



Relations among family communication, cognitive flexibility, and happiness in Turkish adults: a longitudinal mediation model

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Abstract

Family relationships and family life are important protective factors for psychological health. Establishing healthy communication between members of a family is important for the happiness of individuals. There are several cross-sectional findings regarding family communication in the literature. A longitudinal design was used to examine the mediating effect of cognitive flexibility in the relationship between family communication and happiness, taking into consideration the limitations of the cross-sectional design. In this study, data from the Turkish adult sample ($N=277$) was collected in two waves at four-month intervals. The ages of the sample group [195 (70.4%) female and 82 (29.6%) male] are between 20 and 55. The average age was calculated as 29.66 ($SD=8.27$). We used the cross-lagged panel model for the half-longitudinal mediation model for testing mediation with two time points at four-month intervals. The findings revealed that the variables of the study had significant longitudinal associations, and cognitive flexibility played a longitudinal mediating role in the relationship between family communication and happiness. The current results prove the importance of healthy relationships among family members and highlight the significant influence of family communication and cognitive flexibility on happiness.

Keywords Family communication · Cognitive flexibility · Happiness · Longitudinal mediation analysis

Introduction

The family, which is regarded as the basis of society, is essential to human life. In the literature, there are many different definitions of the family, which is expressed as the place where individuals are satisfied and meet their needs. For instance, Galvin et al. (2006) suggest that the family is a complex social system. According to another study, the family is a complex structure in which individuals share a common past, establish emotional bonds with other members, and meet their needs (Sabatelli & Bartle, 1995). Based on these definitions, the family can be explained as a social unit that requires the interaction of every member of it. This social unit is the basis for individuals' sources of social support. Family communication, as a key element of these interactions, serves as an independent variable that influences various outcomes such as happiness, emotional resilience, and overall wellbeing. Strong family relationships have been reported to protect individuals' psychological health, especially amid stressful and difficult life events (e.g., Alshehri et al., 2020; Cluver et al., 2020). Similarly, in the research of Rubino et al. (2020), it was also stated

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that family members' collaboration is essential for people's mental health. Family communication, acting as an exogenous variable, has been observed to directly influence outcomes such as happiness, which functions as an endogenous variable in this study. The causality implied here suggests that the nature and quality of family interactions can either strengthen or undermine an individual's happiness, depending on the level of support and connection provided. Family communication plays a fundamental role in concepts such as family wellbeing and family system development. Previous research emphasizes that maintaining family relationships underpins the development of wellbeing (e.g., Galvin et al., 2015; Lam et al., 2012; Suter & Norwood, 2017). The content of family communication and shared structures shapes emotions and a sense of self (Kapetanovic & Skoog, 2021). However, it is critical to acknowledge that family communication itself may be influenced by unmeasured variables, such as socioeconomic status, cultural norms, or individual personality traits, which could potentially confound the observed relationship between communication and happiness. These omitted variables may either amplify or attenuate the effects, necessitating a careful interpretation of causality. All of these studies reveal the importance of strong family relationships and family communication for individuals' happiness. The current study posits that family communication serves as a foundational mechanism influencing happiness. By explicitly modeling family communication as an exogenous variable and happiness as an endogenous outcome, this research attempts to highlight the directional relationship between these constructs. Nevertheless, the possibility of endogeneity must be considered, as unobserved confounding factors may simultaneously affect both variables, leading to potential biases in the estimation of the relationship.

Family communication is explained differently from communication established by individuals with the people around them (Geçer & Yıldırım, 2023). According to Le Poire (2006), family communication is defined as the relationship established in order to fix individuals' family problems. Marra et al. (2020), on the other hand, emphasized the importance of family communication in coping with difficult life events. In another study, it was stated that family communication improves family harmony (Taipale, 2019). In their twelve-week experimental study, Ho et al. (2016) emphasized that community-based family interventions increased subjective happiness by strengthening intra-family communication. These studies demonstrate that family communication is essential for both family life and individual psychological health.

