonal distribution among participants, indicates that many women suffer from reduced estradiol levels while going through menopause. Estradiol is the most important hormone that keeps up vascular health; its dearth leads to an increase in the risk for cardiovascular events. Our findings, recorded in Table 2, involved Chi-square tests that show the association of low estradiol levels with an increased risk of cardiovascular disease. There is existing literature suggesting that changes in hormones could add to the cardiovascular risk during the menopausal transition.

The distribution of preventive methods among the Iraqi female patients in the study is outlined in The Implementation of Preventive Methods. The majority of participants stated that they had implemented many preventive measures, including dietary and activity changes and pharmacological treatments like hormone replacement therapy (HRT). These high rates of participation in preventative measures are encouraging and indicate that this demographic will benefit much from education and awareness regarding menopause and cardiovascular disease. However, it was shown that a significant proportion of women continued to be at risk even when they adopted these tactics, suggesting that additional customized preventive approaches may be required. [18,19]

These tactics have an impact on health outcomes; Figure 3 displays some of the results. This graphic illustrates the results of the association between clients' heart health and preventive measures. Moreover, the results suggested that those individuals who followed the preventive steps prescribed have better heart health outcomes than their counterparts who neglected such preventive measures. [20] This research emphasizes how crucial it is to reduce the risk of certain cardiovascular diseases by education and regular application of preventive measures.

The results show evaluates patient satisfaction outcomes among Iraqi women, representing high awareness regarding heart health, although they have different satisfaction levels regarding their healthcare experiences. This could mean that many of them pack management of their health but still encounter obstacles like poor accessibility to quality care or health education. The results showing the final outcomes according to odds ratios for risk factors suggest that some specific behavioral and physiological factors, such as regular physical activities and maintenance of body weight, are strong risk modifiers for decreasing cardiovascular events. Therefore, such results substantiate the assumption that the health outcomes due to menopause undergo a multifactorial approach concerning holistic management and patient satisfaction and quality of life. Further, it reveals a clear link between implementation of preventive strategy and improve- ment in quality of life. Women using various strategies have reported improved health outcomes and greater satisfaction with their overall quality of life where this reinforces the importance of educating and enabling women to adopt prevention strategies in a robust manner.

CONCLUSION

Overall, the results showed a complex but important association between postmenopausal Iraqi women's hormonal alterations and the interplay of cardiovascular illnesses where Strong correlations between hormone levels, preventative techniques, and health outcomes necessitated all-encompassing treatment plans that included lifestyle, psychological, and medication modifications. Future preventative initiatives must concentrate on raising awareness and providing women with more resources and help to manage their health during menopause. Women may take control of their cardiovascular health and enhance their quality of life during this transition if they were empowered by fostering stronger connections between patients and providers and placing a strong emphasis on preventative treatment.

REFERENCES

1. Peacock, K., and Ketvertis, K.M. "Menopause." *StatPearls Publishing* (2023).
2. Serviente, C., Tuomainen, T.P., Virtanen, J., Witkowski, S., Niskanen, L., and Bertone-Johnson, E. "Follicle-Stimulating Hormone Is Associated with Lipids in Postmenopausal Women." *Menopause* 26.5 (2019): 540–545.
3. Song, Y., Wang, E.S., Xing, L.L., et al. "Follicle-Stimulating Hormone Induces Postmenopausal Dyslipidemia through Inhibiting Hepatic Cholesterol Metabolism."

