

Original Research

## MENOPAUSAL SYMPTOMS AND FISH CONSUMPTION OF MENOPAUSAL WOMEN IN THE COASTAL AREAS OF SOUTHEAST SULAWESI, INDONESIA

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### ABSTRACT

**Background:** Menopausal symptoms are common problem in menopausal women. The severity of menopausal symptoms is influenced by the interaction of biological, genetic and nutritional factors.

**Objective:** This study aimed to determine correlation between menopausal symptoms and fish consumption of postmenopausal women in the coastal areas.

**Method:** This was a cross-sectional study conducted on 234 postmenopausal women in the coastal areas of Southeast Sulawesi. Severity of menopausal symptoms was assessed using Menopause Rating Scale (MRS). Quantity of fish consumption was calculated using 24-hour recall questionnaires. Frequency of fish consumption was evaluated using Food Frequency Questionnaires (FFQ). Data analysis used Chi-square test with a significance value of  $p=0.05$ .

**Results:** The majority of fish consumption was sufficient in quantity (81.6%) and frequency (95.3%). Menopausal symptoms are found to be very mild (14.1%), mild (36.3%), moderate (38.5%), and severe (11.1%). There was a correlation between menopausal symptoms and the quantity of fish consumption ( $p=0.000$ ), and between menopausal symptoms and the frequency of fish consumption ( $p=0.000$ ).

**Conclusion:** There was a correlation between menopausal symptoms and fish consumption of postmenopausal women, both in the quantity and frequency. Therefore, increasing the quantity and frequency of fish consumption will reduce the severity of menopausal symptoms.

**Keywords:** coastal areas, fish consumption, menopausal symptoms

### BACKGROUND

The increased life expectancy of women causes an increase in the number of menopausal women. There was a decrease of estrogen levels during menopause. Decreased estrogen levels cause a variety of health effects, such as wrinkled skin, vaginal dryness, dyspareunia, dysuria, palpitations, migraines, hot flushes and insomnia.

Clinical symptoms begin with endocrinological changes, followed by urogenitalia, vasomotor and vegetative disorders. Degenerative disorders, such as osteoporosis and cardiovascular abnormalities, will occur and continue until the post-menopausal period. Other symptoms that can be found in menopausal women are

psychological symptoms, such as anxiety, irritability, difficulty concentrating, behavioral changes, depression and libido disorders ([E. W. Freeman et al., 2007](#); [Martaadisoebrata et al., 2005](#))

There is correlation between anxiety in postmenopausal women with age, education level, income and residence status ([Saimin et al., 2018](#)). Menopausal symptoms are not always the same in every woman and various cultures ([Department of Health and Human Services & U.S. Department of Agriculture, 2015](#)). Menopause was not only a biomedical problem, but it was related to the culture of society. Japanese women, for example, were very few who experience physical and emotional complaints related to menopause. This indicates that it was not only culture and demographic differences, but it was an interaction between biological, genetical and nutritional factors ([Martaadisoebrata et al., 2005](#)).

In various reviews of immunoneuro-pathobiological studies, it was shown that neurotransmitters played a very important role in behavioral and psychiatric disorders. Serotonin was a monoamine neurotransmitter. Serotonin, both directly and indirectly, affects almost all cells in the brain and can affect mood, sexual desire, memory, appetite, sleep behavior, and social behavior. If the serotonin levels in the brain changes, the behavior will also changes. Serotonin was synthesized from the amino acid tryptophan ([Sharma et al., 2007](#)). Fish was a marine biological food source that contains high-quality protein because it was composed of amino acids with the most complete composition. Fish contains essential fatty acids, Omega-3s, such as eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA). Fish also contains tryptophan ([Bhagwagar et al., 2002](#)). Some types of fish with high tryptophan and omega-3 contents, such as mackerel, anchovy and cob, were familiar in Indonesian society and were affordable ([Kementerian Kelautan dan Perikanan Republik Indonesia, 2014](#)).

Topographically and geographically, 27% of the population of the Southeast Sulawesi live in the coastal areas ([Dinas Kesehatan Sultra, 2016](#)).

Coastal communities have characteristics that are related to fisheries business. Therefore, this study aims to determine the relationship between menopausal symptoms and fish consumption of postmenopausal women in the coastal areas of the Southeast Sulawesi.

## METHODS

### Study Design

This was a cross-sectional study conducted on June to December 2016. The population was postmenopausal women in the coastal areas of Southeast Sulawesi.

