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**MEMORY FUNCTIONS AND DEPRESSION IN POSTMENOPAUSAL AND PREMENOPAUSAL WOMEN**


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# ABSTRACT

## Memory Functions and Depression in Postmenopausal and Premenopausal Women

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The aim of this study is to compare the level of depression and memory functions of premenopausal and postmenopausal women. The sample of the study consists of 50 postmenopausal and 50 premenopausal. 100 women aged between 40-55 years old. Socio-Demographic Information Form, Auditory Verbal Learning Test (AVLT), Beck Depression Inventory (BDI) and Menopausal Symptom Rating Scale (MSDS) were used as data collection tools.

According to the results of the research, short-term recall and long-term recall scores of menopausal women were found significantly lower than women who did not enter menopause. According to the results of the BDI, women who entered menopause had higher scores of depression than those who did not, however it was not statistically significant. Regression analysis was applied to identify each of the short-term recall (A5) and long-term recall (A7) subscale scores of the RAVLT scale. In the findings obtained from the study, it was determined that the variable that predicted the instant recall score was the age and the long-term recall score was the menopausal status.

*Keywords: Menopause, Memory, Depression, Neuropsychological tests.*

# ÖZ

## Menopozda Olan ve Olmayan Kadınların Bellek İşlevleri ve Depresyonla İlişkisi

Gizem Barutçu,

Haziran, 2017

Bu çalışmanın amacı menopozda olan ve olmayan kadınların bellek işlevleri ve depresyon düzeylerini karşılaştırmaktır. Araştırmaya 40-55 yaş arasındaki 50 menopozda olan ve 50 menopozda olmayan 100 kadın katılmıştır. Veri toplama aracı olarak, Demografik Bilgi Formu, İşitsel Sözel Öğrenme Testi (Auditory Verbal Learning Test: AVLT), Beck Depresyon Envanteri (BDÖ) ve Menopoz Semptomlarını Değerlendirme Ölçeği (MSDÖ) uygulanmıştır.

Araştırmanın sonucuna göre, menopozda olan kadınların kısa süreli anlık hatırlama ve uzun süreli hatırlama puanları menopoza girmeyen kadınlara göre anlamlı derecede daha düşük bulunmuştur. BDÖ sonuçlarına göre menopoza giren kadınların, girmeyenlere göre depresyon puanlarının daha yüksek olduğu bulunmuştur fakat istatistiksel açıdan anlamlı fark bulunmamıştır. RAVLT ölçeğinin kısa süreli anlık hatırlama (A5) ve uzun süreli hatırlama (A7) alt ölçek puanlarının her birini anlamak için regresyon analizi uygulanmıştır. Araştırmadan elde edilen bulgularda, anlık hatırlama puanını en çok yordayan değişkenin yaş olduğu, uzun süreli hatırlama puanının ise menopozal statü olduğu belirlenmiştir.

***Anahtar Kelimeler:*** *Menopoz, Bellek, Depresyon, Nöropsikolojik testler.*

# ACKNOWLEDGEMENTS

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# ABBREVIATIONS

**AVLT:** Auditory Verbal Learning Test

**ANOVA:** Analysis of variance

**BDI:** Beck depression inventory

**DSM:** Diagnostic and statistical manual of mental disorders

**fMRI:** Functional magnetic resonance imaging

**MDD:** Major depressive disorder

**MRS:** Menopause rating scale

**SWAN:** Study of women health across the nation

**VMPT:** Verbal Memory Processes Test

**BVMT:** Benton Visual Memory Test

**MMT:** Mini Mental Test

**CT:** Cancellation Test

**CTT**: Colour Trails Test

**VFT:** Verbal Fluency Test

**SPSS:** Statistical Package for Social Sciences

# 1. INTRODUCTION

Menopause is the period when menstruation stops completely, marked by the end of ovarian function and hormonal changes. The average age of menopause in Turkey is 46.5 (Bezircioğlu et al., 2004, p.200). The fact that the average age is so early indicates that women have a significant portion of their lives in menopause. Menopause is a normal physiological period, however it brings many changes to the lives of women. Menopausal transition is usually accompanied by a range of physical, emotional and cognitive symptoms such as memory complaints, sleep and mood changes, vasomotor symptoms (hot flashes, night sweats) and urinary problems. Menopause occurs as a result of hormonal changes and reduced oestrogen production. In the menopausal period, a decrease in oestrogen hormone is thought to be associated with a decrease in cognitive function and an increased risk of depressive symptoms, however it is not clear whether these symptoms are associated with hormone changes in menopausal transition. Therefore, menopause is the best time to understand whether hormones are linked to depression and memory functions. A gradual decline in some cognitive functions may occur with normal aging, however the information about the fact that oestrogen hormone protects cognitive aging and verbal memory in women who do not enter menopause is controversial. Women who enter menopause are expected to have a significant increase in cognitive function changes, especially in verbal memory impairment and depression due to hormonal changes.

## 1.1. Menopause

The word menopause is based on the words menos (month) and pausos (last) in Greek. Menopause is defined as permanent ending of menstrual bleeding due to functional loss of ovary. Menopause is the termination of the ovarian function and the permanent termination of the resulting menstruation. Bezircioğlu et al., (2004) mention that no menstrual bleeding should occur for one year after the last menstrual bleeding, regardless of other pathological reasons, in order to be able to diagnose menopause. The effects of reproduction and aging, as well as beliefs about the termination of menstruation, have been influenced by menopause as a period of decline both physically and mentally. (Görgel and Çakıroğlu, 2004, p.6). Menopause is influenced by many factors such as age, geographical, genetic, genital, psychic, physical, environmental, smoking, social factors and general health status. Women go through five periods as childhood, adolescence, sexual maturity, menopause and old age. In each of these periods, different physical, psychic and hormonal differences are seen. Although each period has its own characteristics, menopause is an important period with its effects on women's life (Özcan and Oskay, 2013, p.157). Women spend a significant part of their lives in the postmenopausal period. Age of entering menopause appears between the ages of 45-55, varying between countries and societies. It is stated that, the average age of women entering menopause in Turkey is 46.5. (Bezircioglu et al., 2004).

Menopause occurs in two ways in terms of its form;

1) Natural Menopause: It is a physiological condition which is caused by cutting of menstrual blebs for at least one year with no pathological cause.

2) Surgical Menopause: Menopause is not only a natural process in women's life, but they also enter menopause surgically. The menstrual cycle is realized by the functioning of a complex feedback system of the hypothalamus, pituitary and ovarian hormones.

A large proportion of women enter the menopause process surgically either because of the removal of both ovaries or because ovarian functions are exposed to iatrogenic (diseases resulting from medical practices) such as chemotherapy or radiotherapy. (Nelson et al., 2005, p. 10).

The age of onset occurs in three ways;

1) Early menopause: Going through the menopause under the age of 40 is called early menopause. Although there is no definite conclusion about the cause of early menopause, it is thought to be genetic. Early menopause results from excess radiation exposure, environmental factors, birth-related negative factors (abortions, frequent pregnancy, abortion, miscarriage interventions) and situations like obesity.

2) Normal menopause: The occurrence of normal menopause is seen between the ages of 45-54.

3) Late menopause: It is called late menopause when a woman is over 55 and did not enter menopause. Genetic structure, familial and environmental factors influence this situation (Sözer, 2014, p.4).

### 1.1.1. Klimakterium

The Klimakterium word stands for the Greek staircase. Climacterium, also called climacteric, is a period of hormone production and reproductive efficiency after a woman's sexual activity period and begins at about the age 45 and lasts for an average of 20 years. Climacteric and menopausal words are often confused. Klimakterium is a phase which extends to old age after women's last period (Intepe, 2007, p.12).

This process, defined as Climacteric Period, is classified according to World Health Organization classification such as: premenopause, menopause, perimenopause and postmenopausal periods.

Premenopause: Premenopausal term is often used for a period of two years just before menopause or for the productive period. It is a process from the first symptom of the climacterium to menopause. During this period, the ovaries gradually lose their old working power. It starts approximately around 40 years of age and usually manifests itself as irregular menstrual bleeding as the first symptoms (Görgel and Çakıroğlu, 2004, p.4).

Perimenopause: It is a transition period to menopause and involves the period before menopause and first year after it. The most common problems in this period of intense affection are psychosomatic symptoms such as hot flashes, night sweats, tiredness, restlessness, forgetfulness and headache. This period shows that the reproductive period has come to an end. (Çelik and Pasinoğlu, 2013 p.50).

Postmenopause: Postmenopause is the period from menopausal to old age. It is defined as the period after the last menstrual bleeding and on the other hand defined as a process that starts with menopause and continues until age 65 (Görgel and Çakıroğlu, 2004, p.4).

**1.1.2. Menopause Symptoms**

**1.1.2.1. Irregular Periods**

The most obvious symptom of menopause is menstrual irregularities. Irregular or intense menstrual bleeding, changes in hormone levels are symptoms seen in women in the perimenopausal stage. In this period, menstrual bleeding usually manifests itself as long periods or short periods, over and long periods or menstrual periods. (Duç, 2014, p.14).

**1.1.2.2. Physical Change**

Physical changes are seen as suddenly feeling hot. It usually starts from the neck and appears as redness in the upper parts of the chest and towards the head from the face. Signs of warming are seen together with redness.

Excessive sweating is occurring in places where hot flashes occur. It ranges from 3 to 12 a day and can last from a few seconds to a few minutes. This usually occurs at night and can be intense enough to wake one up from sleep. It also reveals such symptoms as sleep problems, dermatological (vaginal dryness), digestive system, increased appetite, changes in musculoskeletal system (osteoporosis, calcium and protein in the bones), cardiovascular system changes (Görgel and Çakıroğlu, 2004, p. 6)

Osteolysis, seen in postmenopausal women, reveals physiological indications such as thinning in the hair follicles, increase in the percentage of feathers, changes in the breast filling and flexibility, and weight gain (Duç, 2014, p.14).

### 1.1.2.3. Emotional Changes

Emotional changes in menopause reveal some symptoms such as; anger, restlessness, tension, nervousness, weakness, reluctance, crying attacks, easily influenced by life events, character changes and withdrawal from society (Görgel and Çakıroğlu, 2004, p. 6). Duç (2014), mention that in the menopause period, there is usually insufficient evidence for the direct effect of menopause of depression symptoms. It is argued that the severity of menopausal symptoms leads to psychological problems however, it is being investigated that these psychological changes may occur due to middle age.

