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RESEARCH

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The Impact of Hormonal Changes in Elderly Women: A Literature Review

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Abstract

As women age, hormonal changes become increasingly common and can significantly impact their overall health and well-being. In elderly women, these changes can lead to a range of physical and emotional symptoms that can greatly affect their quality of life. To further understand the health problems that arise from these hormonal changes, this study focused on menopause and andropause. The research methodology used in this study was a literature review. A total of 14 articles from PubMed, ScienceDirect, and PLOS One were reviewed, while established inclusion and exclusion criteria were taken into consideration. The findings suggest that a majority of postmenopausal women experience side effects from hormonal changes, including both physical and mental ailments. Menopause can also lead to sexual dysfunction, as well as an increased risk of osteoporosis, cardiovascular diseases, cancer, mental disorders, and chronic kidney disease. These changes can significantly impact an elderly individual's quality of life.

Keywords: Menopause, Elderly, Health Impact.

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1. INTRODUCTION

According to United Nations data, the number and proportion of people aged 60 years and over in the population is on the rise. In 2020, the number of people aged 60 and over reached 1 billion, and it is projected to increase to 1.4 billion in 2030 and 2.1 billion in 2050 (WHO, 2023). This increase in the number of elderly people will be especially rapid and unprecedented in developing countries over the next few decades.

The increase in life expectancy has caused the world's elderly population to grow rapidly, and every country is experiencing an increase in its elderly population (WHO, 2021). The consequences of the Aging Process are inevitable in human life span and health. Despite an increase in life expectancy, the trend of the elderly population is also growing rapidly and causing increasing morbidity and mortality rates associated with aging.

WHO categorizes elderly people into three groups based on age: early elderly aged 46-55 years, late elderly aged 56-65 years, and seniors aged 65 or older (WHO, 2021). The aging population has increased health issues among the elderly due to physiological and hormonal changes. As people age, various health problems arise due to physiological changes in all organ systems. Hormonal and metabolic changes associated with aging greatly contribute to major age-related chronic diseases, such as atherosclerosis, hypertension, diabetes, hyperlipidemia, obesity, sarcopenia, osteoporosis, thrombogenesis, chronic inflammation, and decreased immune function (Gusev & Sarapultsev, 2023; He et al., 2021; Rea et al., 2018). The decline in brain function is another health concern related to aging, which is mostly linked with the emergence of degenerative brain diseases and various types of dementia causing cognitive decline.

Aging adversely impacts not only hormonal secretion but also their biological availability (e.g., sex hormones) and their effects on targeted organs (e.g., insulin resistance). In addition, many metabolic changes, especially those related to hormonal actions, are related to lifestyle modifications that commonly occur with age. The effects of aging on the endocrine system affect hormone production, especially reproductive hormones. In elderly women, the production of the hormones estrogen and progesterone decreases, triggering menopause. Hormonal changes can also affect bone and muscle metabolism. Research shows that menopause in women marks musculoskeletal changes that worsen due to a lack of estrogen needed for bone and soft tissue remodeling (Amarya et al., 2018).

Despite numerous studies conducted on the hormonal and metabolic changes associated with aging in various countries, there remains a shortage of updated and comprehensive literature reviews. The purpose of this systematic review is to provide a comprehensive summary of the changes that occur with aging and explore ways to prevent or slow down these changes for the betterment of elderly women's well-being.

2. RESEARCH METHOD

The method used in this research is a literature review, namely a search for international and national literature using a database. The databases used to collect articles were PubMed, ScienceDirect, and PLOS One. The types of studies reviewed are all types of articles that use cross-sectional research methods whose contents analyze reproductive health problems caused by hormonal changes in the elderly, especially menopause and andropause. The inclusion criteria used were full-text open-access research articles published in 2017-2022 and originating from international English-language journals. The exclusion criteria used were research conducted not on humans, not a cross-sectional study, not discussing the influence of menopause and andropause, not being subscribed to by the University of Indonesia, and not discussing hormonal changes and their impacts. The keywords used in the article search were "menopause," "andropause," and "cross-sectional." The database used will be screened for keywords and inclusion criteria; all articles that do not match will be executed directly. In the

initial stage of searching for journal articles, 637 articles were obtained from the database from 2017 to 2022. Of this number, only 15 of them met the inclusion criteria for review.

