

# The Effect of Body Percussion on Balance and Coordination in Elderly People

## Yaşlılarda Beden Perküsyonunun Denge ve Koordinasyon Üzerine Etkisi

<sup>id</sup> Nuray GİRGIN<sup>a</sup>, <sup>id</sup> Zeliha Candan ALGUN<sup>b</sup>

<sup>a</sup>Department of Physiotherapy and Rehabilitation, İstanbul Okan University Faculty of Health Sciences, İstanbul, TURKEY

<sup>b</sup>Department of Physiotherapy and Rehabilitation, İstanbul Medipol University Faculty of Health Sciences, İstanbul, TURKEY

**ABSTRACT Objective:** This study aims to determine the effects of body percussion (BP) on balance and coordination in elderly people. **Material and Methods:** We analyzed fifty participants by randomly assigning them to intervention and control groups. The intervention group had percussion work for 3 days per week, whereas the control group did not participate in percussion. The groups' static balance was evaluated with Romberg, Single Leg Stance Test, and Functional Reach, while the evaluation of dynamic balance was based on 360° Turn Test and Four Step Square Test. Lastly, the Berg Balance Scale was used to measure the functional balance, along with the ruler drop test for reaction time. Multiple measures such as finger to nose, supination-pronation, knee heel, Lower Extremity Motor Coordination Test, and Soda Pop Coordination Test were used to demonstrate the effects on the coordination. The first measurements were made at the beginning of the study, followed by the comparison measurements at the 8<sup>th</sup> week. **Results:** The results pointed out that significant intra-group differences were found in the intervention group in terms of the Single Leg Stance Test and the Functional Reach Test ( $p=0.013$  and  $p=0.000$ ), as well as 360° Turn Test and the Four Square Step Test ( $p=0.000$  and  $p=0.000$ ). The outcomes of the finger to nose ( $p=0.032$ ), supination-pronation ( $p=0.020$ ), and Lower Extremity Motor Coordination ( $p=0.003$ ) tests significantly improved in the intervention group. **Conclusion:** The results demonstrated that BP significantly affects coordination and balance in elderly people. BP has promising effects as a physical activity for the elderly.

**Keywords:** Coordination complexes; exercise; frail elderly; percussion; postural balance

**ÖZET Amaç:** Bu çalışmanın amacı, yaşlılarda beden perküsyonunun (BP) denge ve koordinasyon üzerine etkilerini belirlemektir. **Gereç ve Yöntemler:** 50 katılımcı, çalışma ve kontrol grubu olarak 2'ye ayrılmıştır. Çalışma grubunda, haftada 3 gün perküsyon çalışması yapılırken, kontrol grubu perküsyona katılmamıştır. Romberg Testi, Tek Ayak Duruş Testi ve Fonksiyonel Uzanma Testi ile statik denge; 360° Dönme Testi, Dört Kare Adım Testi ile dinamik denge değerlendirilmiştir. Aynı zamanda, fonksiyonel denge için Berg Denge Ölçeği kullanılmıştır. Reaksiyon zamanı, cetvel düşme testi ile değerlendirilmiştir. Koordinasyon ise parmak burun, supinasyon pronasyon, diz topuk, Alt Ekstremit Motor Koordinasyon Testi, Soda Pop Koordinasyon Testi ile değerlendirilmiştir. Gruplara ilk ölçüm yapıldıktan 8 hafta sonra 2. ölçüm uygulanmıştır. **Bulgular:** Çalışma grubunda, Tek Ayak Duruş Testi ve Fonksiyonel Uzanma Testi ( $p=0,013$  ve  $p=0,000$ ) ile 360° Dönme Testi ve Dört Kare Adım Testi ( $p=0,000$  ve  $p=0,000$ ) açısından anlamlı grup içi farklılıklar bulundu. Çalışma grubunda parmak burun ( $p=0,032$ ), supinasyon-pronasyon ( $p=0,020$ ) ve Alt Ekstremit Motor Koordinasyon ( $p=0,003$ ) testlerinin sonuçları, anlamlı iyileşme gösterdi. **Sonuç:** Sonuçlar, BP'nin yaşlı insanlarda koordinasyonu ve dengeyi önemli ölçüde etkilediğini gösterdi. BP'nin, fiziksel bir aktivite olarak kullanımı yaşlılar için etkili olabilir.

