The Effect of Gardening Activities Applied to Elderly People in Nursing Homes on Psychological Well-Being and Depression: A Single-Blind Randomized Controlled Study Protocol

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ABSTRACT

Introduction: With the enhancement of technology, health services and living conditions are improving as well as increased life expectancy, which are associated with gradually increasing number of elderly population. Gardening is an activity that contributes to the active aging process of the elderly. This research will be conducted in order to determine the effect of gardening activities applied to elderly people in nursing homes on their psychological well-being and depression.

Methods/design: The research has been planned as a single blind randomized controlled experimental study. It will be conducted on 46 elderly people staying in a nursing home. The participants will be assigned to the experimental and control group using the simple randomization method, each consisting of 23 individuals. The research data will be collected using the "Elderly Introduction Form", "The Mini Mental State Test", "Psychological Well-Being Scale", and "Geriatric Depression Scale". In the research, gardening activities will be conducted with elderly people in the experimental group once a week for 3 months. No interventions will be applied to those in the control group, they will participate in routine activities. The pretest will be applied prior to the research to experimental and control groups, and posttest will be applied on the third month.

Conclusions: This research will evaluate the effect of gardening activities applied to elderly people in nursing homes on their psychological well-being and depression. The activities in this study will be cost-effective that can be applied for the active aging process.

Trial registration: ClinicalTrials.gov NCT05256680

Keywords: Nursing home, elderly, gardening activities, psychological well-being, depression, nursing

Huzurevindeki Yaşlılara Uygulanan Bahçecilik Faaliyetlerinin Psikolojik İyi Oluş ve Depresyona Etkisi: Tek Kör Randomize Kontrollü Çalışma Protokolü

ÖZET

Giriş: Teknolojinin gelişimiyle birlikte, sağlık hizmetleri ve yaşam koşulları iyileşmekte ve yaşam süresi uzamakta ve yaşlı nüfus sayısı giderek artmaktadır. Bahçecilik faaliyetleri yaşlıların aktif yaşlanma sürecine katkı sağlayan bir faaliyettir. Bu araştırma huzurevindeki yaşlılara uygulanan bahçecilik faaliyetlerinin psikolojik iyi oluş ve depresyona etkisini belirlemek amacıyla yapılacaktır.

Metot: Bu araştırma tek kör randomize kontrollü deneysel çalışma olarak planlanmıştır. Araştırma bir huzurevinde kalan 46 yaşlı üzerinde yürütülecektir. Yaşlılar deney ve kontrol grubuna basit randomizasyon yöntemiyle atanacak ve 23 deney 23 kontrol grubu yaşlı üzerinde çalışılacaktır. Araştırmanın verileri "Yaşlı Tanıtım Formu", "Standardize Mini Mental Test", "Psikolojik İyi Oluş Ölçeği" ve "Geriatrik Depresyon Ölçeği" ile toplanacaktır. Araştırmada deney grubunda yer alan yaşlılara 3 ay boyunca haftada bir kez bahçecilik faaliyetleri yaptırılacaktır. Kontrol grubunda yer alan yaşlılara araştırma süresince herhangi bir girişim uygulanmayacak huzurevindeki rutin etkinliklere katılacaklardır. Deney ve kontrol grubu yaşlılara ön testler 0.ayda ve son testler 3.ayda uygulanacaktır.

Sonuçlar: Bu araştırma huzurevindeki yaşlılara uygulanan bahçecilik faaliyetlerinin psikolojik iyi oluş ve depresyona etkisini değerlendirecektir. Bu çalışmada uygulanacak bahçecilik faaliyetleri aktif yaşlanma sürecinde yaşlılar için uygulanabilecek uygun maliyetli bir aktivite olacaktır.