3. RESULTS AND DISCUSSION

We reviewed a total of 687 studies and collected 571 papers from PubMed, 8 from PLOS One, and 58 from Science databases. After eliminating non-English journals, we further screened 636 papers based on their relevance to our study's aims. By evaluating their titles, abstracts, and study designs, we selected 14 articles that discussed hormonal changes and their impact on elderly women (Figure 1). Most studies (38.5%) were conducted in India, and 76.9% were in Asian countries, such as India, Iran, Taiwan, Turkey, and China (Table 1).

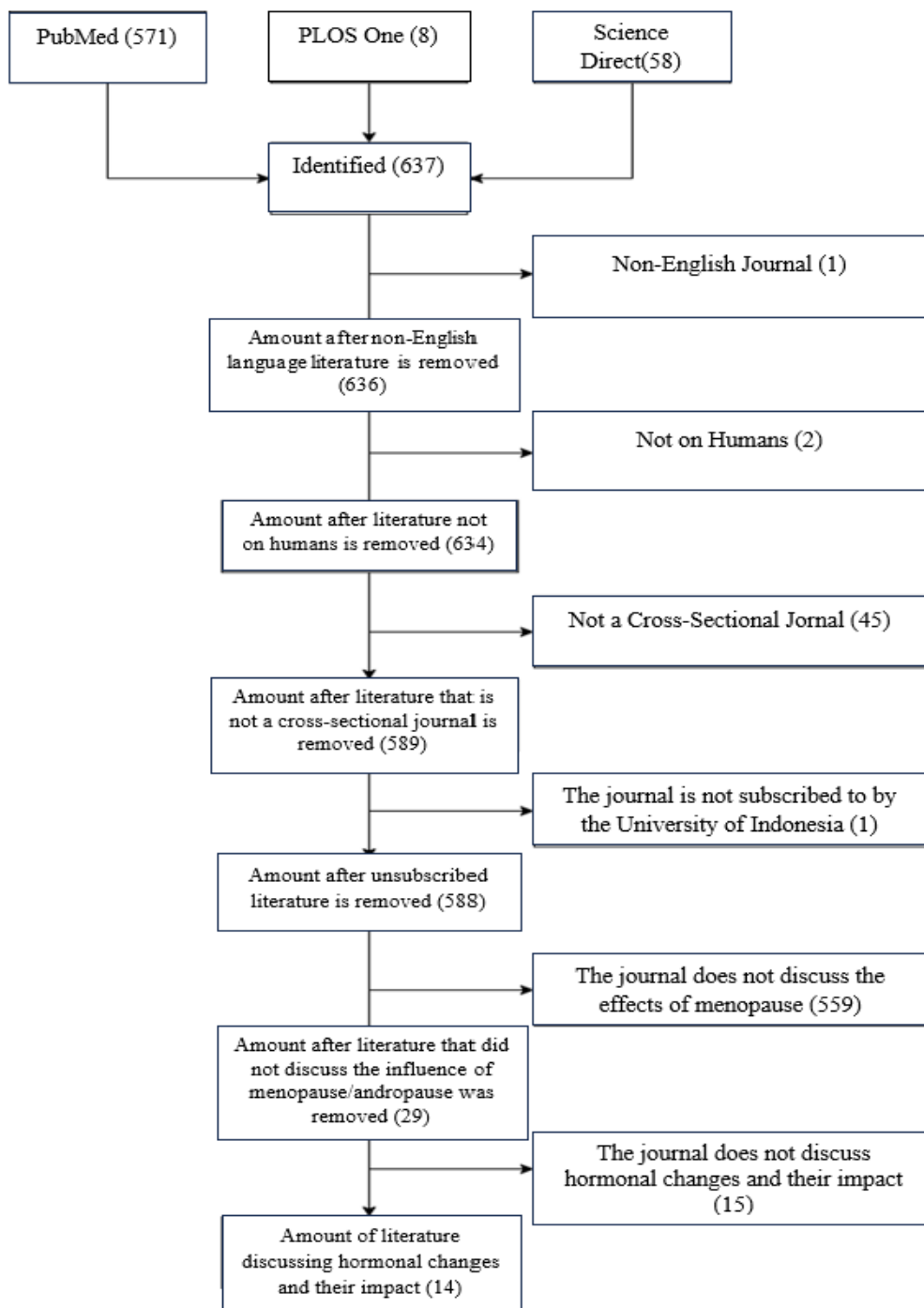


Figure 1. PRISMA Flow Chart of Study Selection

Table 1. The Summary of the Reviewed Articles

Title	Author, Year	Study Design	Country	Main Findings
Fracture risk in surgical and natural menopause	(Utkan Karasu et al., 2021)	Cross-sectional	Turkey	The study found that the risk of hip fracture was higher in natural menopause patients when bone mineral density (BMD) was taken into account ($p=0.023$). Lumbar vertebrae T-scores were similar between the two groups, regardless of age. However, femoral neck T-scores were higher in surgical menopause patients (T-score=-0.8) than in natural menopause patients (T-score=-1.25) under the age of 60. This difference disappeared after the age of 60.
Predictors of Osteoporosis and Osteopenia in Postmenopausal Women	(Khinda et al., 2022)	Cross-sectional	India	Higher systolic blood pressure (95%CI: 1.22-3.11 & 1.08-2.49), triglyceride levels (95%CI: 1.21-3.10 & 1.42-2.51), poor sleep quality (95%CI: 1.91-2.47 & 1.76-3.47), and C-reactive protein levels (95%CI: 2.18-3.56 & 1.03-2.18) were identified as independent variables influencing the risk of osteoporosis and osteopenia.
Impact Hormonal in Vulvovaginal Atrophy	(Palacios et al., 2019)	Cross-sectional	Spain	87.3% of patients had confirmed vulvovaginal atrophy (VVA). Among sexually active women ($n=717$), almost 80% reported pain during intercourse. Patients with confirmed VVA ($n=1,028$) were older ($P<.0001$), had lower rates of sexual activity ($P<.05$), and used more VVA treatments ($P<.05$) than patients without confirmed VVA ($n=66$).
High Circulating Follicle-Stimulating Hormone Level Is a Potential Risk Factor for Renal Dysfunction in Post-Menopausal Women	(Li et al., 2021)	Cross-sectional	China	A high level of follicle-stimulating hormone (FSH) is an independent risk factor for renal dysfunction in postmenopausal women. Aging may exacerbate the association between high FSH levels and reduced renal function.