**Anahtar Kelimeler:** Koordinasyon kompleksleri; egzersiz yapmak; kırılğan yaşlılar; perküsyon; postür denge

There is an inevitable aging tendency of the world's societies recently. According to the World Health Organization, the world population over the age of 60 will increase from approximately 12% to 22%

between 2015 and 2050.<sup>1</sup> Correspondingly, a study by Özmekte stated that Turkey had been a rapidly aging society with a life expectancy of 78 years in total, being 75.3 for men and 80.7 years for women.<sup>2</sup>

**Correspondence:** Nuray GİRGIN

Department of Physiotherapy and Rehabilitation, İstanbul Okan University Faculty of Health Sciences, İstanbul, TURKEY/TÜRKİYE

**E-mail:** nuray.girgin@okan.edu.tr



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As the world's population gets older, the assessment and treatment of the problems that arise with aging become increasingly important.<sup>3</sup> Degenerative changes in visual, vestibular, and somatosensory systems and aging affect the balance and coordination in elderly people. More specifically, the combination of physiological changes associated with aging and inactivity causes loss of functions, which accelerates the formation of noncontagious systemic diseases such as diabetes, hypertension, and cardiovascular diseases. Such devastating effects might likely be restored when continuous exercise and physical activity programs are appropriate and consistent.<sup>4-6</sup>

Physical activity for all elderly people is a top priority for maintaining lifelong health while developing protective approaches to avoid risks and provide appropriate services.<sup>7</sup> Music, dance, and movement have been implemented using various programs and strategies to address Turkish society's minimal exercise habits. Correspondingly, Tai-Chi (TC), yoga, pilates, hypnotherapy, and dance therapy have recently been used and studied in older adults.

Body music is an activity involving making sounds without any musical background or talent. Body music or body percussion (BP) is an emerging activity. It is probably considered the first music and dance in humanity's history, created with body sounds and vocals such as stepping, clicking fingers, and hand clapping. BP may reduce social interaction anxiety since it physically increases body awareness, movement control, and muscle power; cause increased coordination and balance, and improved mental processes including concentration, memory, and perception; and helps build psychosocial and equalitarian relations.<sup>8</sup> The therapeutic BP, applied as the BAPNE method, is a combination of dance and music therapy. The BAPNE method on mental processes has been studied worldwide by its promising effects on the associated functions. However, a lack of research on the physical impacts of the BAPNE method might have, which appears to be a gap in the literature.

BP can be applied to elderly people over 65 years of age, who are from different socioeconomic levels, at any place, and with varying combinations of

the groups, and various choreographies suitable for the intended purpose, and in a manner open to interdisciplinary and multidisciplinary approaches. By considering these, this study was conducted to ascertain the impact of using BP in elderly adults in Turkey as physical activity to improve their balance and coordination.

## MATERIAL AND METHODS

Medipol University Non-invasive Clinical Research Ethics Committee approved the study with the decision dated 26/04/2017 and numbered 163. Individuals were asked to read the protocol and sign the written informed consent form. Our study was conducted at the Physiotherapy Unit of Fatih Sultan Mehmet Training and Research Hospital, located in Istanbul, Turkey. This study was performed in line with the principles of the Declaration of Helsinki.

The study involved 50 adults who were recruited through convenience and snowball sampling methods. More specifically, announcements were primarily used to attract potential participants in the close communities to the Fatih Sultan Mehmet Training and Research Hospital. Additionally, efforts were put to identify any other referrals by reaching out to the patients in the hospital and the employees. Once the volunteers were determined, the following inclusion criteria were used to finalize the sample of participants; the absence of cognitive failure, being able to ambulate without requiring any device, having sufficient visual and hearing abilities, absence of orthopedic or neurological disorders, being 65 to 75 years of age and being independent in daily life activities. Individuals using a walking assistance device and with severe systemic or cardiovascular disorders that inhibit exercise were excluded from the study.