### 1.1.2.4. Cognitive Changes

It has been suggested that loss of estrogen plays an important role in cognitive aging because the brain is an important target organ for oestrogen action.

In cognitive changes, symptoms such as decrease in memory related functions, forgetfulness, inability to collect attention, wrong decision making or inadequacy and not being able to think fast can occur. During menopause, forgetfulness, distractibility and difficulty in solving problems are accepted as normal symptoms (Duç, 2014, p. 14).

The data also show that oestrogen deficiency is associated with an increased risk of Alzheimer's disease (Samsioe, 1996, p. 10).

## 1.2. Depression

Depression is known to be a multifaceted mental health problem that causes many fields of and symptoms, such as cognitive, perceptual, sensory, and psychomotor. Many people who are diagnosed with depression report that they have lost their interest of everything in their lives. Significant features of depression are summarized as sadness, grief, self-blame and humiliation, feelings of reluctance, distinct changes in appetite and sleep levels, sexual reluctance, self-punishment or suicidal thoughts, avoidance of social relations, and significant energy loss. (Hoeksema, 2011, p. 181).

In the Diagnostic and Statistical Manual of Mental Disorders, the fifth edition, DSM-V-TR, under the tittle of depressive disorders, there are disruptive mood disorder, depression of pre-menstrual dysphoria, impaired depression due to substance / drug, depression due to another health condition, another defined depression disorder, and undefined depression. Postmenopausal depression was classified as a separate category under the name of "involutional melancholy" in DSM-II, however it was excluded from subsequent classification systems due to the lack of a full consensus on it.

In order to cover the diagnostic criteria for a major depression disorder (MDD) according to DSM-V-TR, (A) during the two-week period, five or more of the following symptoms should be seen. (1) It must be a mood of emotions that is manifested almost daily by the person himself which last the whole day, and this situation must be understood by the others. (2) The person who does not take pleasure or be reluctant to activities. (3) To lose extreme weight or gain unintentionally, eating lots of food or not having the desire to eat at all. (4) Significant changes in the sleep pattern of a person (sleeping too much or insomnia). (5) Agitation or significant slow-down in person.

(6) Significant energy loss seen in a person. (7) Feeling oneself worthless and guilty (can be delusional). (8) The instability of the person, excessive distraction, lack of focus at a certain point. (9) Refresher suicidal thoughts in person and suicide attempts are seen. (B) It is necessary to cause clinically apparent impairment or decrease in social aspect and a significant portion of the person's functional areas. (C) These diagnostic criterias are not linked to a physiological condition. (A and C diagnostic criterias lead to severe depression). (D) The period of MDD is not linked to schizophrenia, schizophreniform, schizoaffective disorder, delusional disorder, or other defined or unspecified disorders leading to psychosis. (E) Mania and hypomania periods are not seen (Köroğlu, 2006 p. 191).

Depression is an important mental illness that is related to mood, memory and thought (cognitive) or leads to behavioral and bodily differences. Depression is a common and treatable disease in the world. Depression is different from the case of sadness and hopelessness. Depression should last at least two weeks and be long-term. Person's necessary function of everyday life should fail. Depression is a medical illness and is usually a biological disease related with psychological and social distress. Depression plays a role in the development of the brain and body.

People with depression are said to have falling in the chemicals in the brain that regulate mood, sleep, appetite, and other functions, and that there is a decrease in the function of these cells. Depression is also the result of hormonal changes. Hormones are important in the metabolism of the body as well as in the behavior of the person, in their thinking and in the change of their emotions.

In women's monthly menstrual periods, when giving birth or entering menopause, there is a change in the levels of oestrogen and progesterone hormones in women and this hormonal change leads to depression (Köroğlu, 2013, p. 35).

### 1.3.Cognitive Functions and Memory

According to the definition of 'cognitive' (Karakaş et al., 2000, p. 216), processing of the entrance in sensory organs are the functions for the perception and understanding of the world. Solving cognitive processes in psychology is understood through the observation of behaviors from the outside. In this case, neuropsychology provides a solution to measure the relationship between cognitive processes and behaviors. Neuropsychology reveals the reliability and validity of this relationship with the aid of established neuropsychological tests. The neuropsychological evaluation and the results are obtained through neuropsychological tests and scales. (Mollahasanoğlu, 2002, p.4). In order for a living creature to survive, it is necessary to adapt to its environment, to sense the stimulus, to perceive it as meaningful totals, to keep in memory (long-term memory and short-term memory) and associations. Memory can be defined as the ability to record, store, and retrieve information at any time. Memory can generally be examined in three parts. Atkinson and Shiffrin (1968) identified the dual storage model of memory as the first component of sensory memory. Although the capacity of sensory memory is very wide, the duration of information is very short. However, with the process of attention and perception, some of this information is taken and sent to short-term memory. The stimuli that the individual feels with the five sensory organs are recorded in this section. Recorded information is kept for a very short time or is coded and transferred to long-term memory. Short term memory is the part of thinking and processing. If the information in short-term memory is not seen important or if they are not repeated frequently enough, they can be forgotten or it can be transferred to the long-term memory if it is repeated and coded. The role of the individual in the process of repetition is important. Long term memory is a type of memory that the information can be stored for many years.

It is the part that stores the information for a long time, especially well-learned one in the model of information processing. In long-term memory, we store the information in the length and amount we want and do not forget them. Information in long-term memory is not lost, but if the information is not properly coded and placed in the suitable place, it is difficult to recall. (Ormrod, 2012, p.160). All of these are cognitive processes that take place in the human mind.

Memory processes are profoundly influential in information processing mental health integrity, environmental compliance, and identity perception (Can et al., 2015, p. 2). While disturbances in memory processes are associated with some diseases at the primary level, memory impairment develops secondarily in some psychological and physical illnesses. Apart from these reasons, memory distortions also arise from aging.

Menopausal symptoms can also cause memory problems. Insomnia and fatigue can reduce ability to think. Sometimes experiencing physical changes or emotional confusion related to menopause, and stress can affect mental performance. In the case of hormonal changes, there is a great deal of evidence showing that oestrogen affects brain chemistry and structure, which is important for memory, and loss of oestrogen associated with menopause is presumably responsible for the memory. Scientists have pointed out that oestrogen is needed for nerve conduction to certain areas of the brain. However, some controlled studies have shown that the use of oestrogen in women increases the short- and long-term memory and increases the learning capacity of new materials in menopause.

A summary of ten studies of the use of postmenopausal oestrogen's published in the American Medical Association Journal suggests that women who take oestrogen therapy have a 29 percent lower risk of developing dementia than those who can not use additional oestrogen. Studies have also found that oestrogen use constitute lower risk in Alzheimer's disease (Beck, 2000, p. 42).

A memory test is used to print out the results obtained for oestrogen and cognitive clinical trials. Often the word list consists of tasks involving learning, recall, and delayed recall. Focusing on verbal memory is related to the risk of dementia. In addition, women perform better in these tasks than men, however women are complaining about memory weakness and forgetfulness in names and other verbal informations during perimenopause. According to new evidence from the Study of Women Health Across the Nation (SWAN), women show performance deficits in verbal tests in the perimenopausal period (Greendale et al., 2009).

### 1.4.Literature Review

A general assumption is that memory problems are related to menopausal symptoms and menopausal symptoms are related to cognitive performance. Most women complain of changes in cognitive function during menopause transition. Often they say that their memory is getting worse. (Santoro, Epperson and Mathews, 2015). Failure to gather attention and forgetfulness are the most common symptom of mental functioning. In perimenopause, most difficulties arise from forgetfulness, distraction and problem solving (Duç, 2014, p. 14).

It is known that sex hormones and cognitive functions are related to each other by researches made till now. The menstrual cycle provides a good opportunity to study oestrogen changes. It has been found that, women in menstruating period, are better at verbal flexibility, perceptual speed and hand performance, however they perform worse during spatial perception periods in comparison to the terms when hormones were lower (Poromaa and Gingnell, 2014, p. 2).

Studies involving the effects of estrogen on cognitive functions include hormonal changes in postmenopausal women and the cognitive effects of hormone replacement therapy (HRT) on women.

According to the studies conducted, HRT was found to be effective in cognitive processes related to verbal skills, but not in other cognitive processes. Looking at other studies it was found that HRT has a positive effect regarding visual memory (Greendale, et al., 2010).

In another study, women in the postmenopausal period were found to have a significant difference in the 6th and 12th months of the Word Recall Test (tested for 6 months) according to the first measurement. There was no difference between the test results of women who did and did not receive HRT. A decrease in oestrogen (as in postmenopausal) or significant fluctuations in oestrogen (such as in perimenopause) is thought to be detrimental to brain function (Kurt, Bekçi and Karakaş, 2004, p. 6).

In another study, participants age range is 45-57. At the basis of the cognitive work, 181 women in the sample consist of premenopausal, 1,165 early perimenopausal, 278 late perimenopausal, 643 postmenopausal hormone-free and 95 hormone-using 2,362 postmenopausal women. The study dealt with cognitive processing speed, verbal episodic memory and working memory. During the period of perimenopause, the cognitive performance of women decreased and it was found that women did not learn as much as they had during the premenopausal period. The perceived memory problems of women with perimenopausal transition have been associated with perceived cognitive decline and are not as well studied by women as premenopausal. (Greendale et al., 2009).

In a study involving the relationship between menopausal stage and neuropsychological performance and depression, four longitudinal studies and four cross-sectional studies on menopausal transition and cognitive functions and the risk of menopausal transition and depression were used. Postmenopausal women had significantly worse results in verbal memory and verbal fluency tasks than premenopausal and perimenopausal women.

Menopausal transition, however, has been reported to be a time of increased depressive symptoms against cognitive decline and increased risk of depressive disorders. (Weber, Maki and Dermott, 2014).

In another study conducted in Finland, researchers examined 70 women aged 47-65 and found that the results of most of the mental performance tests correlate with age. Older women are slower and made more mistakes than younger women. When these women were given oestrogen replacement therapy (short-term use) for three months, their cognitive abilities did not improve. It made people think that, a mild memory loss is a natural part of aging (Beck, 2000, p. 41).

Mitchell and Woods (2011), 1. In the women's health study in Seattle, menopausal symptoms (hot pressures, anxiety, depressive mood) have been reported to have an effect on cognitive performance.

Similarly, in a survey conducted to assess postmenopausal attitudes toward menopause with 88 Italian women, it is reported that 70% of participants have decline in memory (Betti et al., 2001, p. 331).