When the literature is examined, many theories about communication can be found (e.g., Bandura, 2009; Doyle, 1982; Liu et al., 2017). Communication theory is defined

as a field that tries to understand and explain how the communication process occurs (Mortensen, 2017). Among these communication theories, it can be thought that some of them may be associated with the psychological health of individuals. For instance, the effect of communication on individuals' mental health is mentioned in Social Cognitive Theory (Bandura, 2009), Communication Skill Model (Doyle, 1982), and Social Network Theory (Liu et al., 2017). Social Cognitive Theory, an important theoretical approach in the field of communication, has an important role in explaining the interactions of individuals in their environment, especially their families. It also has a determining role in the mental health of individuals (Fabian, 2000). Another communication theory that is thought to have a determining role in mental health is the Communication Skills Model (Gordon, 2001). This model focuses on individuals' active listening in interpersonal relationships, empathy, and improving their verbal communication skills, and the importance of developing all these skills is emphasized. Lastly, Social Network Theory emphasizes the examination of individuals' social connections in the context of their personal characteristics. For example, in Kim et al.'s (2021) study, subjective happiness was examined in the context of Social Network Theory. When all these theories are examined, it can be said that the common main purpose is to enable gaining insight into how communication affects individuals and their environment. In other words, it can be stated that healthy social communication can positively change many areas of individuals' lives. Strong family communication is the basis of healthy social communication.

Strong family communication can raise people's levels of happiness. This possibility is also supported by the literature. Studies revealed that family communication is a variable that increases happiness (e.g., Jowkar & Rahimi, 2008; Marra et al., 2020) and strengthens individuals' wellbeing (e.g., Hado & Feinberg, 2020; Ho et al., 2018; Prime et al., 2020). These studies are also supported by a recent study by Gong et al. (2022). According to the afore-mentioned study, family communication is one of the indicators of an individual's happiness. In addition, it has been noted in other research in the literature that family communication has a positive effect on individuals' mental health (e.g., Geçer & Yıldırım, 2023; Zarnaghash et al., 2013). All of these studies demonstrate that by establishing healthy communication within the family, individuals can easily overcome various economic, social, and psychological difficulties while also maintaining their psychological health. In other words, even though people confront challenges in life, if they have healthy family communication, they can overcome this problem and be happy by enjoying life. There may be other factors that play a role in this relationship between family communication and happiness. One of these factors

is cognitive flexibility, which is associated with both family communication and happiness concepts in the literature. Studies in the literature emphasize that individuals with high family communication also have high cognitive flexibility (e.g., Eshagh Neymvari et al., 2023; Koesten et al., 2009). There are also recent studies showing that individuals with high cognitive flexibility are happier (e.g., Cırcır & Tagay, 2024; Fu & Chow, 2017; Satici et al., 2024). All these studies contribute to the prediction that cognitive flexibility may mediate the relationship between family communication and happiness. Therefore, this study examined the longitudinal mediating role of cognitive flexibility in the relationship between family communication and happiness. In this context, below, the rationality of the longitudinal mediating role of cognitive flexibility in this relationship is detailed.

Cognitive flexibility as a mediator

According to Martin and Rubin (1995), cognitive flexibility, which is the topic of many studies in the literature, is defined as the individual's awareness of his options and alternatives in life, his willingness to adapt to life events, and his self-efficacy in being flexible. In another study, cognitive flexibility was described as the individual's ability to think differently by considering changing life conditions and trying to adapt to changing environmental stimuli (De Dreu et al., 2008). Individuals with cognitive flexibility can come up with new alternatives in the face of unexpected events (Cañas et al., 2003; Martin et al., 1998), use coping strategies with more self-confidence (Johnson, 2016), and adapt quickly to their environment (Martin & Anderson, 1998).