Vital roles of age and metabolic syndrome-associated risk factors in sex-specific arterial	(Tsai et al., 2017)	Cross-sectional	Taiwan	Arterial stiffness increases more in women than men as they age, with 50 being the most

stiffness across nearly lifelong ages: Possible implication of menopause				critical factor across genders. Both menopause and andropause may play a role.
Impaired Quality of Life and Its Determinants among Postmenopausal	(Kumari et al., 2020)	Cross-sectional	India	Impaired QoL was associated with younger age (AOR: 4.6, 95% CI: 2.12–9.98), tobacco consumption (AOR: 2.0, 95% CI: 1.05–3.82), not being satisfied concerning husband (AOR: 3.33, 95% CI: 1.84–6.06), not having autonomy in health-care decision-making in the family (AOR: 2.30, 95% CI: 1.12–4.73), history of reproductive tract infection (AOR: 4.57, 95% CI: 1.71–12.19), and earlier onset of menopause (AOR: 3.26, 95% CI: 1.18–8.96)
Cardiovascular Risk in Menopause	(Abbas et al., 2018)	Cross-sectional	India	Women in surgical and natural menopause had significantly higher cPWV and baPWV compared to those in the premenopausal group.
Quality of Life-Based on Psychological among Postmenopausal Women	(Krishnamoorthy et al., 2018)	cross-sectional	India	According to the study, 37.2% of the participants had poor quality of life (QOL) with a 95% confidence interval of 30.8% to 44.0%. The study found that individuals who belonged to the Hindu religion (annual percentage rate [aPR] -4.14), lived in nuclear families (aPR-2.31), had chronic comorbidities (aPR-5.52), and were alcohol/tobacco users (aPR-6.03) had a significantly higher risk of poor QOL.
Risk factors for sexual dysfunction among postmenopausal women:	(Tavoli et al., 2021)	Cross-sectional	Iran	Nearly half of women seeking gynecologic care experienced sexual dysfunction during menopause. Those with sexual dysfunction also reported higher rates of anxiety and depression.
The impact of menopause on sexual function in women	(Khalesi et al., 2020)	Cross-sectional	Iran	Out of 215 participants, 78 women (36.28%) reported female sexual dysfunction (FSD) and 37 men (17.2%) reported erectile dysfunction (ED). Among the men who reported ED, 18 (8.37%) had mild ED, 12 (5.58%) had mild to