Trial Numarası: ClinicalTrials.gov NCT05256680

Anahtar Kelimeler: Huzurevi, yaşli, bahçecilik faaliyetleri, psikolojik iyi oluş, depresyon, hemşirelik

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INTRODUCTION

In our era, the improvement of living conditions, the development of health services and technology are leading to an increase in life expectancy and, consequently, the elderly population is gradually increasing (Arpacı, 2009). It is estimated that there are 727 million people aged 65 and over worldwide in 2020, and this number will be 1.5 billion by 2050. The proportion of the elderly in the global population is expected to increase from 9.3 percent in 2020 to 16.0 percent in 2050 (WHO, 2021). In Turkey, while the population aged 65 and over was 6 million 495 thousand 239 people in 2015, it increased by 22.5% in five years and became 7 million 953 thousand 555 people in 2020. The proportion of the elderly population in the total population increased from 8.2% in 2015 to 9.5% in 2020 (TUİK, 2021). Elderliness is a period when a person passes from independence to dependence, both physically and mentally, along with biological, physiological, psychological and socio-economic changes (Arpacı, 2009; Koldaş, 2017). Since it is a process that causes a decrease in functional abilities, it also brings some physical, spiritual and social problems. In this context, the importance of elderly care is gradually increasing (Kulaksızoğlu, 2009).

Reasons such as urbanization, internal and external migration, transitioning to the nuclear family, decreasing number of extended families, financial problems, women participating in the working life, perspective of young people toward elderly, and increasing dependency and deterioration of health with age complicate elderly home care and increase the number of the elderly in the institutional care (Drageset et al., 2008). Within the framework of social security and social service programs in Turkey, nursing homes take the first place in the elderly services as institutional care (Aksüllü & Doğan, 2004). They are considered suitable environments for elderly people who have difficulty maintaining their daily lives independently (Arpacı, 2005). The daily needs of the elderly staying in nursing homes such as eating, drinking, housing, and cleaning are met, their medical care and treatment are provided, as well as support psychological and social support (Arpacı et al., 2015). However, they experience psychological problems due to various reasons such as adapting to the environment, getting used to live with a group of elderly individuals, building interpersonal relationships, and being dependent on minimum freedom of choice and committing a routine lifestyle (Chuang & Abbey, 2009). It is stated that the most common mental problems in the elderly are depression, delirium, dementia, anxiety disorders, sleep problems and fear of death (Ağar, 2020).

Susceptibility to depression increases in the elderly due to deceleration in cognitive functions, functional impairment, deceleration in psycho-motor movements, reduced ability in problem solving and starting a task, history of psychiatric illness, limited social activity, living alone, chronic disease, low educational status, being unmarried, inadequate social support, stress, and staying in nursing home and assisted living (Halil, 2008; Byers et al. 2010). It is noted that untreated or partially treated geriatric depression in the elderly have adverse outcomes, and can result in death due to suicide and diseases (Royall et al., 2007; Mitty & Flores, 2008). When we examine the literature, it is seen that the

level of depression is higher in elderly people staying in nursing homes than those living at home (Maral et al., 2001; Şahin & Yalçın, 2003). As a matter of fact, in a study conducted by Şahin & Yalçın (2003), on elderly people living in a nursing home and at their own homes, the level of depression was higher in those living in a nursing home; while Aksüllü & Doğan (2004), found that those living in a nursing home had higher level of depressive symptoms than those living at home; and Maral et al. (2001), reported that the prevalence of depression and risk factors that may affect elderly people living in a nursing home are more common. Psychological well-being levels of elderly people staying in nursing homes are very important in terms of their quality of life (Kovalenko & Spivak, 2018). It is stated that the elderly with high level of psychological well-being has also have higher physiological and psychological health and quality of life (Keyes et al., 2010). Well-being is defined as the state of not having anxiety, worry, depression and other psychological disorders in an individual's life. In addition, psychological well-being is defined as self-realization and meaningful life in situations such as maintaining meaningful goals, personal development, and establishing quality interpersonal relationships (Keyes et al., 2002). The concept of psychological well-being was first suggested by Bradburn. According to Bradburn (1969), when positive affect exceeds the negative one, an individual's psychological well-being is high; while it is the opposite with an exceeding level of negative affect. Individuals with a high level of psychological well-being accept themselves as they are, have meaningful goals in life, continue their personal development and establish qualified relationships with other individuals (Deniz et al., 2017). It is stated that the level of psychological well-being decreases with age (Kovalenko & Spivak, 2018). The personal meaning and resources of the elderly affect their level of psychological well-being (Eryılmaz & Atak, 2011; Haugan, 2014; Krok, 2015; Hoeyberghs et al., 2019; Reyes et al., 2020). In studies conducted by Mantovani et al. (2016) and Inel et al. (2021), it is stated that the experience of personal meaning in life in the elderly improves the positive aspects of old age and increases psychological well-being.