### Sampling Procedure and Data Collection

Samples were selected by simple random sampling and were previously provided by informed consent. The inclusion criteria were menopausal women aged over 50 years old and do not suffer from chronic or terminal diseases. The exclusion criteria were incomplete questionnaires. Data collection was carried out with three questionnaires. Severity of menopausal symptoms was assessed using Menopause Rating Scale (MRS). The total MRS score was 0-44. Severity of menopausal symptoms is divided into 4 categories, including very mild, mild, moderate and severe. Quantity of fish consumption was calculated using 24-hour recall questionnaire. Frequency of fish consumption was evaluated using Food Frequency Questionnaire (FFQ). Fish consumption was divided into 2 categories, including less and sufficient. Protocol of the study has been approved by the Research Ethics Committee of the Faculty of Medicine, Halu Oleo University, Southeast Sulawesi.

### Data Analysis

Statistical analysis was performed to assess the correlation between dependent and independent variables, using Chi-square test with a significance value  $p < 0.05$ .

## RESULTS

A total of 234 respondents were involved in this study. The characteristics of respondents are presented in table 1 and correlation between

menopausal symptoms and fish consumption are presented in table 2.

Table 1 show that the largest age group of respondents was 51-53 years old (42.7%). Majority of respondent were low education level (69.7%) and as housewife (82.5%).

**Table 1** The Characteristics of Respondents

Characteristics	(n)	(%)
Age (years old)		
51-53	100	42.7
54-56	75	32.1
57-60	59	25.2
Education level		
Low	163	69.7
Middle	59	25.2
High	12	5.1
Occupation		
Housewife	193	82.5
Employee	41	17.5

**Table 2** Correlation Between Menopausal Symptoms and Fish Consumption

Fish consumption	Menopausal symptoms				p-value
	Very mild n (%)	Mild n (%)	Moderate n (%)	Severe n (%)	
Quantity					
Less	0 (0.0)	0 (0.0)	20 (8.6)	23 (9.8)	0.000
Sufficient	33 (14.1)	85 (36.3)	70 (29.9)	3 (1.3)	
Frequency					
Less	0 (0.0)	1 (0.4)	4 (1.8)	6 (2.5)	0.000
Sufficient	33 (14.1)	84 (35.9)	86 (36.7)	20 (8.6)	
Total	33(14.1%)	85 (36.3%)	90 (38.5%)	26 (11.1%)	

Table 2 shows the correlation between menopausal symptoms and fish consumption. The majority of fish consumption is found in sufficient quantity (81.6%) and frequency (95.3%). Menopausal symptoms are found to be very mild (14.1%), mild (36.3%), moderate (38.5%), and severe (11.1%). The majority of respondents who had a sufficient quantities of fish consumption experience mild symptoms (36.3%), while the majority who less quantity experience severe symptoms (9.8%). There was a correlation between menopausal symptoms and the quantity of fish consumption ( $p=0.000$ ).

The majority of respondents who had sufficient frequency of fish consumption experience moderate symptoms (36.7%), while those who less frequency experience severe symptoms (2.6%). There was a correlation between menopausal symptoms and the frequency of fish consumption ( $p=0.000$ ).

## DISCUSSION

This study found that fish consumption in postmenopausal women was majority sufficient,

both in quantity and frequency. Fish is the main source of protein for the community. Every day they consume fish. Topographically and geographically, parts of Southeast Sulawesi region were located in the coastal areas. Coastal communities have characteristics that are related to fisheries business which is influenced by environmental and seasonal factors ([Khusaini & Badriyah, 2008](#)).

In this study found respondents whose quantity of fish consumption is less. This can be influenced by several factors including family income, education, and knowledge. Families with lower income and families with sufficient income but many needs will reduce their food consumption to meet other needs that are considered more important.

It found that the majority of postmenopausal women in this study had low education levels. This result was similar with previous study in coastal areas of Kendari City ([Saimin et al., 2018](#)). The main problems of coastal communities were lack of capital, quality of human resources, facilities and infrastructure, understanding of resource values and institutional problems

([Khusaini & Badriyah, 2008](#)). Previously, the U.S. Food and Drug Administration (FDA) and the U.S. Environmental Protection Agency (EPA) recommended the maximum number of fish consumption, not the minimum quantity. The development of science has gained the importance of consuming fish with the right quantities in the diet of pregnant women, breastfeeding mothers, and children ([Bhagwagar et al., 2002](#)).

