A study of the association between food intake and specific symptoms of menopause

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Abstract—Menopause is a marker of biological aging in women. It is a stage in which there is the transition from reproductive to non-reproductive stage in women's life. Menopause is a natural event occurring in a women's life. It is the permanent end of the menstrual cycle where the function of ovarian follicles stops.there is a high prevalence of menopausal symptoms during menopausal transition and women are shifting towards diet to prevent and ease these symptoms. The aim of this survey was to observe the prevalence of menopausal symptoms and to study the effect of nutrient intake on menopausal symptoms.By assessing their daily dietary intake, it was found that dietary carbohydrate consumption was low, dietary fats as high, dietary protein consumption was moderate and consumption of fruits and vegetables was also moderately. Consumption of junk food, packaged food, and carbonated beverages was high and alcohol smoking was low.A diet rich in whole grains, fiber, fruits, and vegetables and less refined cereals, and saturated fats help in lowering and preventing the severity of menopausal symptoms. In addition to that sleep cycle and physical activity may also help in lowering the menopausal symptoms.

key words —menopause, nutrients, dietary pattern, vasomotor, psychological, urogenital, cardiovascular diseases, physical activity.

I. INTRODUCTION:

Senescence or the aging process is marked by gradual and irreversible changes in any organism. In 1990, the World Health Organization introduced Active aging. Active aging aimed to increase the quality of life of aging people despite any health issues. According to the World health organization (WHO), health refers to physical, mental, and social wellbeing. Active aging projects also promoted mental health and social living with physical health. As people age, there are many physiologic changes in the body. In women, there are hormonal changes that lead to menopause (Pallikadavath et al., 2015)

Menopause is a marker of biological aging in women. It is a stage in which there is the transition from reproductive to nonreproductive stage in women's life. Menopause is a natural event occurring in a women's life. It is the permanent end of the menstrual cycle where the function of ovarian follicles stops. Perimenopause is the term used when a woman is around menopause or experiencing changes in her periods. Menopause is attained when a woman has gone through 12 months of amenorrhea. Natural menopause occurs between 45 to 55 years of age (Pallikadavath et al., 2015).

According to the 2011 census of India, the number of women aged 45 years and above was 96 million which is expected to increase to 401 million in 2026. The number of premature menopause that is before the age of 40 years has been raised. According to NFHS, 3.1 percent of women in the age group of 30 - 34 years have attained menopause, and 8.0 percent in the age group of 35 - 40 years of age (Pallikadavath et al., 2016).

Female hormones play a very important role in a woman's life. These hormones are responsible for puberty, the menstrual cycle, joy of motherhood and protects them from certain health issues. However, after a certain age, mostly after 45 years of age, all women irrespective of their health conditions or cultural backgrounds experience physical, mental, and social changes in their bodies. These changes are associated with the progressive decline of these female hormones. (Silva et al., 2021)

Menopause is a physiologic process of aging. As the woman ages, the number of ovarian follicles diminishes, and also there is a decrease in granulosa cells of the ovary. Granulosa cells produce inhibin and estradiol, therefore there is a lack of these hormones. Decreased levels of these hormones result in increased follicular stimulating hormone (FSH) and luteinizing hormone (LH) levels (Peacock et al., 2022). Ovulation, LH surge does not occur resulting in a decline in estrogen levels. This decline in estrogen hinders the hypothalamic-pituitary-ovarian axis. The hypothalamic-pituitary-ovarian axis is a system controlling the female reproductive system by balancing the cyclic production of gonadotropins and steroid hormones. This results in failure of endometrial development resulting in irregular menstruation. Decreased ovulation leads to decreased corpus luteum which results in a decline in progesterone resulting in light bleeding (Mikhael et al., 2019).

Due to all these hormonal changes in the body, women experience symptoms mostly hot flashes, excessive sweating, crying spells, difficulty in falling asleep, depression, headache, lethargy, weight gain, dryness, and itching. Menopause also increases the risk of cardiovascular diseases, diabetes, chronic respiratory diseases, osteoporosis, and cancers. Apart from this weight gain and fat mass

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increases rapidly in this phase. It does not cause immediate life-threatening conditions but it affects the quality of life (Silva et al., 2021) (Yisma et al., 2017).