				moderate ED, and 7 (3.25%) had moderate ED. In female participants, low scores on the subscales of the Female Sexual Function Index (FSFI) mostly impaired sexual satisfaction.
Psychological Status and Oxidative Stress in Postmenopausal Women	(Chandankhede et al., 2021)	Cross-sectional	India	Women experiencing depression, anxiety, and low self-esteem may face an oxidative challenge, which could be linked to a decrease in estrogen levels. Postmenopausal women with higher depression and anxiety scores tend to have lower levels of superoxide dismutase.
Menopause is a determinant of breast aromatase expression and its associations with BMI, inflammation, and systemic markers	(Brown et al., 2017)	Cross-sectional	USA	Postmenopausal women had higher BMI and more breast WAT than premenopausal women. Aromatase levels were higher in the breast tissue of postmenopausal women, with levels being higher in inflamed vs noninflamed, independent of BMI.
The relationship between menopausal symptoms and burnout	(Converso et al., 2019)	Cross-sectional & non-randomized	Spain	This study found that menopausal symptoms were significantly associated with emotional exhaustion. However, social or personal resources could not moderate this relationship. In terms of depersonalization, our study showed that it was only affected by menopausal symptoms among nurses who reported low social support from superiors and colleagues, as well as low levels of optimism and resilience.
Early-onset breast cancer with body mass index, menarche, and menopause in Taiwan	(Yang et al., 2022)	Cross-sectional	Taiwan	This study suggests that having a BMI less than 24 and being premenopausal are associated with an increased risk of early-onset breast cancer. There is a positive interaction on an additive scale.

As age progresses, there is a transition from adulthood to old age, all physiological functions begin to decline gradually. Changes in almost all biological systems characterize the aging process. Major changes occur in the endocrine system, but there are other factors that influence the aging process, such as inflammation and calorie intake, which are also related to age-related chronic diseases.

The endocrine system undergoes major changes during old age, and the pattern of hormone secretion produced by the hypothalamic-pituitary axis changes, as well as its sensitivity to negative feedback from end hormones. Triggers that determine the aging process in the hypothalamus and pituitary.

In elderly women, Menopause is an inevitable physiological process that refers to the time when menstrual periods stop permanently. Fluctuations and deficiencies in hormone levels during post-menopause can cause changes in women's sexual function (Khalesi et al., 2020). Menopausal women experience a decrease in estrogen levels, causing changes in the psychology, histology, and anatomy of the urogenital area (Palacios et al., 2019). In general, hormonal changes in the elderly affect their physical, sexual, and psychological conditions and quality of life.

a. Physical Changes

As we age, anatomical and physiological changes occur, age-related changes occur. Based on the cross-sectional study in the journal above, it was found that in the range between the ages of 40 and 66 years, there was an increase in body weight in the elderly on average of 0.3 to 0.5 kg per year and then remained stable or even continued to increase until the age of 70 years. However, several other longitudinal studies show that there is a decrease in body weight (not exceeding 0.3% per year) in elderly men and women after the age of 60 years. Changes in body weight show an increase in body fat and a decrease in lean tissue. Body fat increases by an average of 1% per year in both men and women from the age of 40, and loss of lean tissue occurs in skeletal muscle and organs such as the liver (Krishnamoorthy et al., 2018). This change in body composition results in changes in metabolic function because lean tissue is the main determinant of energy needs. A gradual and progressive decrease in hormone production and action has a negative impact on human health by increasing the risk of chronic diseases. The impact of hormonal changes on various chronic conditions can result in several diseases, such as diabetes, cardiovascular disease, and dementia.