After participants' recruitment based on these criteria, intervention and control groups were created through random assignment of the participants. Both intervention and control groups consist of 25 participants. The associated assessments lasted for 45 minutes on average. Physical and medical data such as age, gender, body mass index (BMI), educational background, and the number of chronic diseases were recorded. Additionally, there were inquiries as to

whether individuals fell and how many times they fell. The intervention group was required to perform the BP activity properly. For BP activity, 10 different combinations of movements were created for balance and coordination. The details of the combinations of movements are presented in Figure 1 and Table 1. More specifically, the combination was performed each week, as illustrated in Figure 2. The combination involves 7 movements with the following order; tapping on the chest, hand snapping, hand clapping, tapping on the chest, hand snapping, tapping on the chest, and hand clapping. BP activity was applied three times a week and on consecutive days for a total duration of 45 minutes, including five minutes of warm-up exercises, five minutes of cool-down exercises, and 35 minutes of exercise. No exercise program was given to the control group. Individuals who participated in the BP activity sessions were asked to wear comfortable clothes and shoes. For ease of communication, the BP intervention group was divided into two subgroups, female and male, so that individuals can feel more comfortable in their interactions.

The participants' static balances were assessed using Romberg, Single Leg Stance Test, and Functional Reach Test. Specifically, the Single Leg Stance Test was used as an indicator of severe falls in elderly people whereas the Functional Reach Test was used as a clinical measurement of balance.<sup>9,10</sup> Moreover, dynamic balance was assessed using the 360-degree Turn Test and the Four Step Square Test. As suggested by Dite and Temple, in the 360-degree Turn Test, the participants were asked to turn in a complete 360-degree circle from the right-hand side or the left-hand side while the time was being recorded.<sup>11</sup> On the other hand, in the Four Step Square Test, the participants were asked to start and place their steps side by side and step to 2, 3, 4, and 1 starting from 1 and complete their steps at 4, 3, 2, and 1 again in a four-compartment area on a flat floor.

The Berg Balance Scale was used to measure functional balance. This scale comprises 14 items that all are scored between 0 (unable to do it) and 4 points (normal). Correspondingly, a score of 0-20 indicates an imbalance, 20-40 an acceptable balance, and 41-56 a good balance.<sup>12</sup>

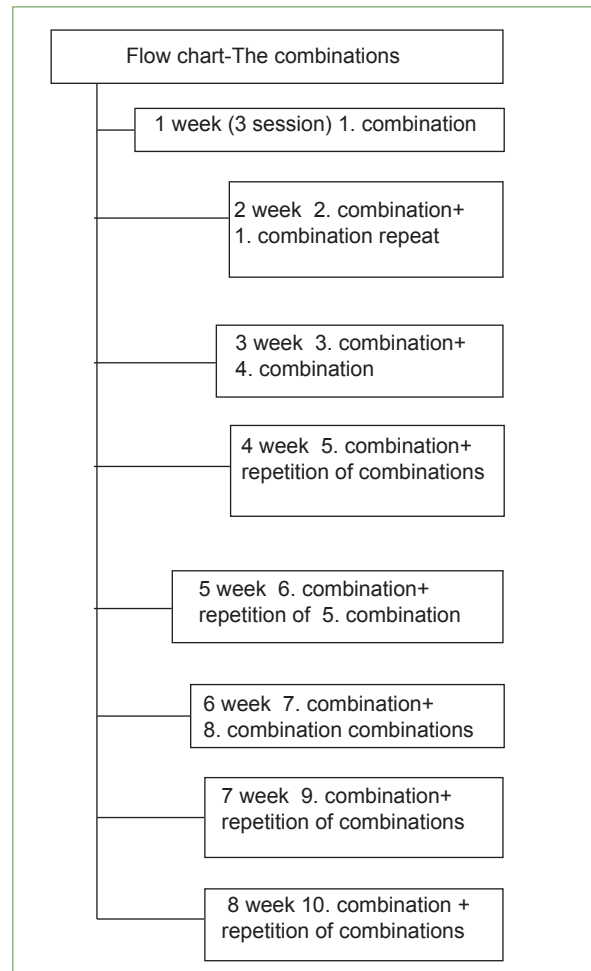


FIGURE 1: 8 weeks activity presentation.

TABLE 1: The movements and goals of the 1<sup>st</sup> combination.