These hormonal changes in the body during menopause demands special health care in women's life. But due to unawareness and lack of health programs, the health of the mid-age of women is neglected. This points out the importance of health in menopause women and women's wellness in mid-age of life. Therefore, the healthcare of menopausal women should emphasize lifestyle management, dietary habits, and balance of negative effects of estrogen deficiency to minimize the risk of metabolic syndrome, cardiovascular diseases, and osteoporosis (Kroeke et al., 2012)

II. REVIEW OF LITERATURE:

2.1 Normal menstrual cycle physiology:

Hypothalamic-pituitary-ovarian axis is an endocrine closed-loop feedback system, in this the gonadotropins stimulate ovarian hormone production, which in turn exerts a negative feedback effect on the gonadotropins, to maintain a regulated system. (Burger et al., 2007) During the reproductive age that is from puberty to menopause, the hypothalamus secretes gonadotrophin-releasing hormone. This hormone gives a signal to the anterior pituitary to secrete FSH and LH. FSH and LH provide a signal to the ovaries. (Dul, 2019)

The ovarian follicles consist of two cells: theca cells and granulosa cells, which are responsible for hormone production. LH stimulates the theca cells, resulting in the production of the hormone progesterone and androstenedione. This androstenedione hormone diffuses to the granulosa cells and FSH stimulates the granulosa cells to convert androstenedione to testosterone and further into 17 beta-estradiol which is estrogen.

As the levels of progesterone or estrogen increase, there is negative feedback to the anterior pituitary to lower the levels of LH and FSH, and thereby the levels of progesterone and estrogen also lowers. This happens in all phases of the menstrual cycle except in ovulation, in ovulation as the estrogen levels increase, this provides positive feedback to the anterior pituitary to produce increased levels of FSH and LH. In addition, in the feedback system, the granulosa cells also produce inhibin and activin, which helps in the inhibition and activation of FSH from the anterior pituitary. (Burger et al., 2007) (Thiangrajan et al., 2020)

2.2 Menopausal transition:

Menopausal transition (MT) is a period that begins four years prior to a permanent cessation of periods. It is associated with many reproductive and hormonal changes. The menopausal transition is followed by approximately 35 years of the regular menstrual cycle. It is divided into two phases: early MT and late MT. The initiation of transition is observed when a regularly menstruating woman experiences a skipped menstrual cycle or change in the days of menstruating i.e. more than six days. The women remain in early MT till she experiences more than 2 months of amenorrhea, after 2 months of amenorrhea she enters late MT. The late MT is characterized by prolonged amenorrhea. Once a year of amenorrhea is experienced Final menstrual period is defined. (Nanette et al, 2016).

2.3 Symptoms of menopause:

The symptoms of menopause vary from woman to woman depending on their lifestyle, and age. The symptoms are associated with the impaired quality of life of women. (Rathnayake et al., 2019).

2.3.1 Vasomotor symptoms:

Hot flushes and night sweats are thermoregulatory disturbances occurring in menopause. These are the most common symptoms seen in menopausal women. Hot flushes are characterized by a sudden feeling of heat in the face, neck, and chest. This feeling of heat starts in the upper part of the body and then spreads throughout the body. Hot flushes are associated with anxiety and chills. Hot flushes are characterized by vasodilation, this is done by the body to make the body thermoneutral. Night sweats are the hot flushes during the night. Due to this, there are sleep disturbances also. (Nanette et al., 2015) (Bansal et al., 2019).

2.3.2 Urogenital symptoms:

Due to fluctuations in estrogen levels during menopause, women experience some distress symptoms like vaginal itching, vaginal dryness, frequent urination, or pain or burning during urination. This distress impacts the quality of life, sexual functioning, and daily life activities. These symptoms are also due to vaginal atrophy during menopause. (Ali et al., 2020).

2.3.3 Sleep disturbances and insomnia:

Sleep quality deteriorate with aging and menopause add extra to this symptom. According to a report, women have difficulty sleeping as they enter menopausal age. Difficulty in sleeping and difficulty in staying asleep are the common symptoms experienced by menopausal women. These symptoms are mostly related to night sweats. Other than night sweats, psychological symptoms like mood swings and anxiety also contribute to disturbances in sleep. (Nanette et al., 2015) (Bansal et al., 2019)

2.3.4 Psychological symptoms:

Menopausal women experience a wide range of psychological symptoms like poor memory and concentration, depression, anxiety, insomnia, fatigue, irritability, and forgetfulness. The decline in memory is the second most common symptom of menopause.