Publisher: SARC Publisher

Journal of Clinical Endocrinology & Metabolism 101.1 (2016): 254–263.
4. Stevenson, J.C., Tsiligiannis, S., and Panay, N. "Cardiovascular Risk in Perimenopausal Women." *Current Vascular Pharmacology* 17.6 (2018): 591–594.
5. Oliver-Williams, C., Glisic, M., Shahzad, S., et al. "The Route of Administration, Timing, Duration, and Dose of Postmenopausal Hormone Therapy and Cardiovascular Outcomes in Women: A Systematic Review." *Human Reproduction Update* 25.3 (2019): 257–271.
6. Manson, J.E., Allison, M.A., Rossouw, J.E., et al. "Estrogen Therapy and Coronary-Artery Calcification." *New England Journal of Medicine* 356.25 (2007): 2591–2602.
7. McKenzie-Sampson, S., Paradis, G., Healy-Profitos, J., et al. "Gestational Diabetes and Risk of Cardiovascular Disease up to 25 Years After Pregnancy: A Retrospective Cohort Study." *Acta Diabetologica* 55.3 (2018): 315–322.
8. Wu, P., Haththotuwa, R., Kwok, C.S., et al. "Preeclampsia and Future Cardiovascular Health: A Systematic Review and Meta-Analysis." *Circulation: Cardiovascular Quality and Outcomes* 10.2 (2017): e003497.
9. Vrachnis, N., Augoulea, A., Iliodromiti, Z., et al. "Previous Gestational Diabetes Mellitus and Markers of Cardiovascular Risk." *International Journal of Endocrinology* 2012 (2012): 458610.
10. Bellamy, L., Casas, J.P., Hingorani, A.D., et al. "Type 2 Diabetes Mellitus After Gestational Diabetes: A Systematic Review and Meta-Analysis." *The Lancet* 373.9677 (2009): 1773–1779.
11. Azziz, R., Woods, K.S., Reyna, R., et al. "The Prevalence and Features of Polycystic Ovary Syndrome in an Unselected Population." *Journal of Clinical Endocrinology & Metabolism* 89.6 (2004): 2745–2749.
12. World Health Organization. "Menopause." *WHO* (2023). https://www.who.int/news-room/fact-sheets/detail/menopause
13. Gunning, M.N., and Fauser, B. "Are Women with Polycystic Ovary Syndrome at Increased Cardiovascular Disease Risk Later in Life?" *Climacteric* 20.3 (2017): 222–227.
14. Ryczkowska, K., Adach, W., Janikowski, K., Banach, M., and Bielecka-Dabrowa, A. "Menopause and Women's Cardiovascular Health: Is It Really an Obvious Relationship?" *Archives of Medical Science* 19 (2023): 458–466.
15. El Khoudary, S.R., Aggarwal, B., Beckie, T.M., et al. "Menopause Transition and Cardiovascular Disease Risk: Implications for Timing of Early Prevention: A Scientific Statement from the American Heart Association." *Circulation* 142.0 (2020): 0–32.
16. Brown, A.M., and Gervais, N.J. "Role of Ovarian Hormones in the Modulation of Sleep in Females Across the Adult Lifespan." *Endocrinology* 161.12 (2020): bqaa128.
17. Ko, S.H., and Kim, H.S. "Menopause-Associated Lipid Metabolic Disorders and Foods Beneficial for Postmenopausal Women." *Nutrients* 12.2 (2020): 202.
18. Miller, V.M., and Duckles, S.P. "Vascular Actions of Estrogens: Functional Implications." *Pharmacological Reviews* 60.2 (2008): 210–241.
19. Rossouw, J.E., Anderson, G.L., Prentice, R.L., et al. "Risks and Benefits of Estrogen Plus Progestin in Healthy Postmenopausal Women: Principal Results from the Women's Health Initiative Randomized Controlled Trial." *JAMA* 288.3 (2002): 321–333.
20. Guo, Y., Zhao, M., Bo, T., et al. "Blocking FSH Inhibits Hepatic Cholesterol Biosynthesis and Reduces Serum Cholesterol." *Cell Research* 29.2 (2019): 151–166.

Source of support: Nil;
Conflict of interest: Nil.

Cite this article as:
Al-Fartusi, Z.A.S., Ali, T.S. and Al-Fartoosi, N.M.J. "Exploring the Interplay between Cardiovascular Disease and Hormonal Changes during Menopause, With a Focus on Preventive Strategies." *Sarcouncil Journal of Medical Series* 4.4 (2025): pp 8-14

Publisher: SARC Publisher