Elderly women experience physical changes caused by hormonal changes. Various age-related hormonal and metabolic changes greatly contribute to major age-related chronic diseases and decreased physiological function, including atherosclerosis, diabetes, hypertension, hyperlipidemia, obesity, sarcopenia, osteoporosis, thrombogenesis, chronic inflammation, and decreased immune function. In this study, physical changes that are highly prevalent in the elderly are discussed, namely cardiovascular diseases (CVD), osteoporosis, kidney disorders, and an increased risk of breast cancer.

b. Cardiovascular

Cardiovascular disease (CVD) is a group of heart and blood vessel disorders consisting of coronary heart disease and cerebrovascular disease. peripheral arterial disease, rheumatic heart disease, congenital heart disease, deep vein thrombosis, and pulmonary embolism (WHO, 2021). Risk factors for cardiovascular disease are unhealthy diet, lack of physical activity, tobacco consumption, and harmful alcohol use. Apart from that, menopause also has the potential to be related to cardiovascular events. Menopause strengthens the relationship between C-reactive protein and pulse wave velocity (PWV) regardless of age. There is a chance

that menopause is associated with increased inflammation, leading to increased blood vessel stiffness and cardiovascular risk (Woodard et al., 2011).

It was found that the group of women with natural menopause had significantly higher systolic and diastolic blood pressure compared with the premenopausal and surgical menopause groups. Additionally, it was found that cfPWV and baPWV were found to be significantly higher in the natural menopause and surgical menopause groups when compared with the premenopause group (Abbas et al., 2018). However, women with surgical menopause have greater arterial stiffness, likely resulting from the physiologic effects of hysterectomy on arterial health. In women, increased arterial stiffness appears to increase after menopause, most likely due to estrogen deficiency. Estrogen deficiency causes a decrease in the protection of various systems/organs in a woman's body (Sugiritama & Adiputra, 2019). Research conducted by Tsai et al. (2017) showed a similar thing: after the age of 50, the baPWV ratio in men and women increased by 2.4 times (Tsai et al., 2017). In both women and men, significant increases in arterial stiffness were only found at ages associated with menopause and andropause.

c. Osteoporosis (physical)

Menopause is a natural biological process that marks the end of the menstrual cycle and usually occurs in women between 45 and 55 years old. A woman is considered to have reached menopause if she has not had a menstrual period for at least 12 consecutive months. During menopause, estrogen hormone levels decrease while follicle-stimulating hormone (FSH) levels increase, resulting in the thinning of ovarian follicles. Surgical menopause occurs when both ovaries are surgically removed, leading to menopause (Rodriguez & Shoupe, 2015). The ovaries function as estrogen producers, inhibiting bone resorption to prevent osteoporosis (Parker, 2014). Based on a study by Rodriguez et al., menopause can cause bone loss during the pre-menopausal period. Bone loss occurs more rapidly in patients who undergo oophorectomy at an early age before natural menopause, but oophorectomy after natural menopause does not affect bone density (Rodriguez & Shoupe, 2015). Other research states that the severity of osteoporosis and the risk of bone fractures in menopause occurs when women enter menopause naturally (Utkan Karasu et al., 2021).