Estrogen deficiency alters brain functioning leading to all these symptoms. These symptoms are also linked to vasomotor symptoms. (Ali et al., 2020)

2.3.6 Musculoskeletal pain:

In menopausal transition, there is a decline in bone mineral density (BMD). The BMD begins to decline 1 year prior to FMP and continues to decrease post-menopause. Due to this severe joint pain and lower back pain are observed in menopausal women. This also leads to the risk of osteoporosis and more susceptibility to fracture. Fluctuations in estradiol and FSH leads to all these symptoms in menopausal age. This decline in BMD leads to sarcopenia. Sarcopenia is a progressive loss of bone muscles. With changes in hormones, these symptoms are also due to an imbalance in muscle protein synthesis and breakdown. (Karlamangla et al., 2018)

2.3.7 Weight gain:

In MT, the decline in estradiol is associated with a decrease in lean body mass and an increase in fat mass. The basal metabolic rate also decreases simultaneously, all these symptoms contribute to weight gain and ultimately lead to obesity. Emotional distress associated with menopausal symptoms boosts the production of cytokines and free radicals resulting in more fat deposition in the body. Obesity leads to other complications like cardiovascular diseases and insulin resistance. (Woods et al., 2020)

2.4. Body composition changes during menopause:

Menopause is associated with changes in body shapes, body composition, and the depletion of fat-free mass (Fenton, 2021). Body composition is constituted mainly of 3 components: lean mass, bone mass, and fat mass. All these components are affected during menopause transition accompanied by aging (Burger et al., 2013)

Throughout their life women, experiences bone loss, and most of it is lost after menopause. Finkelstein et al. (2008) in their study showed that there is a very small change in the bone mineral density in the premenopausal stage and it declines in the perimenopausal stage. It continues to decline rapidly in the post-menopausal stage. This menopause-related bone loss has an adverse effect and can lead to fractures, osteopenia, or osteoporosis.

Sarcopenia is defined as an age-related decline in skeletal mass and its function. It is one of the main reasons for morbidity and physical disability in aged women. Changes in the hormones result in loss of lean mass resulting in sarcopenia. KO et al. (2021) in a study showed that loss of lean body mass is more in postmenopausal women.

Changes or decline in estrogen levels during the menopause transition modifies the body fat and distribution. This leads to increased body fat in the body, mainly central obesity in postmenopausal women. These changes in body fat led to an increased risk of cardiovascular diseases (Ambikairajah et al., 2019).

2.5. Health Problems in Menopause:

2.5.1Cardiovascular diseases:

Studies show that women develop heart diseases much later than men, mainly during mid-life. The mid-life of women is associated with menopausal transitions. This suggested that menopause contributes to the increase in the risk of heart diseases. The decline in estrogen results in many risk factors for cardiovascular diseases like changes in body fat decreased glucose tolerance, increased blood pressure, and changes in the plasma lipid levels (Rosano et al., 2015)

2.5.2 Osteoporosis:

The prevalence of menopause in women increases with age. In India, 42.5% of women and 24.6% of men above the age of 50 suffer from osteoporosis (Thulkar et al., 2015). In menopause, the bone turnover cycle is disrupted. This is due to the estrogen deficiency; the osteoclast's activity increases more rapidly than the osteoblasts resulting in bone loss. The bone mass density is reduced by 10% during the menopausal transition. This results in fractures and osteoporosis in menopausal women (Ji et al., 2015)

2.6. Nutrition In Menopause:

Along with lifestyle management, nutritional habits are also important as they concern all the women, they can be modified and can improve quality of life. (Silva et al., 2021). Several studies point toward the importance of nutrition in certain stages in women's life. In women, there are three important endocrine changes stages of life that are puberty, pregnancy, and menopause. Proper nutrition during these periods of life is essential (Tursunović et al., 2014).

2.6.1 Dietary protein:

According to a study, higher protein intake is associated with higher Lean Body Mass in menopausal women. Aging increases dietary protein requirements because the capacity of skeletal muscles to activate protein synthesis is reduced. (Silva et al., 2017). In the Women's Health Initiative study, higher protein intake (1.2 g/kg body weight) is associated with a 32% lower risk of weakness, tiredness, and better physical function. (Beasley et al., 2010). A study conducted by the Geriatric research center concluded that an adult woman with a higher protein diet combined with resistance/aerobic exercise resulted in significantly greater total weight loss

and fat mass loss than a similar diet containing lower protein (0.8 g/kg/d) alone combined with exercise. It also stated that loss of lean mass was greatest in those consuming 0.8 g protein/kg/d. (Gordon et al., 2012)

2.6.2 Dietary carbohydrates:

A low carbohydrate diet or a high carbohydrate diet, in particular, does not benefit menopausal women. But some carbohydrate foods such as fiber-rich, whole grains, and low glycemic index food have shown to be beneficial. Fiber-rich, whole grains, and low GI food have been shown to reduce total body fat mass and manage weight. Psyllium fiber has been shown to decrease serum cholesterol levels in postmenopausal women, this helps in lowering the risk of cardiovascular diseases (Silva et al., 2021).