It is important for active aging to prioritize policies that can improve the personal experiences of meaning in the elderly, and make regulations on this issue in order to increase their level of psychological well-being (Altan & Şişman, 2003). Today the belief toward active aging is gradually increasing (Çolak & Özer, 2015). Active participation in social, financial, political and cultural areas in the elderly makes positive contributions to mental health and increases psychological well-being (WHO, 2002). It is stated that each initiative made to protect and improve the health of the elderly contributes to active aging (Rappe, 2005; Şahin & Emiroğlu, 2014). It is important to implement cost-effective, easily accessible and adoptable active aging strategies for the elderly (Chan et al., 2017). Active aging is an important process that ensures successful, healthy, and productive aging (Çolak & Özer, 2015). The World Health Organization defines active aging as the process of increasing participation, health and safety opportunities for people to improve their quality of life as they get older (WHO, 2019). It is important for individuals to participate interested activities in the active aging process (Demirbilek & Özgür, 2017).

Gardening activities are one of the physical activities that can contribute to the active aging process of the elderly (Gardening For Older People, 2014 ; Scott et al., 2015; Chan et al., 2017). They can vary from a wide range covering all kinds of interactions with nature and plants to a narrow framework on active communication with plants (Gonzalez et al., 2010). Gardening includes the cultivation and care of fruits, vegetables and ornamental plants (Özcan, 2020). It is stated that it offers positive contributions to the physical, spiritual and social health of the elderly (Barnicle & Midden, 2003; Rappe & Kivela, 2005; Collins & O'Callaghan, 2008; Detweiler et al., 2012; Perveen, 2013; Kabakcı & Gök Uğur, 2021). Within the scope of gardening activities, it is reported that the elderly take responsibility, take care of the plants and harvest the products, which have a positive impact on their mental health (Masuya et al., 2014).

Nurses have a great role and responsibility in carrying out activities such as gardening that support active aging in the elderly, increase their psychological well-being, contribute to the increase of autonomy and freedom, and develop a sense of responsibility (Kulakçı & Emiroğlu, 2011). They also have an important position in elderly health services for health issues related to mobility and disability (Kulakçı & Emiroğlu, 2011; Canlı & Karataş, 2018; Canlı, 2019). The International Council of Nurses (ICN) defined the roles and responsibilities of nurses related to the elderly in 1992. These roles and responsibilities include helping the elderly to maintain independence, improving the quality of life, supporting them to maintain their own care, reducing the incidence of chronic diseases and minimizing the loss of functions due to aging (International Council of Nurses, 2021). In this context, it is important for nurses to support the elderly, especially in terms of physical activity and quality of life (Demet et al., 2002; Şahin et al., 2012). Physical activity in old age is very important in reducing the incidence of diseases, improving the quality of life and increasing the average life expectancy (Chakravarty et al., 2008; Duggal et al., 2018; Pollock et al., 2018). Nurses should help the elderly to act independently by ensuring their participation in activities that support their active aging (Canlı & Karataş, 2018).

Gardening activities are regularly carried out in some countries, especially in nursing homes. It is stated that such activities that will involve the elderly in active life are quite limited in Turkey (Yavuz & Yavuz, 2018). The activities implemented for the elderly in nursing homes are very important in terms of improving the quality of life and reducing depression (Zincir et al., 2008). In addition, it is emphasized that being interested in activities that create a sense of purpose in the elderly is important for psychological well-being and reducing depressive symptoms (Windsor et al., 2015). The results that may emerge from the examination of the impact of gardening activities on elderly health are very important in terms of planning and guiding the implementation of long-term care of the elderly in institutional care (Nicholas et al., 2019).

Objectives: This research will be conducted in order to determine the effect of gardening activities applied to elderly people in nursing home on their psychological well-being and depression.

Research Hypotheses

$H_0$1: Gardening activities applied to the elderly in the nursing home have no effect on their psychological well-being.

$H_1$1: Gardening activities applied to the elderly in the nursing home increase their psychological well-being.

$H_0$2: Gardening activities applied to the elderly in the nursing home have no effect on their level of depression.