Cognitive flexibility is an important concept for individuals' psychological health and wellbeing in both their family and individual lives. Individuals' cognitive flexibility can be enhanced by establishing strong family relationships and having healthy family communication. This view is supported by the findings of Koesten et al. (2009). In the afore-mentioned study, it was reported that healthy family communication has a positive effect on cognitive flexibility. Similarly, other studies in the literature have shown that there is a significant relationship between family communication and cognitive flexibility (e.g., Curran et al., 2019; Rahimi et al., 2018). This positive reflection of family communication on cognitive flexibility may also have a positive effect on an individual's happiness. Based on this inference, it has been reported in the literature review that individuals are happier as their cognitive flexibility level increases (e.g., Asıcı & İkiz, 2015; Demirtaş, 2020a; Fu & Chow, 2017). Polat et al.'s (2022) recent study from revealed that cognitive flexibility predicts people's happiness levels. Considering all these research results, it can be said that family

communication can influence the happiness of individuals through cognitive flexibility.

As previously stated, while there are several studies in the literature addressing the relationship between family communication, cognitive flexibility, and happiness, no research has been found that takes these three variables into consideration together. The negative impact of unhealthy family relationships on individuals' mental health (Geçer & Yıldırım, 2023; Prime et al., 2020) necessitated this research that deals with family communication and happiness. This study focuses on the direct effects of family communication, which is considered as an external variable, on happiness, which is an internal variable, and on the mediating role of cognitive flexibility in this relationship. This may reveal the importance of indirect effects in understanding the connection between these structures. In addition, another important aspect of this study is that it tests the variables with a longitudinal research design. Longitudinal research allows for observing how changes in family communication influence happiness over time, reducing the ambiguity of causality and providing stronger evidence for the direction of the relationship. Because it has been determined that the concept of happiness, which is especially examined in association with family communication, has been studied longitudinally in a limited number of studies in the literature (e.g., Fulkerson et al., 2010). In the literature review, it is seen that generally, longitudinal studies are done less than cross-sectional studies. However, longitudinal studies are stronger than cross-sectional studies in terms of reliability and validity. This approach also accounts for the potential influence of unmeasured confounding variables, such as socioeconomic factors or cultural differences, which may affect both family communication and happiness simultaneously. The increasing frequency of longitudinal studies may lead researchers to prefer this method. Family communication is a concept that has long-term effects on people's lives. Longitudinal examination of this concept, which has a long-term effect on the daily life of the individual, is also very important. In this context, the purpose of this research is to examine the mediating role of cognitive flexibility in the relationship between family communication (exogenous variable) and happiness (endogenous variable) through a longitudinal mediation analysis. For this purpose, answers to the following research questions (RQ) were sought:

RQ1. Does family communication significantly predict happiness?

RQ2. Does family communication significantly predict cognitive flexibility?

RQ3. Does cognitive flexibility significantly predict happiness?

RQ4. Does cognitive flexibility mediate the relationship between family communication and happiness?

Methods

Participants and procedure

The convenience sampling method was used in this longitudinal research. The convenience sampling method is a time and economically advantageous method where researchers may easily reach volunteers who are suitable for the purpose of the study (Gravetter & Forzano, 2012). Muthen & Muthen (2002) emphasize that the sample size should be at least 250 people in model building studies based on structural equation modeling. Based on this rationale, data were collected from 294 participants for the first wave of the study in August 2022. Data from 279 participants was collected for the second wave of the research in December 2022, four months later. Data collected in two waves, four months apart, were matched, and the final sample consisted of 277 [195 (70.4%) female and 82 (29.6%) male] Turkish adults. While the ages of this sample group ranged from 20 to 55, the mean age was calculated as 29.66 (SD = 8.27).

The longitudinal design was specifically chosen to strengthen causal inferences by establishing the temporal precedence of the independent variable (family communication) over the dependent variable (happiness). This design reduces concerns about reverse causality and enhances the validity of the observed relationships by observing changes over time. Additionally, by collecting data at multiple time points, the study controls for stable individual differences that might confound cross-sectional analyses.