The results showed that peri and postmenopausal women were three times more likely to have memory problems than premenopausal women in an additional survey using a sample from 151 faculty members aged 30-60 years (Devi, et al., 2005, p. 225).

In another study, a sample of 120 Australian women between 45 and 60 years of age were assessed for complaints of cognitive performance and memory. 82 percent of the women in the sample reported memory complaints. Peri and postmenopausal women were significantly more likely to have memory complaints than premenopausal women (Schaafsma, Homewood and Taylor, 2010, p. 86).

In a study conducted by Hashemi and Asgari (2016) in Iran, a study consisting of women who did not enter the menopause in the age range of 20-40 years and women who entered the menopause between the ages of 45-65 were grouped. In conclusion, it has been found that there is a significant decrease in the direction of neuropsychological functions of the postmenopausal women comparing to ones who have not entered menopause.

According to the study made by Santoro et al. (2015) which was conducted on 205 women with menopause, it has been reported that there is 72% memory disorder.

Symptoms are more likely related to the stress perceived as perimenopausal phase or depressive symptoms; however, generally cognitive symptoms are more frequently seen in the early period of menopausal transition. Although the cognitive complaints in women with menopause are more prevalent, it should be discussed whether there is an objective decrease in the cognition or anything related with normal aging. In a longitudinal study in which cognitive and behavioural evaluations have been held on 403 women passing through premenopose to postmenopose in order to determine whether aging regarding fertility is related to an independent decrease from the age in verbal memory, some cognitive domains have been found to be sensitive to physiological changes independent of age (Epperson, Sammel and Freeman, 2013).

Meyer et al. (2003) in the study made in Chicago, they claimed that there will be a regression at the transitional period of menopause in women's cognition. 5-year-long longitudinal study is composed of randomly chosen and ranging in age from 52 to 55. In the study which includes 803 women not using hormones, cognitive evaluations were made.

Researchers evaluated working memory, perceiving speed and in contrast to the hypothesis, during premenopausal and perimenopausal periods, they found little but significant increase building up over time; furthermore, transitional period of menopause could not go with the decrease in working memory and perceiving speed. This tendency could not be explained through chronological age, education, family income ethnic background or self-perceived health issues.

In a double-blind study, randomly chosen 52 women were given 0.05 mmg oestradiol (a kind of oestrogen) or placebo transdermal band for 12 weeks. They tested memory, learning and executive functions of the women, at the beginning and at the end of the study they made evaluations about the hot flashes and sleeping. Non-depressive perimenopausal and postmenopausal women were studied. Most of them experienced the hot flashes problem and sleeping disorders. When oestrogen therapy was compared to the placebo, during verbal recall which is frontal system mediated, it reduced perseveration defects; however, it did not affect the other cognitive processes. At first, it becomes evident that the oestrogen therapy is more useful in terms of cognition for the women with hot flashes. It has been found out that it is not useful for cognition besides it is not related to sleeping problems. During the verbal and spatial working memory tests, there has been some significant increases in frontal system activity with oestrogen therapy given at the time of functional magnetic resonance imaging (fMRI). Oestrogen therapy developed perseverative errors decreasing at the time of verbal recall activities, prefrontal cortex activation and executive functionality. It has also been found out that oestrogen therapy and cognitive recovery is associated with hot flashes (Joffe et al., 2006, p. 412).

Period of menopause causes many different changes over women due to the hormones. As well as hormones, the ideas of reaching the end of the youth and fertility for women, as menopausal period begins, causes some psychological problems.

Another cause of the depression is thought to be the reason for the loss of fertility and feminity according to a psychoanalytical view. Freud relates the mourning and melancholy after the end of the fertility (Sözer, 2014, p.16).

According to a review study, Anita, et al. (2016) aimed to examine perimenopausal and postmenopausal risk for depression, to find out the importance and reason of scanning MDD, to go through the treatment options for MDD with perimenopausal and postmenopausal women. In order to evaluate the risk between transitional period of menopause and mood disorders and develop some suggestions for MDD scan and managing, 22 cross-sectional and longitudinal studies were used. According to the data acquired, perimenopausal period entail a high risk; risk seems to increase from the early period to the late of perimenopause and decrease in the period of postmenopause. In addition to this, the women with depression stories are more likely to be diagnosed MDD 5 times more in this period.

There is a huge effect of sex hormones over the mood of women. Oestrogen hormone makes big differences in women's memory, cognitive processes and learning. This difference is mostly because of the progsterone hormone. This hormone has a big role in affecting the mood of the women by neuropinefrin, serotonin, dopamine and acetylcholine. It can be found a lot of studies about depression and menopauses. The reason is that menopause causes bad effects on women's mental health. The reason why there are a lot of studies about this topic is depression which is a disorder encountered mostly on having negative effects over women.

With reference to the results of the studies related to the frequency and prevalence of depression, it has been found that having depression is two times more common for women than men. Beginning with early adulthood, it becomes more evident at the age of 35-45 and it continues in senescent period (Şireli, 2012).

The period of menopause gets longer with the increase of old-age population and the period of menopause and also psychological problems become more important. It was seen that menopause caused psychological symptoms and the increase of depressive symptoms (Ağıl, 2010).

In the study Akpınar (2006) conducted, anxiousness, depression, crying, tension, loss of apettite besides decrease in mental capacity, loss of memory and concentration were discussed. He also indicated that depression is seen more significantly in postmenopausal period than premenopausal period. It is stated that depression comes out as a result of decreasing in oestrogen level of women in the perimenopausal period. This is because oestrogen interacts with brain chemicals thus mood gets affected.

In the study conducted by Demir, et al. (2000) the effect of depression on cognitive functions were considered. 25 patients suffering from depression (15 women 10 men) and 25 healthy participants standing as a control group were used for the research. Verbal Memory Processes Test (VMPT), Benton Visual Memory Test (BVMT), Mini Mental Test (MMT), Cancellation Test (CT), Colour Trails Test (CTT), and Verbal Fluency Test (VFT) were conducted on both groups. As a result of this study, visual memory, visual-motor monitoring, focused attention and verbal fluency disorders were determined. These disorders seemed to be increasing depending on the level of depression.

Bezircioğlu, et al (2004) claimed that the women after the period of menopause seem to have higher level of depression symptoms than the women menstruating before the period of menopause. Furthermore, any significant difference between women using hormones and not using hormones could not be detected. In a meta-analysis study conducted by Kruif et al. (2016), any significant difference between perimenopause and premenopause could not be found. It is found out that women in the period of perimenopause seem to have higher level of depressive symptoms.

However, there were some studies including women having depression histories are significantly higher level of depressive symptoms than women not having depression stories in the transitional period of menopause. In a longitudinal study conducted in Boston including 460 premenopausal women not having MDD lifelong ranging in age from 36-45 it is found that women develop significant depressive symptoms in the period of perimenopause. It shows that women with more vasomotor symptoms have two times higher level of depressive symptoms. Another longitudinal study (8 years) conducted in Philadelphia provides evidence for increasing the possibility of 436 women not having depression stories being more likely to have depressive symptoms in the transitional period of menopause than before the period of menopause (Cohen, et al. 2006; Freeman, et al. 2006; Kahn et al., 2001). The problems with the depression are known to start for women at the age of pre- or mid-twenties. Even if the outbreak of depression is not a usual situation, some women become depressive for the first time in perimenopause (Kahn et al., 2001).

In some of the studies, it has been found that the transitional period from premenopause and perimenopause cause depressive symptoms to increase and the risk of depression begins to decrease (Freeman et al., 2004; Maartens, Knottnerus & Pop, 2002).

## 1.5. Aim of the Study

The aim of the study this to compare the level of depression and memory functions of premenopausal and postmenopausal women.

## 1.6. Significance of the Study

Studies in literature are mostly about the effect of the cognitive processes of the women who have menopause and take HRT. HRT could increase the level of oestrogen; however, there could be an increase in the risk of breast cancer and cardiovascular disease for some women.

Therefore, there is a need for studies about examining women's cognitive processes and the level of depression without HRT, in order to explain the state of cognitive regression which is seen in a large number of women.

**1.7. Hypothesis and Research Question**

The research question is "Is there any difference in memory functioning and depression level of the women having menopause and not having menopause?"

When the women with menopause and without menopause were compared, women having menopause are to have higher scores of depression and lower scores of memory. Besides, "Is there any connection between depression level and memory functions?" As depression increases, memory functions are supposed to be impaired.

## 2. MATERIALS AND METHODS

In this section, the information including the model of the research, the study universe, the sample, the data collection tools, the distribution of the data collection tools, the collection and how to analyze the data are given.

### 2.1. Study Model

Current study utilizes descriptive survey model. It is cross-sectional study.

### 2.2. Sampling

The sample of the study consists of 100 women living in The Turkish Republic of Northern Cyprus and aged between 40 and 55 years old. The sample were grouped into two where the first group consists of 50 women who did not enter menopause yet (premenopausal group), while the second group has 50 women who entered menopause (postmenopausal group). Purposive sampling was used.

### 2.3. Survey Form

The Personal Information Form contained personal information on demographic characteristics such as age, educational status and marital status of women. In the study, three scales were used. The first scale, Menopausal Symptom Rating Scale was used to assess menopausal symptoms in women who are menopausal. The second scale, the Auditory Verbal Learning Test, which measures verbal learning and memory in both menopausal women and non-menopausal women, was applied. Thirdly, the Beck Depression Scale was used to determine the depressive levels and severity of menopausal and non menopausal women.

### 2.3.1. Socio-Demographical Information Form

This section of the survey form was developed by the researcher and it gathers the information regarding the following variables: age, level of education, employment status, profession, marital status, parenthood status, number of children, known physical and psychological health conditions.

### 2.3.2. Beck Depression Inventory (BDI)

BDI which is used in the study to compare the depression level of two menopausal groups: pre and post, is a 21 item self-report inventory originally developed by Beck, et al., (1961) and adapted to Turkish culture by Hisli (1989). The inventory measures characteristic attitudes and symptoms of depression the person has felt during the past week (7 days). There are four answer options for each question with a highest score of three and a lowest score of zero. Higher scores indicate higher level of depression.

The reliability study of Turkish version of the BDI was conducted by applying the BDI on 259 university students and Cronbach alpha reliability coefficient was reported as .80 (Hisli, 1989). The Cronbach alpha in the present study is calculated to be .813 (Savaşır ve Şahin, 1997, p.36).