Several risk factors contribute to the incidence of osteoporosis in the elderly, as shown in research conducted in Punjab, India. These risk factors include low body mass index, high systolic blood pressure, C-reactive protein (CRP), and Triglycerides, and lack of sleep (Khinda et al., 2022). There is a strong correlation between a higher lipid profile, especially triglycerides, with impaired bone mass, weak bone mineral metabolism, and increased fractures (Sivas et al., 2009). It has been clarified through meta-analysis that hypertension is associated with bone loss and a higher risk of fracture. In addition, hypertension has been implicated in severe loss of bone minerals, including calcium, and its metabolism results in accelerated bone resorption (Strazzullo et al., 1983). Not only that, poor quality and quantity of sleep can affect bone health by causing deformities and reducing the ability of bones to heal from fractures (Luyster et al., 2012). Besides that, high levels of CRP as a marker of inflammation are the strongest risk factor for osteoporosis because they reduce bone mass density in pre- and postmenopausal women (Khinda et al., 2022).

d. Kidney Disorders

The kidneys are one of the important organs in the body and function to maintain environmental stability in the body (Rivandi, 2015). As age increases, kidney function decreases, which is characterized by a decrease in GFR (Glomerular Filtration Rate) (Li et al., 2017). Another factor that influences the decline in kidney function is menopausal status, where hormonal changes occur in the body during the pre-menopausal and post-menopausal stages.

When women experience menopause, the production of the hormone estrogen decreases; in menopause, this hormone has a role in protecting the function of a person's kidneys so that when the production of the hormone estrogen decreases, the risk of developing chronic kidney disease increases (Li et al., 2021). This is supported by the results of other studies, which state that women who have experienced menopause are at greater risk of developing chronic kidney disease due to decreased levels of the hormone estrogen (Horstman et al., 2012). In contrast to the decrease in estrogen hormone levels in post-menopausal women, FSH (Follicle-stimulating hormone) levels increase. Along with the increase in FSH, serum creatinine also increases (Li et al., 2021).

FSH is a gonadotropin hormone released by the pituitary gland and distributed through the bloodstream (Onizuka et al., 2019). In line with research conducted by Qihang (Qihang, 2017), FSH levels in research conducted on pre-menopausal and postmenopausal women in Tokyo, Japan showed similar results. These results are that in pre-menopausal women, FSH levels in urine tend to be low when compared to E1 and E2 (Estrogen, which acts as an indicator in menopausal women), while in post-menopausal women FSH levels increase and E1 and E2 decrease (Onizuka et al., 2019). Increased creatinine caused by increased FSH causes glomerular filtration function to decrease, and this can cause the risk of developing chronic kidney disease to be 2-10 times greater when compared to women who have low FSH levels (Li et al., 2021).

e. Breast cancer

Menopause is associated with significant changes in hormone levels, which contribute to physical and biological consequences that impact the occurrence of several diseases. Menopausal status is often associated with an increased risk of cancer. Some reproductive cancers, especially breast cancer, are more common in women after menopause. Despite low circulating estrogen levels, most breast cancers occurring after menopause are estrogen-dependent, and the risk of breast cancer in these women increases with obesity and metabolic syndrome (Brown et al., 2017).

Aromatase is the enzyme that catalyzes the final and key step in estrogen biosynthesis. Given the low concentrations of circulating estrogen after menopause, it is scientifically suspected that estrogen originating from the breast is the primary driver of breast cancer growth and tumors that have the capacity to increase further local estrogen production, which was ultimately proven by reports that the highest levels and activity of aromatase are found in breasts containing tumors. Studies in mice and women have shown that increased body weight or body mass index (BMI), as well as associated white adipose tissue inflammation (WATi), is positively correlated with aromatase in breast tissue (Brown et al., 2017).

The results of a study conducted by Brown et al. (2017) highlighted the potential importance of locally produced estrogen in the development of breast cancer after menopause, showing that pre-and postmenopausal women, the majority, develop estrogen receptor-positive breast cancer. In addition, the study results also showed that across the BMI range, postmenopausal women had higher breast aromatase expression than premenopausal women. This research also shows that certain obesity-related parameters are more strongly associated with increased aromatase after menopause, which is a risk factor for breast cancer. A similar study was conducted by Yang et al. (2022), who showed that premenopausal status accounted for 60.3% of early-onset cases and increased the risk 4.59-fold of early-onset breast cancer (Yang et al., 2022). Furthermore, whether BMI status is < 24 or premenopause, the risk of early breast cancer is more significant, with a risk of 7.16 times. It is also stated that being overweight or obese in adulthood in women is associated with an increased risk of postmenopausal breast cancer, colorectal cancer, kidney cancer, liver cancer, and pancreatic cancer (Yang et al., 2022).