$H_1$2: Gardening activities applied to the elderly in the nursing home reduce their level of depression.

METHODS

Research Type

This research was planned as a single blind randomized controlled experimental study.

Research Place and Time

The research will be conducted between January, 2022 and January, 2023 on elderly people staying in a nursing home in Turkey.

Research Universe and Sample

The universe of the research will consist of 59 elderly people staying in a nursing home in Turkey. The sample will consist of 46 elderly people staying in a nursing home who meet the research criteria and agree to participate in the study. In order to determine the sample size of the research, power analysis has been performed using the G-Power 3.1.9.4 program. The sample size was calculated based on the effect size of the study conducted by Ng et al. (2018). In the calculation, conducted according to the independent samples t-test, the effect size was found 0.80, while the margin of error (α=0.05) was and the total number of samples was 42 with a statistical power of 80% (Cohen, 1988; Faul et al., 2007). Considering the data loss during the research process, it was planned to study on a total of 46 people, adding 10% of the calculated sample size.

Randomization of the Research

In the research, preliminary tests will be applied after obtaining the consent of the elderly who meet the research criteria and agree to participate in the research. Then, the elderly will be assigned to the experimental and control groups using simple randomization method. For simple randomization, elderly will be ranked from 1 to 46, and randomly distributed into 2 groups via .computer randomizer.org (Research Randomizer, 2022).

The first 23 people in the random distribution will be assigned as group A and the next 23 people will be assigned as group B. Group A and group B will be determined as experimental and control group by lot.

Table 1. Distribution of Participants into Groups

(randomizer.org)

2 Sets of **23 Unique** Numbers Per Set

Range: From **1** to **46**

Set #1(A)

35, 37, 21, 33, 40, 22, 26, 42, 12, 17, 10, 46, 4, 43, 1, 31, 38, 8, 36, 34, 20, 25, 5

Set #2(B)

23, 18, 24, 15, 11, 32, 7, 30, 39, 44, 2, 19, 13, 41, 6, 29, 45, 9, 28, 16, 3, 27, 14

Research Blinding and Prevention of Bias

The study protocol of the research will be created by following the SPIRIT guide (Akın & Koçoğlu-Tanyer, 2021). The reporting of the research will be structured according to the CONSORT checklist (Schulz et al., 2010). "In order to prevent selection bias, the elderly will be randomly assigned to the experimental and control groups using simple randomization. The participants will not be informed about their group. In order to prevent detection bias during measurements, the posttests of the study will be administered by a graduate nurse, who is not among the researchers. If considered necessary, an ITT (intention-to-treat) analysis will be performed to prevent reduction bias. In order to prevent reporting bias, the data will be analyzed by an expert statistician".

Inclusion Criteria

- Staying in a nursing home for at least 3 months,
- Not having a physical disability interfering with gardening activities,
- Not having vision and hearing loss that may interfere with gardening activities,
- Being open to communication and cooperation,
- Volunteering to participate

Exclusion Criteria

- Having a serious medical disability (Stroke, Parkinson's etc.),
- Having a serious psychiatric diagnosis,
- Having a severe dementia
- Not willing to continue the research

Research Variables

Dependent variables: The mean scores of Psychological Well-Being Scale and Geriatric Depression Scale.

Independent variables: Gardening activities applied to the elderly.

Control variables: Socio-demographic characteristics of the elderly, mean scores of the Mini Mental State Test.

Data Collection Instruments

The research data will be collected using the "Elderly Introduction Form", "The Mini Mental State Test", "Psychological Well-Being Scale", and "Geriatric Depression Scale".

Elderly Introduction Form

This form was prepared by the researcher in accordance with the literature (Masuya et al., 2014; Makizako et al., 2015; Chan et al., 2017; Ng et al., 2018; Thompson 2018; Nicholas et al., 2019). It consists of 14 questions about the socio-demographic characteristics of the elderly (age, gender, marital status, number of children, educational level, the longest place of residency, duration of living in a nursing home, presence of chronic illness, the type of chronic illness, regular medication, status of receiving a psychiatric diagnosis, status of taking medication for psychiatric illness, participating in activities conducted in the nursing home and being interested in gardening activities).