### 2.3.3. Rey Auditory Verbal Learning Test (RAVLT)

This learning test was developed by Rey in 1964 and based on learning a list of words. It is one of the most commonly used neuropsychological tests of verbal learning and memory. The test aims to evaluate the rates of verbal learning and memory, proactive and retroactive inhibition, retention, recognition ability, encoding, retrieval and subjective organization. It focusses on short term memory especially during the first 15-20 minutes. After first 20 minutes, it aims to evaluate the long-term memory qualities.

RAVLT consists of a list of 15 words (A list) and scores are given as the participants remembers those words correctly. The list is read for a total of five times and in each repeat, words are read for one complete second. At the end of each trial, the participant is asked to remember the words. The same trial is repeated for five times (A1, A2, A3, A4, A5 subscales). Afterwards, a list of new 15 words (B list) is read to the participant and they are asked to remember this new list. Just after finishing, participant is asked to repeat the A list words (A6 subscale). Approximately after 20 minutes, the participant is again asked to remember the words in the A list (A7 subscale) and this repeat aims to measure the long-term memory skills. At the last step, a new list with 50 words which are semantically and phonetically similar to the words of first two lists is given to the participant and he/she is asked to correctly classify the words as A list or B list words.

Turkish version of the test was prepared and standardized by Genç-Açıkgöz and Karakaş (1996 a,b). As in both the original form as well as in the adapted form, words were determined according to the difficulty, concreteness, length, and frequency of use.

### 2.3.4. Menopause Rating Scale (MRS)

Menopause rating questionnaire were used as a basis for assessing menopausal symptoms in this study. The scale is a self-administered questionnaire which is widely used and validated and have been used in many clinical and epidemiological studies, and in research on the etiology of menopausal symptoms to assess the severity of menopausal symptoms.

MRS was developed by Schneider and Heineman (1996). The MRS is composed of 11 items and was divided into three subscales: (a) somatic-hot flushes, heart discomfort/palpitation, sleeping problems and muscle and joint problems; (b) psychological-depressive mood, irritability, anxiety and physical and mental exhaustion and (c) urogenital-sexual problems, bladder problems and dryness of the vagina.

Each of the eleven symptoms contained a scoring scale from "O" (no complaints) to "4" (very severe symptoms). MRS was translated and adapted into Turkish by Gürkan (2005). Reliability analysis of the scale for the current study showed that the Cronbach's alpha is 0.766.

## 2.4. Statistical Analysis

All statistical analysis was performed with Statistical Package for Social Sciences (SPSS) 21.0 software.

Frequency analysis was carried out to investigate the descriptive characteristics of study sample.

For the continuous data such as BDI Score and RAVLT scores, descriptive statistics such as arithmetic mean, standard deviation, median, minimum and maximum values were calculated.

To determine the statistical hypothesis testing methods, the distribution characteristics of the scale scores were investigated in terms of normality. For this purpose, Kolmogorov-Smirnov test of normality, Shapiro-Wilk test of normality, Q-Q plots, skewness and kurtosis values were all analyzed for each group. Additionally, Levene's test of homogeneity of variances were applied where required. Using all gathered information, parametric hypothesis tests were performed throughout the whole data analysis phase.

To understand the possible associations between age and scale scores, Pearson correlation test was used.

Independent samples t test was applied for the comparison of BDI and RAVLT score between each groups.

In addition, within each menopausal group, scale scores were compared with respect to the employment status of the participants with independent samples t test.

One Way Analysis of Variance (ANOVA) test was applied for each menopausal group to understand the significance of Beck depression scale score and RAVLT score differences between three education level of participants. This was due to the dependent variable having more than two independent categories

Two Linear regression analyses was applied for understanding each of the A5 and A7 subscale scores of RAVLT scale (dependent variable) with respect to three independent variables: menopausal status, age and BDI score.

Related analysis result of each statistical method is shown in their corresponding tables throughout the text. Level of significance was accepted to be 0.05 for the whole study.

# 3. RESULTS

**Table 1. Distribution of demographic characteristics of the participants with respect to their menopausal status**

| | Entered Menopause | | Did not Enter Menopause | | Total | |
|---|---|---|---|---|---|---|
| | N | % | N | % | n | % |
| **Age Groups** | | | | | | |
| 45 and Lower | 3 | 6,00 | 30 | 60,00 | 33 | 33,00 |
| 46 to 50 | 13 | 26,00 | 18 | 36,00 | 31 | 31,00 |
| 51 and Higher | 34 | 68,00 | 2 | 4,00 | 36 | 36,00 |
| **Education** | | | | | | |
| Primary /Secondary Sch, | 13 | 26,00 | 14 | 28,00 | 27 | 27,00 |
| High School | 16 | 32,00 | 13 | 26,00 | 29 | 29,00 |
| University or Higher | 21 | 42,00 | 23 | 46,00 | 44 | 44,00 |
| **Employment** | | | | | | |
| Employed | 27 | 54,00 | 40 | 80,00 | 67 | 67,00 |
| Unemployed | 23 | 46,00 | 10 | 20,00 | 33 | 33,00 |
| **Profession** | | | | | | |
| Civil Servant | 11 | 22,00 | 17 | 34,00 | 28 | 28,00 |
| Freelance | 5 | 10,00 | 4 | 8,00 | 9 | 9,00 |
| Labourer | 6 | 12,00 | 13 | 26,00 | 19 | 19,00 |
| Retired | 11 | 22,00 | 1 | 2,00 | 12 | 12,00 |
| Housewife | 11 | 22,00 | 9 | 18,00 | 20 | 20,00 |
| Private Market | 6 | 12,00 | 6 | 12,00 | 12 | 12,00 |
| **Marital Status** | | | | | | |
| Single | 0 | 0,00 | 2 | 4,00 | 2 | 2,00 |
| Married | 42 | 84,00 | 46 | 92,00 | 88 | 88,00 |
| Divorced | 4 | 8,00 | 1 | 2,00 | 5 | 5,00 |
| Widow | 4 | 8,00 | 1 | 2,00 | 5 | 5,00 |
| **Children** | | | | | | |
| Have Children | 50 | 100,00 | 48 | 96,00 | 98 | 98,00 |
| Do not Have Children | 0 | 0,00 | 2 | 4,00 | 2 | 2,00 |
| **Physical Problem** | | | | | | |
| Absent | 47 | 94,00 | 45 | 90,00 | 92 | 92,00 |
| Present | 3 | 6,00 | 5 | 10,00 | 8 | 8,00 |
| **Psychological Problem** | | | | | | |
| Absent | 48 | 96,00 | 50 | 100,00 | 98 | 98,00 |
| Present | 2 | 4,00 | 0 | 0,00 | 2 | 2,00 |

Table 1 shows the distribution of the descriptive characteristics of study sample in both menopausal groups.

Accordingly, of the women who have entered the menopause, most frequent age group was 52 year and higher with 68.0% and 6.0% of this group was aged 45 year and lower. Also, the primary and secondary school graduates for this study group were 26.0% while high school graduates were 32.0% and the percentage of participants who had university or higher degree was 42.0%. Of these 50 women, 54.0% were employed while the remaining 46.0% were unemployed at the time of the study. Most frequent three occupations in the group was civil servants, retired and housewife with 22.0% each. 42 of them (%84.0) were married, and there was no single woman in this group. All 50 (100.0%) had children. Only 3 (6.0%) participants of this group had physical health problem while also 2 (%4.0) women were experiencing psychological health problem.

For the group of participants who did not enter menopause yet, 30 of them (60.0%) were aged 45 year and lower, 36.0% were aged between 46 to 50 years and 4.0% were aged 51 year or higher. They most frequently had university or higher degree (46.0%) and 40 of them (80.0%) were employed. The highest seen occupation for this group was civil servants (34.0%), while only one participant (2.0%) was retired. In this group, two women (4.0%) were single while majority of them were (92.0%) married. Number of women who did not have child were two (4.0%), while 96.0% of the group had children. Amongst these women, 5 (10.0%) were experiencing physical health problems. There were no participants who had psychological health problems.

**Table 2. Distribution of characteristics regarding the initiation of menopause of the participants**

|  | Frequency (n) | Percentage (%) |
|---|---|---|
| **Type of Menopause** | | |
| Natural | 42 | 84,00 |
| Surgical | 8 | 16,00 |
| **Drug Use for Menopause** | | |
| No | 46 | 92,00 |
| Yes | 4 | 8,00 |

Table 2 displays the menopause related characteristics of the 50 women who already entered their menopausal period.

As shown in Table 2, majority (84.0%) of these participants entered their menopausal period through natural progress while 8 of them (16.0%) had surgical procedure for initiating the menopause. In addition, 46 women (92.0%) did not use any drug treatment for menopause while the remaining 4 (8.0%) used medication.

**Table 3. Comparison of scale scores with respect to menopausal status**

| | Entered Menopause (n=50) | | | | Did not Enter Menopause (n=50) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | $\bar{x}$ | s | Min | Max | $\bar{x}$ | s | Min | Max | t | p |
| **BDI** | 10,68 | 4,92 | 0,00 | 25,00 | 9,40 | 7,82 | 0,00 | 34,00 | 0,98 | 0,330 |
| **RAVLT** | | | | | | | | | | |
| A5 | 10,20 | 1,71 | 7,00 | 15,00 | 11,54 | 1,80 | 8,00 | 15,00 | 3,81 | 0,000* |
| A7 | 9,30 | 2,27 | 4,00 | 15,00 | 11,04 | 1,65 | 8,00 | 15,00 | 4,38 | 0,000* |

*\*p<0,05*

Table 3 shows the BDI scores, A5 and A7 subscale scores of RAVLT in each menopausal group.

Accordingly, for the group of women who entered the menopause, BDI score had a mean of 10.68±4.92 while it was 9.40±7.82 for the group who did not enter menopause yet. The difference did not show statistical significance (p>0.05).

Two subscale scores of RAVLT were also compared between study groups. As shown in Table 3, women who entered menopause had a level of A5 score of 10.20±1.71 while for A7 their mean was 9.30±2.27. On the other hand, the group who did not enter the menopause had a mean of 11.54±1.80 for A5 and 11.04±1.65 for A7 subscale scores. Both A5 and A7 subscale scores were significantly higher in premenopausal group (p<0.05).