Although this research has some limitations, such as the use of a literature review study design and a cross-sectional study design for journal review results, it provides a comprehensive discussion of the health impacts on the elderly due to hormonal changes during the pre-menopausal and post-menopausal periods. Despite the limited literature available, the research findings are significant and provide valuable insights into this important topic.

f. Sexual dysfunction

Menopause can affect sexual function due to changes in sensory perception, central and peripheral nerves, peripheral blood flow, and muscle tension capacity in response to estrogen deficiency (Tavoli et al., 2021). The consequences of decreased estrogen due to menopause, such as urogenital atrophy, vaginal dryness, and decreased tissue elasticity, can result in dyspareunia and affect sexual behavior in women (Khalesi et al., 2020).

Female Sexual Dysfunction (FSD) or female sexual dysfunction is a condition that affects many women throughout the world. Sexual dysfunction is a group of symptoms, including sexual interest and arousal, orgasm, and low sexual satisfaction, as well as pain that leads to sexual dysfunction among women. Problems in sexual desire, lubrication, as well as dyspareunia are the most commonly reported sexual dysfunctions among postmenopausal women (Tavoli et al., 2021). About more than half of menopausal women experience low sexual desire (Khalesi et al., 2020). Several factors influence sexual function in postmenopausal women, including age and mental health.

The transition from reproductive age to menopausal status may further exacerbate sexual dysfunction, while the impact on mental health is somewhat more complex (Tavoli et al., 2021). The complex relationship between psychological factors, such as anxiety and depression, and sexual dysfunction can be explained by the fact that post-menopausal women experience lower self-esteem and body image, both of which lead to reduced sexual desire (Tavoli et al., 2021). Some women feel less sexually attractive because they tend to gain weight due to a slow metabolism. This problem also contributes to anxiety and depression, leading to reduced sexual function (Tavoli et al., 2021). However, poor sexual function due to hormonal and physiological changes in postmenopausal women can cause anxiety and depression. Thus, there is a cyclical pathway between psychological factors and sexual dysfunction in women experiencing menopause.

Menopause is not only a difficult time for women, but it is also difficult for their partners. In general, women's sexual problems after menopause play an important role in determining a couple's sexual function. Post-menopausal women who suffer from sexual dysfunction tend to avoid sexual intercourse to reduce vaginal burning during sexual intercourse. Attitudes and feelings towards sex, faced with the reality of aging and menopause symptoms in female partners, also influence sexual life (Khalesi et al., 2020).

Apart from FSD, postmenopausal women also experience other disorders caused by a decrease in estrogen, one of which is physical changes in the form of vaginal atrophy (Goldstein et al., 2013). Vulvovaginal atrophy is a condition where the lining of the vagina becomes thin and dry; this is caused by a decrease in estrogen levels, with estrogen playing a role in maintaining moisture and thickness of the urogenital area (Palacios et al., 2019). Apart from the reduced humidity and thickness of the urogenital area due to decreased estrogen levels, the elasticity and blood flow to this area are also reduced compared to women who have not experienced menopause (Palacios et al., 2019).

Symptoms that are often felt by postmenopausal women with vulvovaginal atrophy are vaginal dryness, pain during intercourse, bleeding before or after intercourse, itching or burning in the urogenital area, dysuria, and abdominal pain (Palacios et al., 2019). Apart from that, another symptom felt by post-menopausal women who experience vulvovaginal atrophy is a

loss of desire for sexual activity (Parish et al., 2013). The emergence of symptoms of vulvovaginal atrophy in postmenopausal women causes disturbances in sexual function, where sexual function disorders are twice as large as those found in postmenopausal women with confirmed vulvovaginal atrophy (Palacios et al., 2019). In line with research conducted by Palacios in Spain regarding the prevalence of vulvovaginal atrophy, a previous study revealed that 51% of women in the United States who experience post-menopause experience symptoms of vulvovaginal atrophy (Parish et al., 2013).