Combination	Movements	Goal
	Tapping on the chest	Static balance
	Hand snapping	Hand-eye coordination
	Hand clapping	
	Tapping on the chest	
	Hand sapping	
	Tapping on the chest	
	Hand clapping	

Coordination of upper and lower extremities was measured using the finger to nose, supination-pronation, knee heel, Lower Extremity Motor Coordination Test, Soda Pop Coordination Test. Additionally, the ruler drop test was used for calculating reaction time.<sup>13</sup> More specifically, the supination-pronation in-

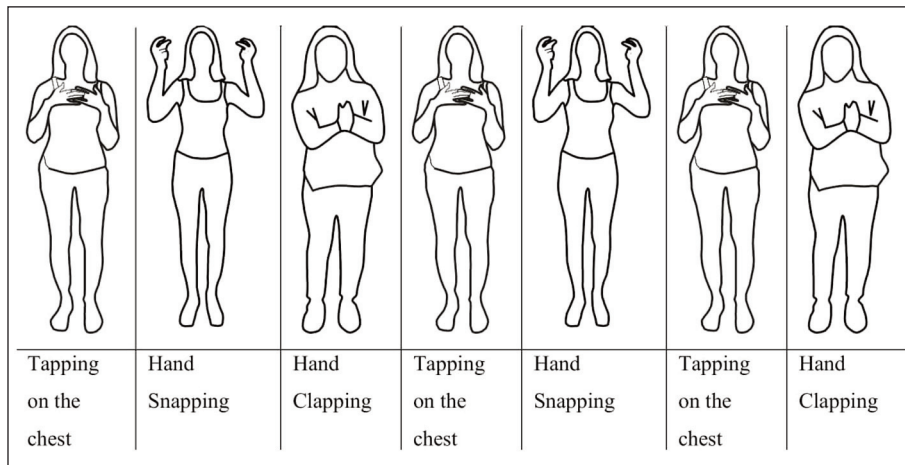


FIGURE 2: Movement combination 1.

volves asking the participants to sit in front of a desk, put their hands on the surface, and supinate and pronate their arms starting from the pronation, repeating a total of 10 times. On the other hand, in Lower Extremity Motor Coordination Test, participants are asked to move their hips to touch their hal-lux across two different targets (distal and proximal) while sitting for 20 seconds.<sup>14</sup> Lastly, as the name implies, the Soda Pop Coordination Test involves 3 soda pop cans placed in circles on a straight line. The participants are expected to turn each can upside down and put the can in the next circle. The test continues until the first can returns to its initial position. It should be noted that the participants of our study are asked to use their dominant hand, and the whole process was completed twice and measured each time.<sup>15</sup> All the tests mentioned above were administered in the clinic at the beginning and end of the study.

STATISTICAL ANALYSIS

Statistical analysis was performed using the IBM SPSS Statistics 22 software package (IBM SPSS, Turkey). While the study data were being assessed, fit to the normal distribution of parameters was examined using the Shapiro-Wilk test. Descriptive statistical methods (e.g., mean, standard deviation, and frequency) and Student t-test in two-group comparisons of parameters with a normal distribution were used. For the parameters that do not show a normal distribution, Mann-Whitney U test was used. Additionally, paired sample

t-test was used for intra-group comparisons of quantitative data showing normal distribution. In contrast, the Wilcoxon signed-rank test was used for intra-group comparisons of parameters not showing normal distribution. Fisher’s exact test and chi-squared test were used for comparing the categorical data. Significance was assessed at p<0.05 level.

RESULTS

The demographic, anthropometric, and other characteristics of both of the groups are presented in Table 2. Based on the findings, 26 (52%) male and 24 (48%) female individuals participated in the study with a mean age of 69.94±3.05. The difference between the average BMIs of the intervention and control groups was not statistically significant. Similarly, no statistically significant differences were observed between groups in terms of smoking, workout habits, and the ratio of falls.

No statistically significant difference was found between the groups in terms of Romberg, Single Leg Stance Test, 360-degree Turn Test, and Functional Reach, reaction time, and Berg Balance Scale values regarding the first measurement of balance. At the first measurement between groups, although the intervention group’s Four Step Square Test value was found to be significantly lower than that of the control group (9.19±2.04 vs. 10.49±2.19, p=0.035), improvement of the intervention group in terms of the last measurement values was significant (7.49±2.37

vs.  $9.97 \pm 2.73$ ,  $p=0.001$ ). Additionally, the intra-group change in the Four Square Step Test for intervention group was also found to be significant ( $p=0.000$ ).

During intra-group assessments, a significant increase was observed in the Single Leg Stance Test and Functional Reach values of the intervention group ( $p=0.013$  and  $p=0.000$ ). Also, a significant decrease was found in the intervention group in the 360-degree Turn Test and Four Step Square Test ( $p=0.000$  and  $p=0.000$ ). A summary of the balance parameters is presented in Table 3.