**Table 4. Comparison of mean scores of scales according to education level for two groups**

| | Education | Entered Menopause (n=50) | | | | Did not Enter Menopause (n=50) | | | | Dif. |
|---|---|---|---|---|---|---|---|---|---|---|
| | | $\bar{x}$ | s | f | p | $\bar{x}$ | s | f | p | |
| **BDI** | Primary/ Secondary Sch. | 11,08 | 2,87 | | | 12,93 | 10,03 | | | 1-3 |
| | High School | 12,44 | 6,25 | 2,26 | 0,115 | 13,62 | 6,04 | 9,71 | 0,000* | 2-3 |
| | University or Higher | 9,10 | 4,46 | | | 4,87 | 4,15 | | | |
| **RAVLT A5** | Primary/ Secondary Sch. | 9,54 | 1,33 | | | 10,64 | 1,65 | | | 1-3 |
| | High School | 9,94 | 1,81 | 2,65 | 0,081 | 11,38 | 1,85 | 3,56 | 0,036* | |
| | University or Higher | 10,81 | 1,72 | | | 12,17 | 1,67 | | | |
| **RAVLT A7** | Primary/ Secondary Sch. | 9,08 | 1,66 | | | 10,36 | 1,50 | | | |
| | High School | 9,19 | 2,10 | 0,18 | 0,837 | 11,00 | 1,63 | 2,10 | 0,134 | |
| | University or Higher | 9,52 | 2,75 | | | 11,48 | 1,68 | | | |

*$(p<0,05)$

Table 4 displays the scale scores in each study group with respect to their level of education. For BDI, different education levels did not have any statistical significance in the group of participants who entered menopause ($p>0.05$).

However, for the participants who did not enter their menopausal period, education levels had statistically significant difference ($p<0.05$). In premenopausal group, primary or secondary school graduates had a Beck Depression score mean of 12.93±10.02 while high school graduates had 13.62±6.04 and university or higher graduates had 4.87±4.15. Accordingly, the participants who had at least university degree were having significantly lower Beck Depression scores compared to both primary/secondary school graduates and high school graduates ($p<0.05$).

Like the BDI scores, A5 subscale of RAVLT does not have any significant difference amongst the education levels of postmenopausal group ($p>0.05$). However, A5 means in education groups of premenopausal participants were significantly different ($p<0.05$).

In premenopausal group, primary or secondary school graduates had a A5 mean of 10.64±1.65 while high school graduates had 11.38±1.85 and university or higher graduates had 12.17±1.67. Accordingly, the participants who had at least university degree were having significantly higher A5 subscale scores compared to primary/secondary school graduates ($p<0.05$).

For A7 subscale score, in each groups, education levels did not show any statistically significant differences ($p>0.05$) (Table 4).

**Table 5. Comparison of mean scores of the scales according to employment status in both groups**

| | Employment | Entered Menopause (n=50) | | | | Did not Enter Menopause (n=50) | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | $\overline{x}$ | s | t | p | $\overline{x}$ | s | t | p |
| BDI | Employed | 10,67 | 5,69 | 2,96 | 0,984 | 8,88 | 7,94 | 0,47 | 0,348 |
| | Unemployed | 10,70 | 3,96 | | | 11,50 | 7,35 | | |
| RAVLT A5 | Employed | 10,81 | 1,75 | 1,24 | 0,005* | 11,60 | 1,84 | 1,20 | 0,642 |
| | Unemployed | 9,48 | 1,38 | | | 11,30 | 1,70 | | |
| RAVLT A7 | Employed | 9,67 | 2,62 | 0,02 | 0,206 | 10,90 | 1,71 | 0,45 | 0,235 |
| | Unemployed | 8,87 | 1,74 | | | 11,60 | 1,35 | | |

*(p<0,05)*

Table 5 shows the effect of employment on scale scores in each of the study groups.

As seen in the Table 5, BDI was not effected from employment status in any of the menopausal groups ($p>0.05$). Employed participants in postmenopausal group had a mean BDI scores of 10.67±5.69 while unemployed participants had 10.70±3.96 ($p>0.05$).

For premenopausal group, employed participants had a BDI score of 8.88±7.94 while unemployed participants had 11.50±7.35, and the difference was not statistically significant ($p>0.05$).

Table 5 indicates that the A5 subscale score of RAVLT had a statistically significant difference between employment status of postmenopausal study group (p<0.05). Accordingly, employed participants had an A5 mean score of 10.81±1.75 while the unemployed participants had 9.48±1.38. This indicates that the unemployed participants had significantly lower A5 level compared to the employed participants in the postmenopausal study group (p<0.05).

For A7 subscale score of the RAVLT scale, in neither study groups, employment had a significant effect (p>0.05) (Table 5).

**Table 6. Correlation analysis between age and mean scores of the scales of both groups**

| | | Age | |
|---|---|---|---|
| | | **Entered Menopause (n=50)** | **Did not Enter Menopause (n=50)** |
| **BDI** | r | -0,248 | -0,048 |
| | p | 0,083 | 0,742 |
| **Rey AVLT A5** | r | -0,233 | -0,292 |
| | p | 0,103 | 0,040* |
| **Rey AVLT A7** | r | 0,174 | 0,091 |
| | p | 0,226 | 0,532 |

*(p<0,05)*

Table 6 displays the correlation analysis findings between age and mean scores of the scales in each group.

For the group of participants who entered their menopausal period, age did not have any statistically significant correlation with none of the BDI score, A5 of RAVLT or A7 of RAVLT (p>0.05).

On the other hand, A5 subscale score had a statistically significant negative correlation with age for premenopausal study group (r: -0.292; p<0.05).

This is a weak but significant negative correlation and indicates that younger participants tend to have higher A5 subscale scores while older ones tend to have lower scores.

In premenopausal study group neither of the BDI score or A7 subscale of RAVLT scale did not have any significant correlation with the ages of the participants (p>0.05).

**Table 7. Correlation analysis between number of children and mean scores of the scales in two group**

|  |  | Number of Children | |
|---|---|---|---|
|  |  | Entered Menopause (n=50) | Did not Enter Menopause (n=50) |
| **BDI** | r | 0,306 | 0,265 |
|  | p | 0,031* | 0,063 |
| **Rey AVLT A5** | r | -0,366 | -0,091 |
|  | p | 0,009* | 0,530 |
| **Rey AVLT A7** | r | -0,239 | -0,081 |
|  | p | 0,095 | 0,575 |

*(p<0,05)*

Table 7 displays the correlation analysis findings between number of children and scale scores in each of the study groups.

For the group of participants who did not enter their menopausal period, number of children did not have any statistically significant correlation with any of the BDI score, A5 of RAVLT or A7 of RAVLT (p>0.05).

On the other hand, both BDI score and A5 subscale score had statistically significant correlations with number of children for postmenopausal study group (p<0.05).

BDI score showed a significant positive correlation with number of children (r: 0.306; p<0.05). This is a moderate but significant positive correlation and indicates that the participants who have more children tend to have higher BDI while the ones with less children tend to have lower scores.

Also, A5 subscale score showed a significant correlation with number of children (r: -0.366; p<0.05). This is a moderate but significant negative correlation and indicates that the participants who have more children tend to have lower A5 subscale scores while the ones with less children tend to have higher scores.

In postmenopausal study group A7 subscale of RAVLT scale did not have any significant correlation with the number of children that the participants have (p>0.05) (Table 7).

**Table 8. Correlation analysis between age at menopause and scale scores in postmenopausal group**

|  |  | Age at Menopause (n=50) |
|---|---|---|
| **BDI** | r | -0,279 |
|  | p | 0,049* |
| **RAVLT A5** | r | -0,160 |
|  | p | 0,268 |
| **RAVLT A7** | r | -0,193 |
|  | p | 0,179 |
| **MRS** | r | -0,065 |
|  | p | 0,655 |

*(p<0,05)*

Table 8 focuses on the participants who entered their menopausal period and it investigates the possible associations between their ages at menopause and scale scores.

As shown in the table, BDI score has a weak but statistically significant negative correlation with age at menopause (r: -0.279; p<0.05). This indicates that the women who enter their menopause period in younger ages tend to have higher BDI scores while the participants who enters menopause at older ages would have lower scores.

However, none of the other three scale scores did have significant correlations with age at menopause (Table 8).

**Table 9. Correlation analysis between scale scores in postmenopausal group**

| | | RAVLT A5 | RAVLT A7 | MRS |
|---|---|---|---|---|
| **BDI** | r | -0,087 | -0,170 | 0,609 |
| | p | 0,550 | 0,237 | 0,000* |
| **RAVLT A5** | r | | 0,472 | -0,223 |
| | p | | 0,001* | 0,119 |
| **RAVLT A7** | r | | | -0,188 |
| | p | | | 0,191 |

*p<0,05

Table 9 shows the correlations between all four scale scores in the postmenopausal study group.

BDI score was significantly correlated with MRS score (r: 0.609; p<0.05) while it did not have any significant correlation with either A5 or A7 subscales of RAVLT (p>0.05). This finding underlines the fact that participants with higher MRS scores tent to have higher depression scores while lower MRS scores are accompanied with lower BDI scores.

Two subscales of RAVLT; A5 subscale and A7 subscale also showed moderate level significant positive correlation (r: 0.472; p<0.05). Accordingly, both subscale scores tend to move in the same direction: Higher A5 scores are accompanied with higher A7 scores while lower A5 scores tend to be seen with lower A7 scores.

For the postmenopausal group, MRS score did not have any significant association with RAVLT subscales: A5 or A7 (p>0.05).

**Table 10. Correlation analysis between scale scores in premenopausal group**

|  |  | RAVLT A5 | R AVLT A7 |
|---|---|---|---|
| **BDI** | r | -0,059 | -0,219 |
|  | p | 0,683 | 0,127 |
| **RAVLT A5** | r |  | 0,260 |
|  | p |  | 0,068 |

Table 10 displays the correlations between all three scale scores in the premenopausal study group.

As shown in the table, none of the scale scores had significant associations in between (p>0.05).

**Table 11. Regression model to explain A5 subscale score**

|  | Unstandardized Coefficients | | Standardized Coefficients | | |
| --- | --- | --- | --- | --- | --- |
|  | B | Std. Error | Beta | t | P |
| Model Constant | 18,652 | 2,516 |  | 7,415 | 0,000* |
| Menopausal Status | -0,292 | 0,502 | -0,078 | -0,582 | 0,562 |
| Age | -0,153 | 0,055 | -0,374 | -2,785 | 0,006* |
| BDI Score | -0,027 | 0,027 | -0,096 | -1,032 | 0,304 |

*(p<0,05)*
*0 for premenopausal group and 1 for postmenopausal group*
*$R^2$: 0.198*

Table 11 displays the findings of the regression analysis that aims to explain the A5 subscale score (dependent variable) with respect to menopausal status, age and BDI score.