The Mini Mental State Test

The Mini Mental State Test, developed by Folstein et al. in 1975 to assess cognitive status is the most commonly used and easily applied test for dementia screening (Folstein, 1975). "The validity and reliability for the Turkish population in the diagnosis of mild dementia was conducted by Güngen et al. (2002). The test has five main themes as orientation (10 points), immediate memory (3 points), attention and calculation (5 points), recall (3 points), and language (9 points). The scale is evaluated over a total of 30 points and there are two different types for the educated and the uneducated. Traditionally, scores ranging from 24 to 30 are considered normal. A score below 24 indicates cognitive impairment. Those between 18 and 23 are considered mild dementia, between 12 and 17 are considered moderate dementia, and those below 12 is considered severe dementia".

Psychological Well-Being Scale (PERMA)

In order to evaluate the well-being levels of individuals, the Turkish validity and reliability studies of the scale, developed by Butler & Kern (2016), were conducted by Demirci et al. (2017). The scale consists of 15 items, 8 filler items and 5 subscales. The name of the scale consists of the English initials of the subscales.

"The PERMA Scale subscales and calculations are as follows";

- (P) "Positive Emotion: It includes positive emotions such as happiness, joy, and comfort. Items 5, 10 and 22 are included in this subscale".

- (E)" Engagement: It is a state of establishing a deep connection with a certain activity, goal, being in the flow, and immersing oneself in it in an activity. Items 3, 11 and 21 are included in this subscale".
- (R) "Relationship: It indicates that people integrate into the society they live in, are satisfied with their social relationships, and receive support and attention from their loved ones. Items 6, 15 and 19 substances are included in this subscale".
- (M) "Meaning: It indicates individuals' awareness of the purpose of life, the feeling that life is valuable and worth living. Items 1, 9 and 17 are included in this subscale".
- "Accomplishment: It evaluates the feeling of making effort to achieve goals and fulfilling daily responsibilities. It includes items 2, 8 and 16".

"In the evaluation of the scale, the average score of the items of each subscale is taken into consideration. However, while none explains the level of well-being; each dimension has contribution. In addition, apart from the well-being subscales, Butler & Kern (2016) added 6 of the 8 filling items to the scale as two separate subscales named H health (Overall wellbeing) (items 4, 13 and 18) and N negative emotions (items 7, 14, 20). The Cronbach's alpha reliability coefficient of the scale is 0.91".

The Geriatric Depression Scale (GDS)

This self-reporting scale was developed by Yesavage et al.(1993), The short form of the GDS consisting of 15 questions will be used in this study. "The Turkish validity and reliability study of the scale was conducted by Ertan et al. (1997). The 5 questions on the scale (1, 5, 7, 11 and 13) are positive. The statement "no" is rated as 1 point for the positive questions, while "yes" is rated as 1 point for the negative questions. The scores to be obtained from the scale range between 0 and 15. A score above five is considered to indicate depression. The Cronbach's alpha value of the scale is 0.92".

Data Collection

The data will be collected after obtaining the necessary institutional permissions and ethics committee approval. The pretests will be conducted in a room that is considered suitable for data collection by the nursing home managers on the elderly in the experimental and control groups meeting the inclusion criteria. The pretest data will be collected using the "Elderly Introduction Form", "Mini Mental State Test", "Psychological Well-being Scale" and "Geriatric Depression Scale" through face-to-face interviews lasting an average of 30 minutes. The posttest data of the study will be collected 3 months after the start of the research using the "Psychological Well-Being Scale" and the "Geriatric Depression Scale" with face-to-face interviews conducted with both groups for an average of 20 minutes.

Application of Gardening Activities

In the research, gardening activities will be conducted with elderly people in the experimental group once a week for 3 months (Chan et al., 2017). The elderly will do gardening activities for 30 minutes in each session, take a break for 20 minutes, and continue for another 30 (Chan et al., 2017; Ng et al., 2018).