At the first measurement, there was no significant difference between the intervention and the control group regarding coordination values. The outcomes of the finger to nose ( $p=0.032$ ), supination-pronation ( $p=0.020$ ), and Lower Extremity Motor Coordination ( $p=0.003$ ) tests significantly improved in the intervention group compared to the results of the control group. Within the group, the outcomes of the finger-to-nose ( $p=0.000$ ), supination-pronation ( $p=0.000$ ), knee-heel ( $p=0.001$ ), Lower Extremity Motor Coordination ( $p=0.038$ ), and Soda Pop Coordination ( $p=0.001$ ) tests improved significantly in the intervention, and there was only a significant decrease in the knee-heel value of the control group ( $p=0.001$ ). The results of the coordination evaluations can be found in Table 4.

## DISCUSSION

The present study has shown that BP has significant effects on balance and, notably, coordination in elderly people.

The systematic review and meta-analysis by Rand et al. on the reliability of balance in the elderly, exercise was screened in 453 individuals and 9 study groups, TC in 468 individuals and 5 study groups, and multifactorial interventions in 1,233 individuals and 10 study groups. The screening revealed that the interventions showed considerable differences in terms of type, intensity, and duration. A moderately significant effect was found for TC, whereas other studies showed low significant effects.<sup>16</sup> BP, similar to TC, may be composed of many different variations depending on slow or fast movements, postural positions, and arm involvement, depending on the field and how the researcher conducting the study wishes to achieve the improvement in participants. Our study included 10 movement combinations, and we focused on the development of static-dynamic balance and coordination. We believed that repeating movement combinations and applying these combinations in different choreographies led to significant lower- and upper-extremity coordination improvements. Improvements in static balance were also attained as postural control ability.

**TABLE 2:** Comparison of demographic, anthropometric, and other characteristics of the groups.

		Intervention Group Mean±SD (Minimum-Maximum)	Control Group Mean±SD (Minimum-Maximum)	Total Mean±SD (Minimum-Maximum)	p value
Height (cm)		1.66±0.07 (1.55-1.82)	1.62±0.08 (1.50-1.75)	1.64±0.08 (1.50-1.82)	-
Weight (kg)		73.24±11.16 (58-95)	72.24±9.53 (59-95)	72.74±10.38 (58-95)	-
Age (years)		70.12±2.95 (65-75)	69.76±3.21 (65-75)	69.94±3.05 (65-75)	<sup>1</sup> 0.681
Body mass index (kg/m <sup>2</sup> )		26.60±03.59 (20.20-34.90)	27.52±03.19 (20.80-34.40)	27.06±03.39 (20.20-34.90)	<sup>1</sup> 0.340
Smoking n (%)	Yes	2 (8)	4 (16)	6 (12)	<sup>3</sup> 0.667
	No	23 (92)	21 (84)	44 (88)	
Exercise n (%)	Yes	14 (56)	12 (48)	26 (52)	<sup>2</sup> 0.777
	No	11 (44)	13 (52)	24 (48)	
Fall n (%)	Yes	0 (0)	2 (8)	2 (4)	<sup>3</sup> 0.490
	No	25 (100)	23 (92)	48 (96)	

SD: Standard deviation; <sup>1</sup>Student t-test; <sup>2</sup>Chi-square test; <sup>3</sup>Fisher's exact test; \* $p<0.05$ .