As shown in the table, the coefficient of determination for the model is 19.8%. The only dependent variable which has significant contribution to the model is age with a regression coefficient of -0.153 (p<0.05). This underlines that each additional year of age would decrease the A5 subscale of the participants by 0.153 points.

Menopausal status and BDI score did not significantly contribute to the model that explains A5 subscale score of the RAVLT (p>0.05).

**Table 12. Regression model to explain A7 subscale score**

|  | Unstandardized Coefficients | | Standardized Coefficients | | |
| --- | --- | --- | --- | --- | --- |
|  | B | Std. Error | Beta | t | p |
| Model Constant | 14,083 | 2,902 |  | 4,853 | 0,000 |
| Menopausal Status | -1,297 | 0,580 | -0,302 | -2,238 | 0,028* |
| Age | -0,056 | 0,064 | -0,118 | -0,877 | 0,382 |
| Beck Depression Score | -0,059 | 0,031 | -0,178 | -1,919 | 0,058 |

*(p<0,05)*
*0 for premenopausal group and 1 for postmenopausal group*
$R^2$*: 0.198*

Table 12 shows the findings of the regression analysis that aims to explain the A7 subscale score (dependent variable) with respect to menopausal status, age and BDI score.

As Table 12 indicates, the coefficient of determination for the model is 19.8%.

The only dependent variable which has significant contribution to the model is menopausal status with a regression coefficient of -1.297 (p<0.05). It indicates that entering the menopause decreases the A7 score of the patients by 1.297 points.

Age and BDI score did not significantly contribute to the model that explains A7 subscale score of the RAVLT (p>0.05).

# 4. DISCUSSION

This research was conducted to collect information about depression levels and memory functions of premenopausal and postmenopausal women. The studies on the depression levels of postmenopausal women and the differences in the memory functions of premenopausal women are very rare in our country.

When the socio-demographic characteristics of participants were evaluated, it was found that the average age of women entering menopause was 51.2 and that of women who did not enter menopause was 44.6. In the present study, it was observed that the average age of women entering menopause was 47.5. In a study conducted by Ertüngelap (2003) on behalf of the Turkish Menopausal Association, it is reported that the average age of entering menopause in Turkey is 46.4 ± 1.9. Looking at other studies, Evkuran (2015) reported that the average age of menopause was 47.5 ± 4.4. Uludağ (2014) found that the average age of entering menopause was 47.7 years. These findings in the study are consistent with the literature.

Looking at the short-term memory recollection scores, women who entered menopause were found to have significantly lower memory recollection scores than women who did not enter the menopause. In a review of the literature, a study to investigate short-term memory in postmenopausal women treated with estrogen found that estrogen has positive effects on verbal reading and short-term memory in postmenopausal women in middle age. Considering the result of the study, it is indicated that women in the postmenopausal period have a decrease due to the change of estrogen level in their short-term memories (Shaywitz et al., 2003).

When long-term memory recollection scores when considered, women who entered menopause were found to score significantly lower than women who did not.

When the factors affecting long-term memory are examined in the result of current study, it is seen that it is significantly affected from menopause period. When we look at the literature, we see that menopausal women give significantly lower results in delayed verbal memory than women who do not (Weber, Maki and Dermott, 2014).

In the current study, women who do not enter menopause have a negative relationship between short-term recall scores and age. When analyzed by regression analysis, one of the factors affecting instant recall was found as age. In the literature, it is stated that the results of mental performance tests correlate with age. Elderly women are slower in memory recollection and have made more errors than younger women (Beck, 2000, p. 41; Fuh et al., 2003, p. 431)

In the menopause group, it was found that non-working women had significantly shorter short-term recollection scores than working women.

However, when the difference between the education levels of the participants who did not enter the menopause was examined, it was found that the short-term recollection scores of higher educated women were higher. In a literature review, it was found that cognitive functions of higher educated women were better between postmenopausal and premenopausal women (Fuh et al., 2003).

According to the studies conducted, it is often seen that people who have received higher education as well as women who have been working on intellectually challenging professions, and who enter intellectual development activities are at a lower risk of Alzheimer's disease, and that the concept of "cognitive protection" is used as an explanatory mechanism for these situations. However, those who did not have professional achievements were 2.25 times more likely to develop dementia than those who had professional achievements.

The results of these findings indicate that educational and professional experiences constitute a "cognitive protection" against the development of Alzheimer's. (Stern, 2012). It has been found that the level of education and professional achievements is favorable factor for lowering the risk of dementia, and it is found in studies that it is possible to reduce the risk of dementia and to delay the onset of dementia in people with professional achievements and higher education (Stern et al., 1999).

In the present study, it was found that as the number of children in the menopausal women increased, the score of short-term instant recollection decreased. There is a negative relationship between the number of children and the short-term instant recall score.

In the literature, there are studies that show that women who enter menopause have an increase in menopausal symptoms as the number of children increases (Blumel et al., 2000, Charandabi et al., 2015). In the literature, there are no indications that can allow us to conclude or provide an opinion about short-term instant recollection scores decrease as the number of children increases. The reason for this is thought to be the lack of detailed studies evaluating only the number of children and the memory recollection.

In the current study, the risk for depression among postmenopausal women is higher than for premenopausal women, but the difference is not significant. Depressive symptoms increase at perimenopausal period compared to premenopausal period and it decreases again in postmenopausal period (Freeman et al., 2004, Maartens, Knottnerus and Pop, 2002). Literature findings in this subject indicated that it is not possible to conclude that depression is a common symptom in menopause that every woman does not have depression symptoms and therefore it is difficult to conclude that this is a universal symptom (Freeman, 2010).

It is known that women who apply to menopause clinics report more physical health problems, stressful life events, worse emotions, and tend to view menopause more as a disease. (Hunter, 1990). For this reason, with the thought that they could create a biased sample in this study, the study did not observe women who applied to menopause clinics but rather analyzed women who were selected from the normal population. Despite the lack of a well-structured consistent structure in defining menopausal status, the lack of a standard psychiatric assessment to identify depression, and the selection of samples for both clinical and general populations, cross-sectional and community-based studies, despite methodological limitations, there is an increased risk of developing depression during the menopausal transition phase. (Cohen, 2005). In the current study, only 8 people did not enter menopause naturally and those have not been included in the stu dies and comparisons.

In the current study, care was taken to select women who do not use HRT. Emphasis has been placed on handling cognitive functions in an unbiased manner. In a literature review, neuropsychological tests have shown that performance significantly decreases when the postmenopausal period begins from the premenopausal period. It was also noted that the group using HRT were able to increase their test performance (Fuh et al., 2003).

Demographic characteristics affecting mental health and psychological status of women are emphasized. In the present study, it was found that BDI scores of primary school / secondary school graduates and high school graduates were significantly higher in women who did not enter the menopause than those who were at least university graduates. When we look at the literature, it is stated that research supports the outcome and education affects the severity of depressive symptom (Bezircioglu et al., 2004, Özkan et al., 2005). These results suggest that lower educated women have higher likelihood of haven mental health problems than high educated women.

In this study, depressive symptoms were found to be higher in women with menopausal symptoms. Some studies show that severe vasomotor symptoms are associated with negative emotional state. The current study is consistent with literature (Avis et al., 2001; Dennerstein, Lehert, Burger and Dudley, 1999).

In the present study, there was no significant difference between depression and the number of children in women who did not enter the menopause, but the number of children for women in the menopausal period had a positive correlation with the depression scores. In a study conducted in Turkey, as the number of children increased, the rate of primary depression increased (Önen, Kaptanoğlu and Seber, 1994; Liao, Wood and Conway, 2000).

## 4.1.Limitations of the Study

Clinical interviews with women, was not made, the result are only dependent on the scales. It was not clinical interview but the findings are limited to self-report data and clinical assessment was not made.

There was no information about the premenopausal cognitive level of the participants as the study is not longitudinal. The current study is limited to focusing on verbal memory and other aspects of memory are not evaluated.

# 5. RECOMMENDATIONS

*Suggestions for the Researcher:*

The mean age of menopausal women in the current study is higher than the group who did not even menopause. At another study, women who enter menopause naturally at an early age can only be taken so that there might be no difference between the groups. It is also important to get information about possible early onset dementia and other neurological disorders among family members. Physical examination, including a basic neurological examination and detailed cognitive assessments, would show that the only difference is about memory functions. It may be suggested that women who receive HRT and women who do not receive HRT in the postmenopausal period should be investigated to compare memory function and depression levels.

*Suggestions for Postmenopausal Women:*

Because women spend a significant part of their lives in menopause, they need to know the characteristics of this period well and get help in this regard. Knowing themselves in psychological and physiological terms will help them to have a healthier life quality with the increase of awareness in this subject.

In the current study, it was found that menopause affects long-term memory negatively. Literature findings suggest that HRT uptake is protective for negative cognitive processes and psychological effects that are often experienced during this period. The use of HRT is becoming widespread in preventing postmenopausal complaints. The fact that the use of HRT is not preferred is due to cancer risk or other side effects. Women should be informed about HRT, treatment routes, risks, side effects, and women who receive treatment should be provided with follow-up.

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# APPENDICES
## APPENDIX 1- BİLGİLENDİRME FORMU

**Menopozda Olan ve Olmayan Kadınların Depresyon Düzeylerinin ve Bellek İşlevlerinin Karşılaştırılması**

Bu çalışmanın amacı menopozda olan ve olmayan kadınların depresyon düzeylerinin ve bellek işlevlerinin karşılaştırılmasıdır.

Bu çalışmada size bir demografik bilgi formu ve bir dizi ölçek sunduk. Demografik bilgi formu sizin yaş cinsiyet gibi demografik özellikleriniz hakkındaki soruları içermektedir. Ölçekler ise menopozla ilgili şikayetler, bellek işlevleri ve depresyon belirtilerini ölçmektedir.

Daha önce de belirtildiği gibi, ölçeklerde ve görüşmelerde verdiğiniz cevaplar kesinlikle gizli kalacaktır. Eğer çalışmayla ilgili herhangi bir şikayet, görüş veya sorunuz varsa bu çalışmanın araştırmacılarından biri olan Psk. Gizem Barutcu iletişime geçmekten lütfen çekinmeyiniz (email: gizembarutcu18@gmail.com)

Eğer araştırmanın sonuçlarıyla ilgileniyorsanız, 01.07.2017 tarihinden itibaren araştırmacıyla iletişime geçebilirsiniz.