This study found that the majority of respondents who consumed sufficient quantities of fish experienced mild menopausal symptoms. Sources of seafood and fish oil are known to be very beneficial for the heart, brain development in infants, and reduce hot flushes in menopausal women. This was related to the consumption of omega-3 ([Nettleton, 2009](#)). Consumption of fish will not directly increase estrogen levels. Increased fish consumption in menopausal women, who experience a decrease of estrogen levels, will balance omega-3 fatty acids in the brain ([M. P. Freeman et al., 2011](#)). Fish contains protein, consists of amino acids, which were important for health. Two essential amino acids, lysine and methionine, were commonly found in fish in high concentrations, in contrast to vegetable protein. Thus, fish and vegetable protein can complement each other to meet nutritional needs ([Murray & Burt, 2001](#)).

Menopause was a universal reproductive phenomenon. Hormonal changes during menopause cause several complaints both physical and psychological complaints. The symptoms of menopausal women were psychological, somato-vegetative, and urogenital symptoms. These symptoms included memory disorders, lack of concentration, anxiety, depression, insomnia, hot flushes, sweating, joint pain, libido disorders, vaginal dryness, urinary incontinence, and others. These symptoms cause impaired quality of life of menopausal women ([Heinemann et al., 2003](#)). Symptoms of menopause are not always the same for every woman. The prevalence of menopausal symptoms varies, both in individuals in the same population and in different populations ([Department of Health and Human Services & U.S. Department of Agriculture, 2015](#)).

Consumption of fish, containing omega-3, was associated with a reduced risk of cardiovascular disease. Omega-3 affects structural and functional walls of blood vessels. In experimental studies and clinical trials, it was shown that omega-3s were able to improve arterial hemodynamics by reducing arterial stiffness. This can clarify cardio-protective function. Recent research shows a beneficial effect of omega-3 on endothelial activation, which improves blood vessel function ([Diamond et al., 2007](#)). The results of this study were similar to research conducted by Freeman (2011) which examined the benefits of omega-3 intake for depressive disorders during the menopause transition period. The study found a significant reduction in menopausal symptoms with omega-3 intake ([M. P. Freeman et al., 2011](#)).

In this study, there was a significant relationship between the quantity of fish consumption and the severity of menopausal symptoms in postmenopausal women. Menopausal women who consume fish in sufficient quantities are found very few who experience severe symptoms of menopause. Increased intake of grilled fish may reduce the risk of heart failure, whereas increased intake of fried fish may increase the risk of heart failure in postmenopausal women ([Belin et al., 2011](#)).

Vasomotor symptoms can affect the quality of life. Cohen et al (2014) concluded their study that a 12-week treatment with omega-3 in postmenopausal and perimenopausal women did not improve vasomotor symptoms (VMS) frequency, VMS bother, sleep, or mood disorders compared with placebo ([Cohen et al., 2014](#)). Findings of Sternfeld et al (2014) provided strong evidence that 12 weeks of moderate-intensity aerobic exercise did not alleviate VMS, but might result in small improvements in sleep quality, insomnia and depression in midlife sedentary women ([Sternfeld et al., 2014](#)).

This study found that the majority of postmenopausal women who consume fish in sufficient frequency have mild symptoms of menopause. The nutritional needs of menopausal women will always be different. The pattern of consumption can reduce the severity of

menopausal symptoms. Consuming fish 4 times a week in sufficient quantities can reduce the risk of various chronic diseases, such as cancer, heart disease, and diabetes ([Mahan & Escott-Stump, 2008](#))

Consumption of fish, as a daily protein, was very good for health. Fish can be consumed by anyone, young or old, because it has a soft texture. In a study conducted in Boston in the United States, an earlier intervention study showed that administration fish oil supplementation for 3 months resulted in significantly higher levels of DHA and EPA in older women than in younger women. Continuous consumption of fish with high frequency can improve one's learning achievement because fish contain Omega 3 which is good for the brain. Omega-3 fatty acids in fish also help to regulate cell function, including neurological functions ([Mahan & Escott-Stump, 2008](#)). Lucas et al. (2009) in their study found that supplementation with ethyl-eicosapentaenoic acid (E-EPA) omega-3 fatty acids reduced hot flushes frequency and improved the hot flushes score relative to placebo ([Lucas et al., 2009](#)). [Erkkilä et al. \(2004\)](#) found that higher fish consumption was associated with a decrease in the diameter reduction of the coronary arteries and the appearance of new lesions. It was concluded that fish consumption was associated with a significantly reduced progression of coronary artery atherosclerosis in women with coronary artery disease.

## CONCLUSION

There was a correlation between menopausal symptoms and fish consumption. Increasing the quantity and frequency of fish consumption can reduce the severity of menopausal symptoms. Utilization of local food needs to be improved and preserved, so that it can be beneficial for the community.

### Declaration of Conflicting Interest

There is no conflict of interest in this study.

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