Apart from having an impact on changes in sexual function, hormonal changes also have an impact on other aspects of health, such as osteoporosis, kidney problems, decreased quality of life, cardiovascular disease, and psychological disorders (Cheng et al., 2022; Wang et al., 2023).

g. Quality of Life

Quality of Life (QOL) is an individual's perception of their position in life in the context of the cultural and value systems they live by and their relationship to their respective goals, expectations, standards, and concerns (Teoli & Bhardwaj, 2023; WHO, 2012). The Menopause-Specific Quality of Life Questionnaire (MENQOL) is used specifically for menopausal women. This questionnaire is used as a tool to measure certain symptoms during menopause, such as disturbances in emotional, physical, and social aspects of a person's life (Radtke et al., 2011). Various symptoms that arise due to menopause can affect a person's quality of life or QOL—starting from impacts in the form of vasomotor, psychological, physical, and urogenital (Kumari et al., 2020).

In several areas in India, both urban, rural, and slum areas, descriptive cross-sectional research has been carried out to see the impact of menopause on QOL. It was found that menopause impacts QOL (Kaur Kang et al., 2021; Krishnamoorthy et al., 2018; Kumari et al., 2020). The difference is only in prevalence. In urban areas, more than a third of postmenopausal women have poor QOL due to the effects of menopause. Most suffer from psychological problems, followed by some vegetative problems and urogenital problems (Krishnamoorthy et al., 2018). In rural areas, the same thing is found, namely that QOL decreases in women who experience menopausal symptoms, and this has an impact on their physical, mental, and social well-being (Kaur Kang et al., 2021). Finally, in slum areas, it was found that more than $\frac{2}{3}$ of menopausal women experienced a decline in QOL due to the symptoms they experienced (Kumari et al., 2020). The most common impact is discomfort in the joints and muscles. Next, hot flashes, irritability, and physical and mental fatigue follow. From these three studies, it can be concluded that menopause has an impact on QOL. Menopausal symptoms experienced by elderly women cause QOL to decrease. However, each region has different severity and prevalence.

h. Psychological

Menopause is a process that causes changes in women's physical, psychological, and cognitive aspects (Nelson, 2018). According to studies, the symptoms of psychological changes that arise during menopause are caused by hormonal changes. Socio-cultural factors related to perceptions about menopause and individual personality factors also influence psychology. The symptoms of psychological changes experienced can differ for each individual; some may not feel any changes. This follows the results of research by Manju et al. (2021), which states that not all post-menopausal women experience high levels of anxiety, low self-esteem, and depression (Chandankhede et al., 2021). However, research conducted by Manju et al. (2021) and Jafari et al. (2014) found that post-menopausal women experienced higher levels of anxiety and depression scores as well as lower levels of mental health, quality of life, and enthusiasm.

A woman can experience psychological stress due to menopause, but of course, psychological instability, depression, and anxiety are not caused by menopausal status alone (Chandankhede et al., 2021). Research conducted by Daniela et al. (2019) on nurses working in two Italian public hospitals included social (e.g., support from superiors and colleagues) and personal factors (such as confidence in one's own abilities, resilience, and optimism) as influencing factors in the appearance of menopausal symptoms (Converso et al., 2019). Apart from that, the research also obtained results that menopausal symptoms were positively related to emotional exhaustion, which is a component of burnout.

4. CONCLUSION

As we age, our physiological function gradually declines. This aging process leads to changes in almost all biological systems, with major changes occurring in the endocrine system. These changes impact the health of elderly women, especially when they enter menopause. Menopause can lead to Female Sexual Dysfunction (FSD), an increased risk of non-communicable diseases such as coronary heart disease, a decreased Quality of Life, an increased risk of cancer, an increased risk of psychological disorders, and chronic kidney disease caused by increasing FSH levels and decreasing estrogen levels with age. However, positive lifestyle modifications such as physical activity and a balanced diet can have a positive effect on endocrine function and metabolism. These modifications can also act as a countermeasure against various age-related diseases. The results of this research can aid in educating the public about hormonal changes that not only cause menopause but also result in various other health impacts.

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