Katıldığınız için tekrar teşekkür ederim.
Psk. Gizem Barutçu
Psikoloji Bölümü,
Yakın Doğu Üniversitesi,
Lefkoşa.

## APPENDIX 2- AYDINLATILMIŞ ONAM

Bu çalışma, Yakın Doğu Üniversitesi Fen Edebiyat Fakültesi Psikoloji Bölümü tarafından gerçekleştirilen bir çalışmadır.

Bu çalışmanın amacı Menopozda Olan ve Olmayan Kadınların Depresyon Düzeylerinin ve Bellek İşlevlerinin Karşılaştırılmasını incelemektir.

Anket tamamen bilimsel amaçlarla düzenlenmiştir. Anket formunda kimlik bilgileriniz yer almayacaktır. Size ait bilgiler kesinlikle gizli tutulacaktır. Çalışmadan elde edilen veriler yalnızca istatistik veri olarak kullanılacaktır. Yanıtlarınızı içten ve doğru olarak vermeniz bu anket sonuçlarının toplum için yararlı bir bilgi olarak kullanılmasını sağlayacaktır.

Telefon numaranız anketörün denetlemesi ve anketin uygulandığının belirlenmesi amacıyla istenmektedir.

Yardımınız için çok teşekkür ederim.

Psk. Gizem Barutçu

Yukardaki bilgileri ayrıntılı biçimde tümünü okudum ve anketin uygulanmasını onayladım.

İsim:

İmza:

Telefon:

## APPENDIX 3- SOSYO-DEMOGRAFİK BİLGİ FORMU

**1) Yaşınız:** ………….

**2) Eğitim durumunuz:**

 a. İlkokul Mezunu  b. Ortaokul Mezunu   c. Lise Mezunu  d. Üniversite

e. Yüksek Lisans ve Üstü

**3) Çalışma durumunuz**

a. Çalışıyor     b. Çalışmıyor

**4) Mesleğiniz:** …………………………

**5) Medeni durumunuz:**

a. Bekar   b. Evli   c. Boşanmış   d. Dul

**6) Çocuğunuz var mı?**

a. Evet        b.Hayır

  Var ise kaç tane belirtiniz (……………………..)

**7) Menopoza girdiniz mi?**

a. Evet

b. Hayır

**8) Menopoza girdiyseniz girme yaşınız nedir?** (………………..)

**9) Menopoza girdiyseniz size uygun olanı işaretleyiniz**

a. Menopoza doğal yolla girdim

b. Menopoza cerrahi yolla girdim

**10) Menopoz için herhangi bir ilaç kullanıyor musunuz?**

a. Hayır         b. Evet (belirtiniz:…………………………………)

**11) Fiziksel bir sağlık probleminiz var mı?**

a. Hayır         b. Evet (belirtiniz:…………………………………)

**12) Psikolojik bir sağlık probleminiz var mı?**

a. Hayır　　　b. Evet (belirtiniz:……………………………………)

## APPENDIX 4- BECK DEPRESYON ÖLÇEĞİ

Sayın cevaplayıcı aşağıda gruplar halinde cümleler verilmektedir. Öncelikle her gruptaki cümleleri dikkatle okuyarak, Bugün dâhil geçen hafta içinde kendinizi nasıl hissettiğini en iyi anlatan cümleyi seçiniz.

Eğer bir grupta durumunuzu, duygularınızı tarif eden birden fazla cümle varsa her birini daire içine alarak işaretleyiniz. Soruları vereceğiniz samimi ve dürüst cevaplar araştırmanın bilimsel niteliği açısından son derece önemlidir. Bilimsel katkı ve yardımlarınız için sonsuz teşekkürler.

**1-** 0. Kendimi üzüntülü ve sıkıntılı hissetmiyorum.

   1. Kendimi üzüntülü ve sıkıntılı hissediyorum.

   2. Hep üzüntülü ve sıkıntılıyım. Bundan kurtulamıyorum.

   3. O kadar üzüntülü ve sıkıntılıyım ki artık dayanamıyorum.

**2-** 0. Gelecek hakkında mutsuz ve karamsar değilim.

   1. Gelecek hakkında karamsarım.

   2. Gelecekten beklediğim hiçbir şey yok.

   3. Geleceğim hakkında umutsuzum ve sanki hiçbir şey düzelmeyecekmiş gibi geliyor.

**3-** 0. Kendimi başarısız bir insan olarak görmüyorum.

   1. Çevremdeki birçok kişiden daha çok başarısızlıklarım olmuş gibi hissediyorum.

   2. Geçmişe baktığımda başarısızlıklarla dolu olduğunu görüyorum.

   3. Kendimi tümüyle başarısız biri olarak görüyorum.

**4-** 0. Birçok şeyden eskisi kadar zevk alıyorum.

   1. Eskiden olduğu gibi her şeyden hoşlanmıyorum.

   2. Artık hiçbir şey bana tam anlamıyla zevk vermiyor.

   3. Her şeyden sıkılıyorum.

**5-** 0. Kendimi herhangi bir şekilde suçlu hissetmiyorum.

1. Kendimi zaman zaman suçlu hissediyorum.

2. Çoğu zaman kendimi suçlu hissediyorum.

3. Kendimi her zaman suçlu hissediyorum.

**6-** 0. Bana cezalandırılmışım gibi geliyor.

1. Cezalandırılabileceğimi hissediyorum.

2. Cezalandırılmayı bekliyorum.

3. Cezalandırıldığımı hissediyorum.

**7-** 0. Kendimden memnunum.

1. Kendi kendimden pek memnun değilim.

2. Kendime çok kızıyorum.

3. Kendimden nefret ediyorum.

**8-** 0. Başkalarından daha kötü olduğumu sanmıyorum.

1. Zayıf yanların veya hatalarım için kendi kendimi eleştiririm.

2. Hatalarımdan dolayı ve her zaman kendimi kabahatli bulurum.

3. Her aksilik karşısında kendimi hatalı bulurum.

**9-** 0. Kendimi öldürmek gibi düşüncelerim yok.

1. Zaman zaman kendimi öldürmeyi düşündüğüm olur. Fakat yapmıyorum.

2. Kendimi öldürmek isterdim.

3. Fırsatını bulsam kendimi öldürürdüm.

**10-** 0. Her zamankinden fazla içimden ağlamak gelmiyor.

1. Zaman zaman içinden ağlamak geliyor.

2. Çoğu zaman ağlıyorum.

3. Eskiden ağlayabilirdim şimdi istesem de ağlayamıyorum.

**11-** 0. Şimdi her zaman olduğumdan daha sinirli değilim.

1. Eskisine kıyasla daha kolay kızıyor ya da sinirleniyorum.

2. Şimdi hep sinirliyim.

3. Bir zamanlar beni sinirlendiren şeyler şimdi hiç sinirlendirmiyor.

**12-** 0. Başkaları ile görüşmek, konuşmak isteğimi kaybetmedim.

1. Başkaları ile eskiden daha az konuşmak, görüşmek istiyorum.

2. Başkaları ile konuşma ve görüşme isteğimi kaybetmedim.

3. Hiç kimseyle konuşmak görüşmek istemiyorum.

**13-** 0. Eskiden olduğu gibi kolay karar verebiliyorum.

1. Eskiden olduğu kadar kolay karar veremiyorum.

2. Karar verirken eskisine kıyasla çok güçlük çekiyorum.

3. Artık hiç karar veremiyorum.

**14-** 0. Aynada kendime baktığımda değişiklik görmüyorum.

1. Daha yaşlanmış ve çirkinleşmişim gibi geliyor.

2. Görünüşümün çok değiştiğini ve çirkinleştiğimi hissediyorum.

3. Kendimi çok çirkin buluyorum.

**15-** 0. Eskisi kadar iyi çalışabiliyorum.

1. Bir şeyler yapabilmek için gayret göstermem gerekiyor.

2. Herhangi bir şeyi yapabilmek için kendimi çok zorlamam gerekiyor.

3. Hiçbir şey yapamıyorum.

**16-** 0. Her zamanki gibi iyi uyuyabiliyorum.

1. Eskiden olduğu gibi iyi uyuyamıyorum.

2. Her zamankinden 1-2 saat daha erken uyanıyorum ve tekrar uyuyamıyorum.

3. Her zamankinden çok daha erken uyanıyor ve tekrar uyuyamıyorum.

**17-** 0. Her zamankinden daha çabuk yorulmuyorum.

1. Her zamankinden daha çabuk yoruluyorum.

2. Yaptığım her şey beni yoruyor.

3. Kendimi hemen hiçbir şey yapamayacak kadar yorgun hissediyorum.

**18-** 0. İştahım her zamanki gibi.

1. İştahım her zamanki kadar iyi değil.

2. İştahım çok azaldı.

3. Artık hiç iştahım yok.

**19-** 0. Son zamanlarda kilo vermedim.

1. İki kilodan fazla kilo verdim.