Table 2. Application Process of Gardening Activities

Sessions	**Activities**	**Place**
Session 1	-Introduction of gardening activities	Nursing Home
Session 2	-Flower pot design	Botanical Garden
Session 3	-Flower pot design	Botanical Garden
Session 4	-Grafting -Planting	Botanical Garden
Session 5	-Sowing/Planting Observation -Collecting seeds -Planting	Botanical Garden
Session 6	-Sowing/Planting Observation -Walking in the Garden	Botanical Garden
Session 7	-Sowing/Planting Observation -Making a seed bomb	Botanical Garden
Session 8	-Sowing/Planting Observation -Throwing seed bombs	Botanical Garden
Session 9	-Sowing/Planting Observation -Photo shooting in nature	Botanical Garden
Session 10	-Sowing/Planting Observation - Terrarium design	Botanical Garden
Session 11	-Sowing/Planting Observation -Terrarium design	Botanical Garden
Session 12	-Sowing/Planting Observation -Flower arrangement	Botanical Garden

The Place of the Activities

The first session of gardening activities will be held in the nursing home for the elderly in the experimental group within the scope of the research, and the program will be introduced. Gardening activities will be conducted in a botanical garden.

Control Group

No intervention will be applied to the elderly in the control group during the research. They will participate in routine activities at the nursing home. In addition, after the posttest is applied, a session will be conducted with them in the botanical park.

Ethical Considerations

The permissions were received from the authors of the "Mini Mental State Test", "Psychological Well-Being Scale", and "Geriatric Depression Scale" via email. The institutional permission and the ethical approval of the Ethics Committee of the Ordu University Clinical Research Ethics Committee were obtained for the research (Decision No: 2021/270). The purpose and benefits of the study were explained to the elderly who agreed to participate in the study and their verbal and written consent was obtained.