**TABLE 3:** Evaluation of balance parameters within and between groups.

		Intervention Group	Control Group	p value
		Mean±SD	Mean±SD	
Romberg test (sec) (median)	FM	30±0 (30)	30±0 (30)	<sup>1a</sup> 1.000
	SM-Measurement at the end of 2 months	30±0 (30)	30±0 (30)	<sup>1a</sup> 1.000
	FM-SM p <sup>2a</sup>	1.000	1.000	
Single Leg Stance Test (sec) (median)	FM	22.13±9.68 (28.80)	18.89±8.92 (17.40)	<sup>1a</sup> 0.225
	SM	25.89±7.29 (30)	22.22±9.10 (30)	<sup>1a</sup> 0.196
	FM-SM p <sup>2a</sup>	0.013*	0.064	
360- Degree Turn Test (sec) (median)	FM	2.84±0.83	2.86±0.78	<sup>1a</sup> 0.935
	SM	2.20±0.64	2.57±0.74	<sup>1a</sup> 0.066
	FM-SM p <sup>1a</sup>	0.000*	0.111	
Four Step Square Test (sec) (median)	FM	9.19±2.04	10.49±2.19	<sup>1b</sup> 0.035*
	SM	7.49±2.37	9.97±2.73	<sup>1b</sup> 0.001*
	FM-SM p <sup>2b</sup>	0.000*	0.251	
Functional Reach Test (centimeter) (median)	FM	31.40±7.03	31.42±5.36	<sup>1b</sup> 0.991
	SM	35.30±6.72	32.54±3.90	<sup>1b</sup> 0.082
	FM-SM p <sup>2b</sup>	0.000*	0.190	
Reaction time (sec)	FM	0.03±0.01	0.03±0	<sup>1b</sup> 0.386
	SM	0.03±0.01	0.03±0	<sup>1b</sup> 0.176
	FM-SM p <sup>2b</sup>	0.081	0.159	
Berg Balance Scale (point)	FM	55.36±1.29	55.28±0.98	<sup>1b</sup> 0.806
	SM	55.64±1.04	55.60±0.65	<sup>1b</sup> 0.871
	FM-SM p <sup>2b</sup>	0.129	0.119	

SD: Standard deviation; FM: First measurement; SM: Subsequent measurement; <sup>1a</sup>Mann-Whitney U test; <sup>1b</sup>Student t-test; <sup>2a</sup>Wilcoxon sign Test; <sup>2b</sup>Paired sample's t-test; \*p<0.05.

**TABLE 4:** Assessment of coordination parameters within and between groups.

		Intervention Group	Control Group	p1
		Mean±SD	Mean±SD	
Finger to nose (sec./10 repetitions)	FM	6.69±1.27	7.02±1.06	0.324
	SM-Measurement at the end of 2 months	5.77±1.30	6.59±1.33	<b>0.032*</b>
	FM-SM p <sup>2</sup>	<b>0.000*</b>	0.086	
Supination-pronation (sec./10 repetitions)	FM	6.45±1.08	6.77±1.14	0.317
	SM	5.54±1.17	6.44±1.44	0.020*
	FM-SM p <sup>2</sup>	0.000*	0.201	
Knee-heel (sec./10 repetitions)	FM	9.78±2.38	9.87±1.47	0.869
	SM	8.32±1.68	8.99±1.58	0.150
	FM-SM p <sup>2</sup>	<b>0.001*</b>	<b>0.001*</b>	
Lower Extremity Motor Coordination Test (The number of repetitions/20 sec.)	FM	29.64±6.53	27.88±4.68	0.279
	SM	31.92±5.57	27.56±4.30	0.003*
	FM-SM p <sup>2</sup>	<b>0.038*</b>	0.649	
Soda Pop Coordination Test (sec)	FM	13.46±3.18	14.09±2.99	0.471
	SM	11.59±2.83	13.03±3.09	0.094
	FM-SM p <sup>2</sup>	<b>0.001*</b>	0.074	

SD: Standard deviation; FM: First measurement; SM: Subsequent measurement; <sup>1</sup>Student t-test; <sup>2</sup>Paired sample's t-test; \*p<0.05.

Studies emphasizing that dance activity is important as physical activity in the elderly are increasing.<sup>17</sup> Dance therapy is associated with the prevention of cognitive decline, improvement in balance, and decreasing risk of falling.<sup>18</sup> Dance therapy and BP are based on similar foundations such as rhythm, serial movements, concentration, and coordination. Both activities involve group work. It may be thought that BP is more likely to be performed in our culture than dance activity.

Video games are also used as an alternative strategy to encourage physical activity in the elderly.<sup>19,20</sup> In a study, cyber golf training was applied to 20 elderly people in a 2-week program as a cheap and convenient activity. The researchers assessed the risk of falling using the Timed Up and Go Test and the static balance using the Functional Reach and Single Leg Stance Test. The results indicated that the elderly showed significant improvements in terms of static balance.<sup>21</sup> On the other hand, according to the results of our study, there was no difference in values of the Single Leg Stance Test and the Functional Reach Test, which are determinants of static balance, compared to the control group. Additionally, there were significant improvements in the Functional Reach and the Single Leg Stance Test in the intervention group.