2. Dört kilodan fazla kilo verdim.

3. Altı kilodan fazla kilo vermeye çalışıyorum.

**20**- 0. Sağlığım beni fazla endişelendirmiyor.

1. Ağrı, sancı, mide bozukluğu veya kabızlık gibi rahatsızlıklar beni endişelendirmiyor.

2. Sağlığım beni endişelendirdiği için başka şeyleri düşünmek zorlaşıyor.

3. Sağlığım hakkında o kadar endişeliyim ki başka hiçbir şey düşünemiyorum.

**21-** 0. Son zamanlarda cinsel konulara olan ilgimde bir değişme fark etmedim.

1. Cinsel konularla eskisinden daha az ilgiliyim.

2. Cinsel konularla şimdi çok daha az ilgiliyim.

3. Cinsel konular olan ilgimi tamamen kaybettim.

## APPENDIX 5 – İŞİTSEL SÖZEL ÖĞRENME TESTİ

# İŞİTSEL SÖZEL ÖĞRENME TESTİ
### ÖĞRENME VE SERBEST HATIRLAMA İÇİN KAYIT FORMU

Ad Soyad : _____  
Doğum Tarihi : ___ / ___ / ___  
Eğitim Düzeyi : _____

Cinsiyet : _____  
Yaş : _____  
El Tercihi : Sol   Sağ   Her İkisi

Uygulayıcının Adı Soyadı : _____  
Uygulama Tarihi ve Saati : _____  
Uygulama Yeri : _____

### ÖĞRENME VE SERBEST HATIRLAMA / SERBEST HATIRLAMA

| | A1 | | A2 | | A3 | | A4 | | A5 | | B1 | | A6 | | A7 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ✓ | * | ✓ | * | ✓ | * | ✓ | * | ✓ | * | ✓ | * | ✓ | * | ✓ | * |
| 1 | Masa | | Masa | | Masa | | Masa | | Masa | | Ev | | Masa | | Masa | |
| 2 | Anne | | Anne | | Anne | | Anne | | Anne | | Parmak | | Anne | | Anne | |
| 3 | Okul | | Okul | | Okul | | Okul | | Okul | | Havlu | | Okul | | Okul | |
| 4 | Burun | | Burun | | Burun | | Burun | | Burun | | Anahtar | | Burun | | Burun | |
| 5 | Zil | | Zil | | Zil | | Zil | | Zil | | Kuş | | Zil | | Zil | |
| 6 | Kitap | | Kitap | | Kitap | | Kitap | | Kitap | | Altın | | Kitap | | Kitap | |
| 7 | Köpek | | Köpek | | Köpek | | Köpek | | Köpek | | Fırın | | Köpek | | Köpek | |
| 8 | Çiçek | | Çiçek | | Çiçek | | Çiçek | | Çiçek | | Ayakkabı | | Çiçek | | Çiçek | |
| 9 | Düğme | | Düğme | | Düğme | | Düğme | | Düğme | | Kalem | | Düğme | | Düğme | |
| 10 | Elma | | Elma | | Elma | | Elma | | Elma | | Bahçe | | Elma | | Elma | |
| 11 | Bulut | | Bulut | | Bulut | | Bulut | | Bulut | | Gözlük | | Bulut | | Bulut | |
| 12 | Renk | | Renk | | Renk | | Renk | | Renk | | Tuz | | Renk | | Renk | |
| 13 | Balık | | Balık | | Balık | | Balık | | Balık | | Kahve | | Balık | | Balık | |
| 14 | Halı | | Halı | | Halı | | Halı | | Halı | | Perde | | Halı | | Halı | |
| 15 | Ay | | Ay | | Ay | | Ay | | Ay | | Dağ | | Ay | | Ay | |
| Doğru toplamı | | | | | | | | | | | | | | | | |
| Hata toplamı | | | | | | | | | | | | | | | | |
| Tekrarlanan kelime toplamı | | | | | | | | | | | | | | | | |
| Tekrar durumunu sorma toplamı | | | | | | | | | | | | | | | | |
| Tekrarlanıp düzeltilen kelime toplamı | | | | | | | | | | | | | | | | |

# APPENDIX 6 – MENOPOZ SEMPTOMLARINI DEĞERLENDİRME ÖLÇEĞİ

## MENOPOZ SEMPTOMLARINI DEĞERLENDİRME ÖLÇEĞİ

Sevgili hanımlar. Menopoz semptomlarını değerlendirme ölçeğimizde belirtilen yakınmalarından yaşadıklarınız varsa lütfen bu yakınmaları ne düzeyde yaşadığınızı ölçeğimiz üzerinde işaretleyiniz. Şikâyetinizin olmadığı yakınmalar için "hiç yok" seçeneğini işaretleyiniz.

| YAKINMALAR | Puanlar | Hiç yok 0 | Hafif 1 | Orta 2 | Şiddetli 3 | Çok şiddetli 4 |
|---|---|---|---|---|---|---|
| Sıcak basması, terlemeler (Terleme nöbetleri) | | □ | □ | □ | □ | □ |
| Kalp rahatsızlıkları (Normalde hissetmediğiniz şekilde kalpte sıkışma, tekleme, çarpıntı hissi) | | □ | □ | □ | □ | □ |
| Uyku sorunları (Uykuya dalmada güçlük, uzun süre uyuyamama, erken uyanma) | | □ | □ | □ | □ | □ |
| Keyifsizlik hali (Kendini kötü, üzgün, ağlamaklı hissetme, isteksizlik, ruh halinde değişiklik) | | □ | □ | □ | □ | □ |
| Sinirlilik (Sinirlilik, gerginlik ve çabuk öfkelenme hissi) | | □ | □ | □ | □ | □ |
| Endişe / Kaygı (Huzursuzluk, panik hissi) | | □ | □ | □ | □ | □ |
| Fiziksel ve zihinsel yorgunluk (Genel performansta azalma, hafızada zayıflama, konsantrasyon zorluğu, unutkanlık) | | □ | □ | □ | □ | □ |
| Cinsel sorunlar (Cinsel istekte, cinsel ilişkide ve doyum almada değişiklik) | | □ | □ | □ | □ | □ |
| İdrar sorunları (İdrar yaparken güçlük, sık idrara çıkma, idrar kaçırma) | | □ | □ | □ | □ | □ |
| Haznede (Vajinada) kuruluk (Haznede kuruluk ve yanma hissi, cinsel birleşmede zorlanma) | | □ | □ | □ | □ | □ |
| Eklem ve kas rahatsızlıkları (Eklemlerde ağrı, romatizma şikâyetleri) | | □ | □ | □ | □ | □ |

İlginiz ve yardımlarınız için çok teşekkürler

# APPENDIX 7 – CURRICULUM VIATE

**1. Name, Surname:** Gizem Barutçu

**2. Date of birth:** 18/09/1992

**3. Title:** MSc

**4. Education Status:** Master Degree

| Degree | Department | University | Years |
|--------|-----------|-----------|-------|
| **University** | Psychology | Cyprus International University | 2010-2015 |
| **Postgraduate** | Clinical Psychology | Near East University | 2015-2017 |

**5. Academic Degree**

| ASSIGNMENT PERIOD | DEGREE | DEPARTMENT | UNIVERSITY |
|-------------------|--------|-----------|-----------|
| 2015-2017 | Assistant | Psychology | Near East University |

**Master's Thesis:**

Barutçu, G. (2017). Menopozda Olan ve Olmayan Kadınların Bellek İşlevleri ve Depresyonla İlişkisi, Yüksek Lisans Tezi. Yakın Doğu Üniversitesi. Sosyal Bilimler Enstitüsü Lefkoşa, Kıbrıs.

**APPENDIX 8**

Belge No: 2015/1897

# NÖROPSİKOLOJİK TEST EĞİTİMİ SERTİFİKASI

## GİZEM BARUTÇU

02-05 Şubat 2015 tarihlerinde düzenlenen kuramsal ve uygulamalı eğitim programını başarıyla tamamlayarak **"Nöropsikolojik Test (BİLNOT Bataryası) Eğitimi"** uygulama ve puanlama sertifikasını almaya hak kazanmıştır.

Prof. Dr. Sirel Karakaş
*Psikofizyoloji ve Nöropsikoloji Derneği*
*Yönetim Kurulu Başkanı*

Doç. Dr. Emel Erdoğan Bakar
*Eğitimci*
*Psikofizyoloji ve Nöropsikoloji Derneği*
*Üyesi*

Yrd. Doç. Dr. Elvin Doğutepe Dinçer
*Eğitimci*
*Psikofizyoloji ve Nöropsikoloji Derneği*
*Üyesi*

**APPENDIX 9**



YAKIN DOĞU ÜNİVERSİTESİ

**BİLİMSEL ARAŞTIRMALAR ETİK KURULU**

30.03.2017

Sayın Doç. Dr. Ebru Çakıcı,

Bilimsel Araştırmalar Etik Kurulu'na yapmış olduğunuz YDÜ/SB/2017/18 proje numaralı ve **"Menopozda Olan ve Olmayan Kadınların Depresyon Düzeylerinin ve Bellek İşlevlerinin Karşılaştırılması"** başlıklı proje önerisi kurulumuzca değerlendirilmiş olup, etik olarak uygun bulunmuştur. Bu yazı ile birlikte, başvuru formunuzda belirttiğiniz bilgilerin dışına çıkmamak suretiyle araştırmaya başlayabilirsiniz.

Yardımcı Doçent Doktor Direnç Kanol

Bilimsel Araştırmalar Etik Kurulu Raportörü

**Not:** Eğer bir kuruma resmi bir kabul yazısı sunmak istiyorsanız, Yakın Doğu Üniversitesi Bilimsel Araştırmalar Etik Kurulu'na bu yazı ile başvurup, kurulun başkanının imzasını taşıyan resmi bir yazı temin edebilirsiniz.

**APPENDIX 9 – SIMILARITY INDEX**

NEAR EAST UNIVERSITY
GRADUATE SCHOOL OF SOCIAL SCIENCES
CLINICAL PSYCHOLOGY
MASTER'S PROGRAMME

MASTER'S THESIS

# MEMORY FUNCTIONS AND DEPRESSION IN POSTMENOPAUSAL AND PREMENOPAUSAL WOMEN

**Prepared by**

**Gizem BARUTÇU**

**Examining Committee in Charge**

| | |
|---|---|
| **Assoc. Prof. Dr. Ebru ÇAKICI** | **Near East University** |
| | **Department of Psychology** |
| | **(Supervisor)** |
| **Assoc. Prof. Dr. Zihniye Okray** | **European University Of Lefke** |
| | **Department of Psychology** |
| **Assist. Prof. Dr. Deniz Ergün** | **Near East University** |
| | **Department of Psychology** |

**Approval of the Graduate School of Social Sciences**

**Assoc. Prof. Dr. Mustafa SAĞSAN**

# YAKIN DOĞU ÜNİVERSİTESİ
## NEAR EAST UNIVERSITY
## SOSYAL BİLİMLER ENSTİTÜSÜ
## GRADUATE SCHOOL OF SOCIAL SCIENCE

# DECLARATION

**Type of Thesis:**     **Master** ■     **Proficiency in Art** ☐     **PhD** ☐

**STUDENT NO**   **:** 20158252

**PROGRAME**     **:** CLINICAL PSYCHOLOGY MASTER'S PROGRAMME

I am Gizem BARUTÇU, hereby declare that this dissertation entitled " Memory Functions and Depression in Postmenopausal and Premenopausal Women" has been prepared myself under the guidance and supervision of " Assoc. Prof. Dr. Ebru ÇAKICI" in partial fufilment of The Near East University, Graduate School of Social Sciences regulations and does not to the best of my knowledge breach ant Law of Copyrights and has been tested for plagarism and a copy of the result can be found in the Thesis.

Signature: