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An Analysis of the Relationship between Cognitive Flexibility and Anger in Geriatric Individuals

Analiza związku między giętkością poznawczą a złością u osób starszych

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Abstract

Introduction. In geriatrics, cognitive flexibility, which is known to be effective in individuals' being patient with events, is the ability to activate one's cognition in the face of sudden unexpected situations by processing. Being cognitively positive or negative affects geriatric individuals' cognitive flexibility levels. It is important to examine the anger levels of geriatric individuals in the evaluation of their cognitive flexibility.
Aim. This study aims to examine the relationship between cognitive flexibility and anger in geriatric individuals.
Material and Methods. The current study was held in a Nursing Home in Central Turkey. The purposive sampling method was used in sample selection. The present research is designed as a descriptive study.
Results. There are statistically significant and negative correlations between the CFS and State-Anger, Anger/In, and Anger/Out. Furthermore, there is a statistically significant and positive correlation between the CFS and Anger/Control.
Conclusions. It is seen that the daily forgetfulness level and the mean scores of Anger/In and Anger/Out, which are state-anger and trait-anger styles, increased, while the mean scores of Anger/Control and Cognitive Flexibility decreased. **(JNNN 2023;12(1):9–16)**
Key Words: anger, cognitive flexibility, geriatric individuals, nursing

Streszczenie

Wstęp. W geriatrii giętkość poznawcza, o której wiadomo, że skutecznie pomaga jednostkom w zachowaniu cierpliwości wobec zdarzeń, jest zdolnością do aktywacji poznawczej w obliczu nagłych, nieoczekiwanych sytuacji poprzez ich przetwarzanie. Bycie pozytywnym lub negatywnym poznawczo wpływa na poziom giętkości poznawczej osób starszych. Ważne jest, aby zbadać poziom gniewu u osób starszych w ocenie ich giętkości poznawczej.
Cel. Celem pracy jest zbadanie związku między giętkością poznawczą a złością u osób starszych.
Materiał i metody. Badanie przeprowadzono w domu opieki w środkowej Turcji. W doborze próby zastosowano metodę doboru celowego. Niniejsze badanie zostało zaprojektowane jako badanie opisowe.
Wyniki. Istnieją statystycznie istotne i ujemne korelacje pomiędzy CFS a State Anger, Anger/In i Anger/Out. Ponadto istnieje statystycznie istotna i dodatnia korelacja między CFS a Anger/Control.
Wnioski. Widać, że pamięć krótkotrwała uległa pogorszeniu oraz to, że średnie wyniki Anger/In i Anger/Out, czyli stylów state-anger i trait-anger wzrosły, spadły natomiast średnie wyniki Anger/Control i Cognitive Flexibility. **(PNN 2023;12(1):9–16)**
Słowa kluczowe: złość, giętkość poznawcza, osoba starsza, pielęgniarstwo