There was no significant difference between the groups in the last measurement at 360-degree Turn, which is one indicator of dynamic balance. Although the Four Step Square value was significantly higher in the control group in the first measurement, the significant decrease in the final measurement was higher in the intervention group. The intervention group showed significant improvements in 360-degree Turn and Four Step Square values. Therefore, BP may be effective in improving the dynamic balance.

In the present study, the Berg Balance Scale was used to evaluate the functional balance, but no difference was observed in the groups. The fact that the first measurement values were high and that the 65-75 age range was selected as the population might have led to this result. Falls were experienced in 2 of 50 persons and only once among our participants.

Hand-eye coordination is vital in performing daily life activities.<sup>22</sup> A study investigating the effect of TC on hand-eye coordination found positive developments.<sup>23</sup> Like TC, BP involves hand-eye and lower-extremity coordination. In our study, significant improvements were obtained in all of the upper and lower extremities' coordination parameters. It can be perceived that combinations of movement, involving repetitive and regular movements, increase control with time-dependent acceleration and increase coordination with time-dependent deceleration. The movements related to postural and arm use are standard in TC. BP, however, involves limitless variations designed for the purpose.

Reaction time can be defined as the period between the introduction of the stimulus and the individual's response to that stimulus.<sup>24</sup> Because of the lack of routine repetitions and sudden changes made in every combination to maintain the attention in the group, a significant reduction was estimated in the reaction time of the study group; yet, expected results were not achieved.

Restrictions of the elderly to participate in physical activity might lack studies on their wishes and needs. According to the systematic and meta-synthesis results of 14 studies covering non-clinical physical activity interventions in the elderly who live independently and are older than 65 years of age, the perceived values related to physical activity include main themes such as the fun side of the activity, the effect of the experience, and presentation of the content. In our study, the fact that the intervention group consisted of individuals who knew each other and communicated with one another was very effective in maintaining the activity and motivating each other.<sup>25</sup>

BP is considered an art activity in Turkey. In the world, however, the BAPNE method is applied for therapeutic purposes. One study investigated the effects of music and movement programs on the cognitive, motor, social, and psychological conditions in the elderly using the BAPNE method.<sup>26</sup> Twenty retirees, twelve females and eight males, at the ages of 61 to 80, were included in the study. Improvements were achieved in activities requiring cognitive effort and body coordination.

A study investigating the effects of group-based exercises on elderly people's balance grouped the participants in groups of a maximum of 5 people and implemented the exercises based on their difficulty levels.<sup>27</sup> In our study, the intervention group was divided into female (n=12) and male (n=13) participants. The purpose of structuring the groups as female and male groups was to ensure that they felt more comfortable and expressed themselves better. During the exercises, individuals were able to see one another by forming a circle for the activity purposes. They motivated each other and tried to perform the movements more carefully. The fact that the movements are designed to increase balance and coordination targeted for the elderly, and the ease of adjusting BP for that purpose made it possible to create target-driven studies. Additionally, similar to the study mentioned above, the combinations were planned from easy to difficult, increasing the participants' curiosity and interest. We focused more on the neuropsychological foundations described in studies using the BAPNE method. We evaluated the effects of BP on balance and coordination, especially during the aging process, by starting with the brain that struggles to improve in terms of movement with activities shaped and based on that purpose.

The limitations of our study included failure to assess daily life activities and the quality of life. Such an evaluation would be informative to see the partic-

ipants' involvement with the community as an indicator of the BP's effects.

## CONCLUSION

In conclusion, BP has had positive effects on balance and coordination in the elderly. Therefore, it can be used as an alternative method to support and improve physical activity in the older population.

### Source of Finance

*During this study, no financial or spiritual support was received neither from any pharmaceutical company that has a direct connection with the research subject, nor from a company that provides or produces medical instruments and materials which may negatively affect the evaluation process of this study.*

### Conflict of Interest

*No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.*

### Authorship Contributions

**Idea/Concept:** Nuray Girgin, **Design:** Nuray Girgin, Zeliha Candan Algun; **Control/Supervision:** Nuray Girgin, Zeliha Candan Algun; **Data Collection and/or Processing:** Nuray Girgin, **Analysis and/or Interpretation:** Nuray Girgin, **Literature Review:** Nuray Girgin, **Writing the Article:** Nuray Girgin, **Critical Review:** Nuray Girgin, Zeliha Candan Algun.

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