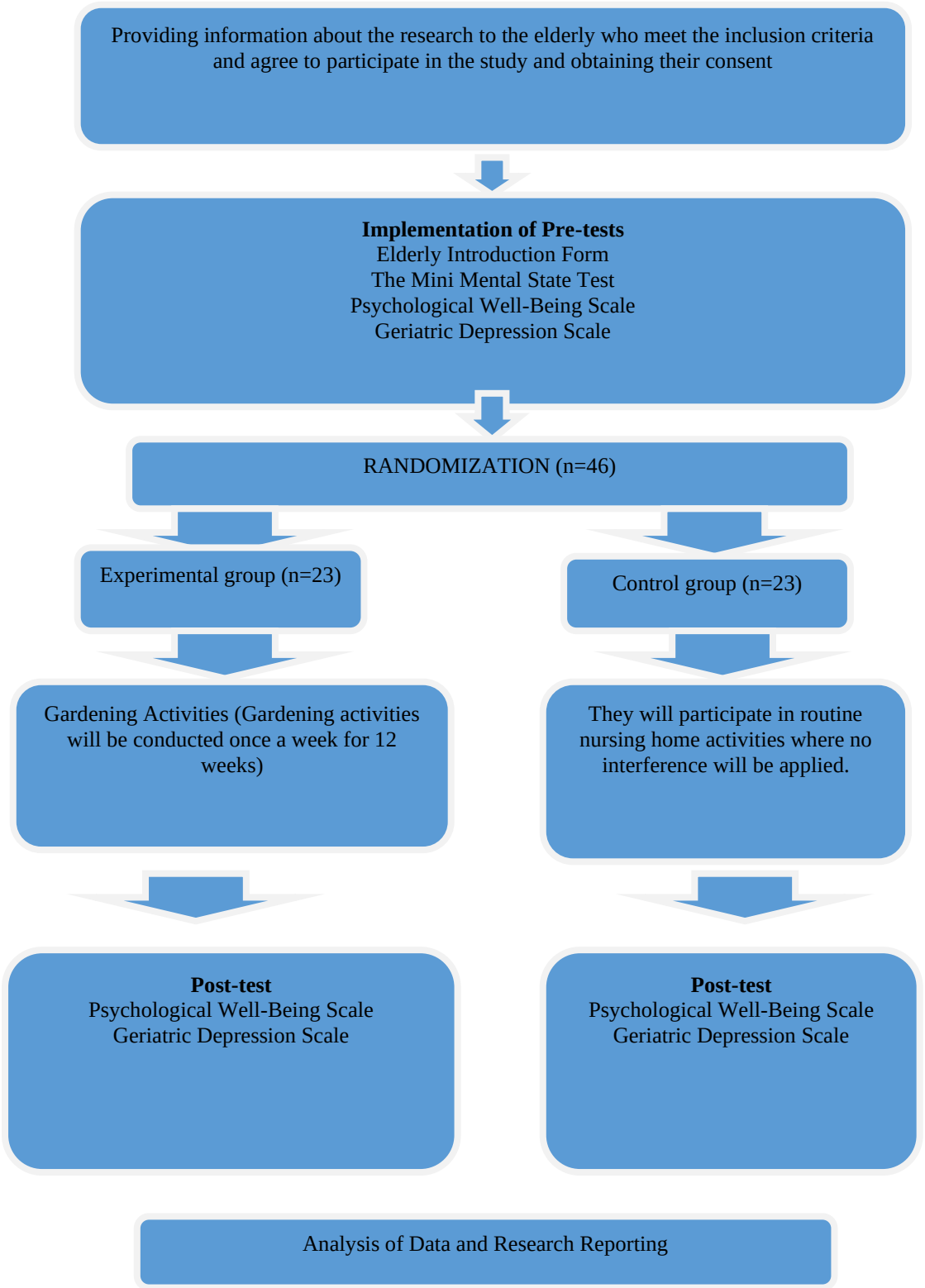
Evaluation of the Data

The data analysis will be carried out by an expert statistician in a computer environment. The conformity of the data to the normal distribution will be evaluated. If the data shows a normal distribution, parametric tests will be used, while non-parametric will be performed in the opposite case. Pearson's chi-square, Yates-corrected chi-square and Fisher's exact tests will be used to compare categorical variables according to the groups. Two independent sample t-test or Mann Whitney U test will be used to compare the normally distributed data according to binary groups. Generalized linear models and multiple comparisons will be performed with the Tukey test in the comparison of normally distributed data according to group and time. The data that are not normally distributed according to group and time will be evaluated using the two-way Robust test and multiple comparisons Bonferroni test. The significance will be set at $p<0.05$.

DISCUSSION

This research will be conducted in order to determine the effect of gardening activities applied to elderly people living in a nursing home in Turkey on their psychological well-being and depression. Elderly people living in nursing homes are trying to adapt to the institution with their changing lifestyles (Chuang & Abbey, 2009). They experience many psychosocial problems during the adjusting process (Walker et al., 2007; Şahin & Yalçın 2003; Aksüllü & Doğan, 2004). In this context, it is important to improve their psycho-social health. The implementation of cost-effective activities in nursing homes can make positive contributions to their psychological well-being (Nicholas et al., 2019).

Research Plan



Gardening activities are one of the non-pharmacological methods that are becoming increasingly popular to improve the well-being of elderly individuals. They offer positive contributions to elderly health in different point of views (Kabakcı & Gök Uğur, 2021). It is stated that they have various positive effects in physical, spiritual and social aspects (Detweiler et al., 2012). They are also emphasized to reduce stress, mood disorders, depression and anxiety levels in the elderly, while increasing life satisfaction, happiness and psychological well-being (Kabakcı & Gök Uğur, 2021).

When the literature was examined, in a study by Masuya et al. (2014), it was stated that gardening activities had positive effects on depression level, quality of life and life satisfaction, while a study by Ng et al. (2018), found that gardening activities improved interpersonal relationships, cognitive function, psychological well-being, and reduced the level of anxiety and depression; Gonzalez et al. (2011), also mentioned that they reduced the level of stress and depression; and Makizako et al. (2015), stated that they offered positive contributions to cognitive impairment and depression. In addition, it is stated that gardening offers positive contributions to the mental health of elderly individuals; reduce stress, mood disorders, depression and anxiety levels; and increase psychological well-being (Nakagawa & Santos, 2012; Beyer et al., 2014; Chen & Ji, 2015; Li et al., 2016). Examination of the effects of gardening activities on elderly health is important in terms of guiding the support of long-term care in institutions such as nursing homes. This study is of great value in terms of emphasizing the place of gardening activities for the mental health of elderly individuals and being a pioneer on this topic.

RESULT

The results of this study will contribute to the literature on the effect of gardening activities applied to elderly people in nursing homes on their psychological well-being and depression levels. The findings will provide a database for further studies and contribute to increasing psychological well-being levels in elderly people in nursing homes, while reducing depression and improving the health in general.

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