Introduction

Aging is a natural process seen in all living things, where physical functions decrease, cognitive abilities begin to weaken and it is the last stage of the normal life process [1,2]. Although the number of the elderly population is in increasing trend all over the world, it has been observed that the population ratio of elderly individuals in our country is 9.7%, above the world average of the elderly population [3–5]. One of the serious problems that make it difficult for geriatric individuals to adapt to life, among the changes that occur in geriatric individuals, whose numbers are increasing day by day, is the changes in the functions in the cognitive areas [2,5]. The frontal lobe performs the skills related to cognitive areas in individuals. Neurological changes due to aging also affect this area. Of course, every individual is different and even if they are the same age, they do not live in the same age [5,6]. It is known that cognitive changes that occur with aging may have consequences such as exerting more cognitive effort in learning new information or lowering the threshold for perseverance (patience) for events [6]. Cognitive flexibility, which is known to be effective in the patience of older individuals to events, is the ability of individuals to process their cognition and activate it in the face of unexpected and sudden situations [7–9]. As can be seen, individuals may encounter unexpected situations in their lives. In similar situations, it is known that geriatric individuals should be open to changes and have the capacity to find solutions to the problems they encounter in order to continue their life in harmony. When the literature is examined in terms of these requirements, the importance of the concept of cognitive flexibility is emphasized. Considering that people, especially geriatric individuals, being cognitively positive or negative has very important effects on their cognitive flexibility levels, it can be interpreted that people who are cognitively flexible are also positive and more adaptive in their relationships. The anger feelings of individuals with positive cognition consist of much more appropriate reactions, while individuals with negative cognition tend to show their anger more with dysfunctional behaviors [9,10]. In addition, attention and memory problems that develop due to aging can create more "seeing evil" thoughts in individuals' attitudes toward events that cause anger [6,10]. The increase in chronic diseases, the emergence of neurological or psychiatric diseases, physical disabilities, and daily forgetfulness due to these diseases cause geriatric individuals to be more sensitive to anger-inducing situations [11–13]. Individuals who can say "I usually try another way in times of anger" are also said to have high psychological flexibility [14]. In fact, some studies have presented that cognitive behavioral therapy (CBT) methods applied to increase cognitive flexibility also facilitate anger management in individuals [15,16]. The cognitive flexibility ability that individuals acquire in their early ages (3–5 years) is a skill that guides individuals and manages their behaviors for the rest of their lives [17]. In a study on cognitive flexibility, it has been stated that moderately impaired cognitive abilities have impacts on anger toward other people and the development of harmful behaviors [18]. In the literature review, although the cognitive flexibility and anger of geriatric individuals were examined separately, no study was found in which cognitive flexibility and anger were investigated together in geriatric individuals.

The aim of this study is to determine the relationship between cognitive flexibility and anger in geriatric individuals.

Material and Methods

This research was carried out in the form of a descriptive and cross-sectional study.

Research Design and Participants

This study was carried out in a Nursing Home in Central Turkey. The purposive sampling method was used in sample selection. The sample of the study consisted of 66 geriatric individuals. The inclusion and exclusion criteria of the study are listed below.

Inclusion Criteria:

1. Being 65 years old or older.
2. Living in the nursing home where the study was conducted.
3. Having no speech, communication, or language problems.
4. Volunteering to participate in the study.

Exclusion Criteria:

1. Receiving a cognitive intervention.
2. Being younger than 65.
3. Having problems in communication (those who could not speak Turkish, those who had communication-language problems, and those who had impaired speech).
4. Not volunteering to participate in the study.

Data Collection Method and Tools

We made our data in institutions working as Community Health Centers in the center of Turkey. The research was concluded with the collection of data on 10.01.2022/22.04.2022. Geriatric individuals who applied to these institutions formed the universe of the

study. Individuals who volunteered and accepted the Declaration of Helsinki were selected as the sample.

The Personal Information Form, Cognitive Flexibility Scale (CFS), and State-Trait Anger Scale (STAS) were used in data collection. Information about data collection tools is presented below.

Personal Information Form

It is an information form in which the personal characteristics of geriatric individuals such as age, gender, marital status, chronic diseases, smoking, alcohol use, and whether they have psychiatric or neurological diseases or not.

State-Trait Anger Scale (STAS)

Anger expression levels of the participants were measured by applying the "State-Trait Anger Scale (STAS)". This scale, which is frequently used in the literature, was developed and brought to the literature by Spielberger et al. The first 10 questions of this scale are those covering the "State-Anger". Additionally, there are 24 questions in the "Trait-Anger". The Trait-Anger has three subscales: Anger/In, Anger/Out, and Anger/Control. The scale is in the form of a four-point Likert-type questionnaire consisting of 34 questions in total. (1 — Not at all, 2 — A little, 3 — Quite a lot, 4 — Totally) [19].

While State Anger expresses how people feel in general and how much anger they experience, Trait Anger expresses how often people behave in the ways mentioned. The subscale of Anger/Out indicates the level of expression, the subscale of Anger/In indicates the level of keeping the felt anger inside by suppressing, and the subscale of Anger/Control indicates the state of controlling anger with defenses such as rationalization, denial, and suppression [20].

Cognitive Flexibility Scale (CFS)

The cognitive Flexibility Scale is a one-dimensional scale consisting of 12 items developed by Martin and Rubin (1995). The CFS 1 is a 6-point Likert-type measurement tool, which is answered in the form of "1=strongly disagree" and "6=strongly agree". In this study, the internal consistency coefficient (α) of the scale was found to be .80, and the test-retest reliability coefficient was found to be .83. The findings that the mean score of CFS showed a statistically significant and positive relationship between the mean scores of communication skills and efficacy beliefs in behaviors related to communication skills, and the findings that people make friends positively as the level of cognitive flexibility increases were also confirmed as evidence for the criterion-related validity of CFS. The scores that can be obtained from the scale vary between 10 and 60 points. Items 2, 3, 6, and 10 are reverse-scored on the scale. High scores obtained from the scale indicate a high level of cognitive flexibility [21,22].

Statistical Analysis of the Data

Statistical Package for the Social Sciences (SPPS) 25.0 IBM program was used to analyze the data. Before starting the analysis, it was determined that the data showed normal distribution with the help of the Kolmogorov–Smirnov test. In the analysis of the data, to examine the descriptive characteristics of geriatric individuals, percentages were investigated; to analyze the scales according to the cut-off points and to compare the effective factors according to the cut-off points of the scales, Chi-square analysis and Fisher's Exact test were used.

Ethical Principals of the Research

Before starting the research, necessary legal permissions were obtained from the Ethics Committee of a university, ethical no:01-217. Informed consent forms were obtained from geriatric individuals about the study in line with the Declaration of Helsinki. Individuals who volunteered to participate in the study were included in the study after their informed consent forms were obtained.

Results

In the study, it is seen that 68.2% of the participants are males, the average age of the participants is 75.03, 47.0% of them are primary school graduates, more than half of them are married, almost all of them have a child/children, 84.8% of them have moderate income levels, and all of them have chronic diseases, 40.9% of them have physical disabilities, and 83.3% of them have daily forgetfulness problems (Table 1).

It was determined that the mean scores of the State-Anger, Anger/In, and Anger/Out of geriatric individuals participating in the study were higher than the mean score of the Anger/Control, so the participants could not control their anger and experienced state-anger. It was determined that the CFS mean score of geriatric individuals participating in the study was below the moderate level (Table 2).

Table 1. Data on the descriptive characteristics of geriatric individuals (N=66)

Variable	N	%
1	2	3
Age (Mean±SD)		75.03 ±6.26
Gender		
Women	21	31.8
Men	45	68.2
Education		
Illiterate	7	10.6
Literate	13	19.7
Primary School	31	47.0
Middle School	5	7.6
High School or Higher	10	15.1
Marital status		
Single	27	40.9
Married	39	59.1
Having a Child/Children		
Present	61	92.4
Absent	5	7.6
Income Level		
Low	10	15.2
Moderate	56	84.8
Having chronic diseases		
Yes	66	100.0
Physical Disability		
Present	27	40.9
Absent	39	59.1
Daily Forgetfulness		
Present	55	83.3
Absent	11	16.7

Table 2. Mean scores of the CFS, STAS, and STAS's subscales (N=66)

Scales and Subscales	Mean±SD	Min-Max
STAS		
State-Anger	29.71±7.91	14–37
Anger/In	22.06±4.94	11–27
Anger/Out	25.62±6.59	9–32
Anger/Control	16.46±6.84	10–32
CFS	32.40±4.75	28–52

Table 3. Comparison of the mean scores by the demographic characteristic (N=66)

Characteristics	STAS (Mean±SD)				CFS (Mean±SD)
	State-Anger	Trait-Anger			
		Anger/In	Anger/Out	Anger/Control	
1	2	3	4	5	6
Gender					
Women	30.71±7.03	22.19±4.15	26.66±5.42	15.14±6.59	32.09±4.22
Men	29.24±8.32	22.00±5.31	25.13±7.07	17.08±6.93	32.55±5.02
t and p values	0.700/0.487	0.145/0.885	0.878/0.383	–1.078/0.285	0.717/–0.364
Marital Status					
Single	30.17±7.42	22.23±4.30	26.17±6.36	15.79±6.61	32.20±4.33
Married	29.03±8.67	21.81±5.82	24.81±6.95	17.44±7.16	32.70±5.38
t and p values	0.573/0.568	0.334/0.740	0.824/0.413	–0.963/0.339	–0.416/0.679
Having a Child/Children					
Present	29.68±7.93	21.96±4.91	25.60±6.70	16.45±6.94	32.49±4.73
Absent	30.0±8.54	23.20±5.76	25.80±5.63	16.60±6.06	31.40±5.50
t and p values	–0.084/0.933	0.533/0.596	–0.063/0.950	–0.044/0.965	0.490/0.626
Income level					
Low	30.60±8.39	22.90±5.08	24.70±7.64	16.90±7.07	32.80±4.87
Moderate	29.55±7.89	21.91±4.94	25.78±6.45	16.39±6.86	32.33±4.77
t and p values	0.383/0.703	0.580/0.564	–0.477/0.635	0.214/0.831	0.280/0.780

Table 3. Continued

1	2	3	4	5	6
Physical Disability					
Present	29.29±9.05	21.11±5.31	25.00±6.41	17.62±7.43	33.03±4.91
Absent	30.00±7.13	22.71±4.62	26.05±6.76	15.66±6.37	31.97±4.66
t and p values	–0.353/0.726	–1.306/0.196	–0.634/0.529	1.149/0.255	0.891/0.377
Daily Forgetfulness					
Present	31.67±6.09	23.23±3.82	27.27±5.01	14.58±5.15	31.40±3.97
Absent	19.90±8.93	16.18±5.84	17.36±7.54	25.90±6.56	37.45±5.29
t and p values	5.380/<0.001	5.080/<0.001	5.467/<0.001	–6.351/<0.001	–4.351/<0.001

No statistically significant relationships were found between gender, marital status, having a child/children, income level, physical disability, and the mean scores of the scales. However, statistically significant and negative correlations were found between the participants' daily forgetfulness and the mean scores of the CFS and the STAS's subscale of Anger/Control. Furthermore, a statistically significant and positive correlation was found between the mean scores of the STAS's subscales of Anger/In and Anger/Out (Table 3).

There are statistically significant and negative correlations between the CFS and State-Anger, Anger/In, and Anger/Out. Furthermore, there is a statistically significant and positive correlation between the CFS and Anger/Control. In addition, there are statistically significant and negative correlations between the Anger/Control and State-Anger, Anger/In, and Anger/Out (Table 4).

Table 4. Correlations between the STAS and CFS (N=66)

Scales			STAS				CFS
			State Anger	Trait-Anger			
				Anger /In	Anger /Out	Anger /Control	
STAS Trait-Anger	State-Anger	r	1				
		p					
	Anger/In	r	0.934*	1			
		p	<0.001				
	Anger/Out	r	0.947*	0.912*	1		
		p	<0.001	<0.001			
	Anger/Control	r	–0.954*	–0.916*	–0.936*	1	
		p	<0.001	<0.001	<0.001		
	CFS	r	–0.835*	–0.862*	–0.831*	0.840*	1
		p	<0.001	<0.001	<0.001	<0.001	

* Correlation is significant at the 0.01 level (2-tailed)

Discussion

The present study was conducted to examine the relationships between the cognitive flexibility levels and anger of geriatric individuals in a nursing home.

In the current study, there were no statistically significant relationships between gender, marital status, having child/children, income level, physical disability and the mean scores of the scales. However, a statistically significant and negative correlation was found between the participants' daily forgetfulness and the mean score of the CFS. In some studies, similar results were also obtained, and according to this, the mean scores of the CFS of geriatric individuals participating in the studies were below the moderate level, and the mean scores of the State-Anger, Anger/In, and Anger/Out were higher than the mean scores of the Anger/Control; therefore, it was determined that the participants could not control their anger and experienced state-anger [23–25]. Furthermore, in this study, it was determined that the mean scores of the CFS and Anger/control of geriatric individuals were below the moderate level, while their State-Anger mean scores were high. In studies conducted on different sample groups in the literature, statistically significant, negative, and weak correlations were found between the mean scores of the State-Anger and CFS, and statistically significant, negative, and moderate correlations between Anger/Out and Anger/Control were also determined [26,27]. Accordingly, as the cognitive flexibility levels increase, the state anger levels of the participants decrease, and as the Anger/Out levels increase, there are decreases in Anger/Control behaviors [26,27].

Unlike the results of our study, Ekinci et al.'s study [28], in which they examined the relationship between the STAS and gender, showed that the level of Anger/Out differed according to gender; however, it was

observed that the incidences of Anger/Out were more common in men than in women [28–31]. Additionally, when the foreign studies were examined, it was seen that there were no statistically significant differences between genders in the frequencies and expressions of anger, similar to the current study's results [32]. This suggests that the difference between cultures may be due to the importance of social acceptance and expectation in expressing anger. Although there is no statistically significant correlation between the STAS and gender in the current study, the females have a higher mean score on the STAS than the men. It is thought that this situation might result from the fact that although women have a role to keep and unite the individuals in the family environment until they get old and come to the nursing home, they may have reflected their anger in response to their family not keeping them together with the same devotion and bringing them to the nursing home. When Akdoğan's study was analyzed from a different perspective, it was found that participants with masculine gender roles expressed more anger than participants with feminine and androgynous gender roles, and drew attention to the importance of having different gender roles in expressing anger [33]. According to the results of a study conducted in Korea, the anger levels and coping styles of elderly female individuals were not found much different from other age groups [34]. In a study conducted in Taylan in 2019, it was reported that female geriatric individuals follow a more negative process cognitively than male geriatric individuals [35]. Moreover, in the same study, it was presented that while the language skills of the females were negatively affected, their visual construction skills increased [35]. This seems to explain the reason for the anger that will arise due to the decrease in language skills while the visual construction skills of women increase. Although the opinion that women are more open than men in expressing their emotions is dominant, the situation can be different when it comes to "anger", which is seen as a masculine emotion. Although some of the findings do not coincide with the present study's results, there are different results in the literature between gender, STAS, and CFS.

Woodward, in his study published in 2003, mentioned that with the prolongation of life expectancy, the aging period also prolongs and that the elderly with high anger levels emerge among the cognitive problems [36]. He stated that this elderly group enables American society to meet a "new" aging process [36]. In another study conducted in China in 2020, it was stated that anxiety and depression, which impair cognitive processes, increase impulsivity and as a result, they reveal anger [37].

According to the present study's results, it can be said that while the mean score of the CFS increases, the mean score of the STAS decreases. It makes us think that this situation may result from the fact that geriatric individuals living in nursing homes experience forgetfulness due to their age-related cognitive declines and that they are constantly angry because of this forgetfulness and reflect their anger both to themselves and to outsiders. Additionally, the results in the previous studies on the changes in the angry mood and thought content of geriatric individuals may cause forgetfulness by negatively affecting the memory performance of the individuals at the cognitive level; therefore, the previous studies support the current study's results [38–40]. In addition, some studies in the literature reported that approximately 40% of geriatric individuals staying in nursing homes had depression [41–46]. It is thought that the nursing home residents in the current study population may be faced with this risk, and the feeling of anger may have increased due to the slowing of the cognitive processes because of depression and the decrease in serotonin and acetylcholine hormone levels. Although the current study did not investigate the participants' anger states and hormone levels that affect their memories and emotions, it was presented that anger and cognitive flexibility were almost equally significant in the etiological factors examined separately. Theoretically, it is said that problems in frontal lobe functions with aging are an important cause of both changes in emotional expressions due to depression and cognitive problems [39,43].

Conclusions

In geriatric individuals with high daily forgetfulness, while the mean scores of the STAS's subscales of Anger/In and Anger/Out increase, the mean scores of the CFS and the STAS's subscale of Anger/Control decrease.

Implications for Nursing Practice

Detection of cognitive flexibility level is one of the interventions that should be considered in nursing care for geriatrics to increase quality of life and prevent serious anger disorder among geriatric individuals. Healthcare professionals (especially psychiatrist and psychiatric nurse) caring for geriatric individuals should be aware of the scope of the relationship between cognitive flexibility and anger in geriatric individual and examine how it may affect the geriatrics in their care. Providing geriatric clinicians with conveniences for geriatric individuals to state their experiences can help their geriatric individuals understand the effects and consequences of anger. For this, other geriatric clinicians should receive support and counseling from psychiatric nurses, and healthcare professionals should adopt a multidisciplinary approach.

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