A carbohydrate quality index study showed a higher intake of fiber, solid carbohydrates, and low GI foods are associated with lower psychological symptoms and somatic symptom scores. Women Health Initiative (WHI) prospective cohort study on menopausal women, also reported that higher dietary fiber intake is inversely associated with depression. In contrast, added sugars and higher GI foods showed a strong direct relationship with depression. An observational study in postmenopausal women identified that a higher intake of refined cereals is adversely associated with the incidence of depression and stress and hot flashes. (Mohsenian et al., 2021).

2.6.3 Dietary fats:

Wu et al. (2013) in a study showed that a low-fat diet lowers the concentration of total cholesterol and low-density lipoprotein cholesterol in postmenopausal women. A low-fat diet results in weight loss. A study shows that women who have lost weight were showing fewer vasomotor symptoms. (Kroenke et al., 2012). Women consuming a diet high in trans fat, saturated fats, and processed food showed higher intensity of menopausal symptoms (Noll et al., 2020)

2.6.4 Dietary phytoestrogens:

Phytoestrogens are plant compounds that are similar in structure to estrogen. There are many classes of phytoestrogens but the two main ones are isoflavones and lignans. Soybeans, beans, peanuts, walnuts, and legumes are good sources of isoflavones. Lignans are found in whole grains, seeds especially flaxseed, fruits, vegetables, rye, millet, and legumes (Chen et al., 2015).

Soy isoflavones have a higher binding capacity for estrogen β receptors than estrogen α . They bind strongly to estrogen β receptors and weakly to estrogen α receptors (Ahsan et al., 2017)

Ahsan et al. (2017) conducted a study, in which symptoms of menopause were measured after consumption of soybean for 12 weeks. The study results showed the benefits of soybean on hot flashes in the perimenopausal stage. But it did not affect the urogenital symptoms.

2.6.5 Dietary Calcium:

In menopause, the calcium absorption efficiency decreases. Calcium absorption efficiency is the percentage of the amount of consumed calcium absorbed. This is due to the estrogen deficiency, the osteoclast's activity increases more rapidly than the osteoblasts resulting in bone loss. The bone mass density is reduced by 10 % during the menopausal transition. This results in fractures and osteoporosis in menopausal women (Ji et al., 2015). Calcium requirements increase in the menopausal age. The north Indian American society recommends 1000mg - 1500mg calcium per day for a post-menopausal woman. Along with calcium, intake of vitamin D is also very important (Silva et al., 2021)

2.6.6 Fruits/ vegetables:

Higher intake of plant-based food is negatively associated with depression. Soleymani et al. (2012) found that a diet including fruits and vegetables was inversely associated with psychological and physical symptoms. Adequate intake of fruits and vegetables and mainly citrus foods and beta carotene-rich vegetables are highly associated with lowering depression in menopausal women. In a study, it has been evidenced that tomato helps in lowering the psychological symptoms. This function of vitamin is due to the high lycopene in the tomato which is high in antioxidants. The antioxidant helps in relieving stress and thus depression and anxiety. It has also shown that cruciferous vegetables cabbage and cauliflower increase the incidence of depression in menopausal women (Safabakhsh et al., 2020)

2.7. Physical Activity and Menopause:

During menopause, women experience many physical, psychological, and social changes which affect their quality of life. Many people take hormone therapy to alleviate these symptoms, but due to many severe side effects of this therapy, women are searching for a better alternative. Diet along with physical activity is the best therapy. Exercise is most commonly used as a therapy to lower or alleviate menopausal symptoms. Physical activity is associated with several health benefits such as a decreased risk of cardiovascular diseases, cancer, obesity, osteoporosis, and even depression (Kim et al., 2014). Bondarev et al. (2020) in a study concluded that high physical activity in premenopausal, perimenopausal, and post-menopausal showed fewer depressive symptoms.

III. METHEDOLOGY :

3.1 Sample size:

For this survey, the target population was 173 women 45-55 years, but for feasibility, 50% were included in the survey i.e 87 women, using a random sampling technique.

3.2 Participants:

87 female participants were included in the survey.3.2.1 Inclusion criteria:Women 45 - 55 years of age were included in the survey.

3.2.2 Exclusion criteria:

Women who were suffering from hyperthyroidism, hypothyroidism, and polycystic ovarian disease (PCOS) were excluded. Women who have done hysterectomies and taken hormone replacement therapy were also excluded from the survey.

3.3 Data collection:

A questionnaire was distributed via google form to the women of age 45- 55 years, who were not suffering from thyroid disorders, or PCOS, had not done a hysterectomy and had not taken hormone replacement therapy. The questionnaire clearly stated that the data collected will be used for research purposes only and kept confidential. The questionnaire consisted of a total of 28 questions. It was divided into a total of 5 sections.

The first section consisted of 3 questions. In this section, anthropometric data were collected, including Age, Height, and Weight. The second section included 8 questions of general information. It included questions regarding menstruation and comorbidities. The participants were questioned about their menstrual cycle duration, change in bleeding, change in how many days they bleed, are they premenopausal, perimenopausal, or postmenopausal, and about the health issues they must be suffering from.

The third section was based on the severity of the menopausal symptoms. There were a total of 19 symptoms listed. The fourth section included 2 questions that collected information about dietary patterns like diet type and meal frequencies. The third question was a food frequency questionnaire that included foods from different nutrient sources. The fifth section included 8 questions on physical activity, sleep, work, and added resting hours. This section collected information about the occupation, household work hours, sleep hours, physical activity, and added resting hours.

3.4 Data analysis:

Analysis was performed using the Statistical Programme for social science (SPSS) software. Descriptive statistics, associations, and correlations were found for the collected data. Kendall's tau b method, and Spearman rank test was used for determining the associations and correlations. Using those results further interpretation and discussion were carried out.

3.5 Limitations:

The study might have social desirability as a limitation as the data was collected using a google form, the participants might have guessed the aim of the study and might have answered it according to the researcher's expectations. They failed to provide honest answers.

The participants were not fully aware of the symptoms they are experiencing and their diet intake so they failed to provide accurate information. They might also get bored while filling out the questionnaire which may cause the inaccuracy of the answers and hence insignificant results.

IV. RESULTS AND DISCUSSIONS:

4.1 The Correlation between menopausal symptoms and FFQ:

The prevalence of menopausal symptoms is 87.7%. Many studies have focused on hormone replacement therapy but due to its adverse effect on health, interest has shifted to alternative methods that are non-pharmacological therapies like healthy lifestyles. The association of dietary intake with menopausal symptoms has hardly been studied, there are very few studies related to this topic. Some studies have investigated that certain food items, nutrients, or supplements are beneficial to prevent certain symptoms instead of the whole diet.

Phytoestrogens are plant compounds that have been shown to improve symptoms in menopause. Ahsan et al. (2017) conducted a study, in which symptoms of menopause were measured after consumption of soybean for 12 weeks. The study results showed the benefits of soybean on hot flashes in the perimenopausal stage. But it did not affect the urogenital symptoms.

A carbohydrate quality index study showed a higher intake of fiber, solid carbohydrates, and low GI foods are associated with a lower psychological symptoms and somatic symptom score. An observational study in postmenopausal women identified that a higher intake of refined cereals is adversely associated with the incidence of depression and stress and hot flashes. (Mohsenian et al., 2021).Carbohydrate foods such as fiber-rich, whole grains, and low glycemic index food have shown to be beneficial. Fiber-rich, whole grains, and low GI food have been shown to reduce total body fat mass and manage weight (Silva et al., 2021). Psyllium fiber has been shown to decrease serum cholesterol levels in postmenopausal women, this helps in lowering the risk of cardiovascular diseases (Silva et al., 2021).

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Almonds, walnuts, flaxseeds, sunflower seeds, sesame seeds, and sunflower seeds are considered good fats which help in lowering the total cholesterol and lipids in the body. This results in a decrease in body fat and lowers the hot flashes as obese women show more severe symptoms of hot flashes (Noll et al., 2020). Wu et al. (2013) in a study showed that a low-fat diet lowers the concentration of total cholesterol and low-density lipoprotein cholesterol in postmenopausal women. A low-fat diet results in weight loss. A study shows that women who have lost weight were showing fewer vasomotor symptoms. (Kroenke et al., 2012). Women consuming a diet high in trans-fat, saturated fats, and processed food showed higher intensity of menopausal symptoms (Noll et al., 2020). According to a study, higher protein intake is associated with higher Lean Body Mass in menopausal women. Aging increases dietary protein requirements because the capacity of skeletal muscles to activate protein synthesis is reduced. (Silva et al., 2017). In the Women's Health Initiative study, higher protein intake (1.2 g/kg body weight) is associated with a 32% lower risk of weakness, tiredness, and better physical function. (Beasley et al., 2010).

Consumption of fruits and vegetables is associated with alleviating hot flashes. Fruits mainly citrus fruits, and vegetables (mainly green leafy and yellow, orange coloured) helps in decreasing the severity of hotflashes (Beezhold et al., 2018). Higher intake of plant-based food is negatively associated with depression. Soleymani et al. (2012) found that a diet including fruits and vegetables was inversely associated with psychological and physical symptoms. Adequate intake of fruits and vegetables and mainly citrus foods and beta carotene rich vegetables are highly associated with lowering the depression in the menopausal women. In a study it has been evidenced that tomato helps in lowering the psychological symptoms. This function of vitamin is due to the high lycopene in the tomato which is high in antioxidants. Antioxidant helps in relieving stress and thus the depression and anxiety. It has also shown that cruciferous vegetables cabbage and cauliflower increase the incidence of depression in the menopausal women (Safabakhsh et al., 2020)

Alcohol consumption and tobacco smoking are associated with early menopause. Early menopause increases the risk of osteoporosis. Alcohol and smoking also contribute in weight gain, therefore, increasing the risk of obesity and obesity-related diseases (Mikkelsen et al., 2015). Junk food and packaged foods contains too much of refined cereals, salt and saturated fats. Intake of packaged food, junk food, and carbonated beverages is highly associated with increased weight gain. Too much consumption of this leads to bad quality of life (Górna, et al., 2019)

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Sleep disturbances are very common and prevalent in menopausal transition. It impacts the quality of life, productivity of work and have long term effect on heath. Hot flashes are one of the reasons for difficulty in falling asleep and staying asleep. Sleep disturbances and hot flashes are interrelated with each other. Due to hot flashes, woman experiences difficulty in sleeping. Less sleep in the night can cause fatigue, women may feel tired very easily.

Risk of depression increases in the menopausal transition. There is a bi- directional relation between sleep and cognitive function also. Poor sleep can affect the cognitive function like depressed mood, irritability, difficulty in concentrating and poor memory. (Baker et al., 2018).Sleep hours do not affect the urogenital symptoms. There are no studies which show these findings. Sleep apnea and disturbances are associated with severe joint pain in post-menopausal women. Musculoskeletal pain in menopause is very common and cause un easiness. Sleep can increase the severity of this pain (Odai et al., 2020)

V. CONCLUSION:

Dietary carbohydrates rich in fibre, whole grains, and low GI foods showed a negative correlation with hot flashes and weight gain. Refined cereals, high GI showed positive correlations with hot flashes and weight gain. Dietary phytoestrogens are negatively correlated with hot flashes. Dietary fats such as nuts and oil seeds show negative correlation with hot flashes and weight gain. Saturated, fats, trans fats and fried foods show negative correlation with hot flashes and weight gain. Packaged food, junk foods, carbonated beverages, alcohol consumption and a smoking show positive correlation with hot flashes, depression and weight gain. Fruits mainly citrus fruits and vegetables mainly green leafy, yellow orange colored show negative correlation with the psychological symptom and that with urogenital symptom show positive correlation. Consumption of tomato, is associated with lowering of the psychological symptoms.

This survey concluded that nutrient intake, dietary pattern, and a healthy lifestyle may contribute in lowering the severity of menopausal symptoms. And also, some food can alleviate the symptoms more. A diet rich in whole grains, fiber, fruits, and vegetables and less refined cereals, and saturated fats helps in lowering and preventing the severity of menopausal symptoms. In addition to that sleep cycle and physical activity may also help in lowering the menopausal symptoms. Future applications of the survey are to spread awareness about the importance of nutrient intake, dietary patterns, sleep cycle, and exercise in menopausal

women. This survey can be done in a particular community in order to study the dietary patterns of a particular community and its impact on the symptoms.

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