In both waves, research collected data through a web-based form. This online form link has been shared in public social media groups from the researchers' social media accounts. All participants were informed about the research before the measures were used, and their consent to participate in the research was obtained. It was explained to the participants that the study was a longitudinal study, therefore, their opinions would be sought again for the second wave study four months later. The fact that participation in the study was completely voluntary was emphasized. In the second wave study conducted four months later, 17 participants wanted to withdraw from the study and were not included in the data collection process. In addition, none of the participants received any payment. To ensure the exogeneity of the independent variable, careful consideration was given to the temporal separation of measurements and the inclusion of autoregressive effects in the analysis. This strategy helps to mitigate potential confounding factors, such as personality traits or unmeasured baseline characteristics, which remain

stable across time points. In order to ensure the reliability and validity of the data, the participants were asked to fill in certain codes. These codes included: (1) a nickname; (2) the first three letters of their mother's first name; and (3) the last three letters of their father's first name. By means of these codes, it was possible to distinguish whether the respondents were automatic bots or people who filled in more than once. Finally, the online form utilized in the study was designed such that participants could leave at any time and submit only after completing all questions.

Ethical considerations

Ethics committee approval of the study was given by the Scientific Research and Ethics Review Committee of Artvin Coruh University (Reference Number: E-18457941-050.99- 54375). The study was performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki and its following updates.

Measures

Family Communication Scale (FCS)

The FCS was developed by Geçer and Yıldırım (2023). The six items (e.g., “*I am happy with the way we communicate in our family*”) are rated on a four-point scale from 1 (*strongly disagree*) to 4 (*strongly agree*), with scores ranging from 6 to 24. In addition, there is no reverse item on the scale. The higher the score, the greater the degree of family communication. The Cronbach alpha internal consistency coefficient of the measurement tool was calculated as 0.82 (Geçer & Yıldırım, 2023). In this study, the Cronbach's alpha value was calculated as 0.87 for family communication T1 and 0.88 for family communication T2 (see Table 1).

Cognitive Flexibility Inventory (CFI)

The CFI was developed by Dennis and Wal (2010; Turkish version: Sapmaz & Doğan, 2013). The 20 items (e.g., “*I find it difficult to make decisions when faced with difficult situations*”) are rated on a seven-point scale from 1 (*strongly disagree*) to 7 (*strongly agree*), with scores ranging from 20 to 140. In addition, there are reverse items on the scale. The higher the score, the greater the cognitive flexibility. The adaptation study's Cronbach alpha internal consistency coefficient was determined to be .90 (Sapmaz & Doğan, 2013). In this study, the Cronbach's alpha value was found to be 0.88 for cognitive flexibility T1 and 0.92 for cognitive flexibility T2 (see Table 1).

Table 1 Descriptive statistics and reliabilities for the study variables

Variable	Correlations					Descriptive Statistics and Reliabilities					t test outcomes			Hedge's g
	1	2	3	4	5	Mean	SD	Skewness	Kurtosis	α	t	p		
1. Family communication T1	–					19.17	3.36	–0.766	0.901	0.870	1.55	>0.05		0.073
2. Family communication T2	0.686**	–				18.92	3.46	–0.668	0.558	0.884				
3. Cognitive flexibility T1	0.317**	0.240**	–			109.75	14.57	–0.369	–0.338	0.886	1.74	>0.05		0.082
4. Cognitive flexibility T2	0.489**	0.404**	0.701**	–		108.46	16.70	–0.258	–0.643	0.926				
5. Happiness T1	0.399**	0.354**	0.375**	0.347**	–	19.30	4.79	–0.414	–0.306	0.807	2.38	<0.05		0.126
6. Happiness T2	0.318**	0.352**	0.393**	0.412**	0.620**	18.70	4.71	–0.540	0.059	0.793				

** $p < 0.01$, $df = 276$

Subjective Happiness Scale (SHS)

The SHS was developed by Lyubomirsky and Lepper (1999; Turkish version: Akin & Satici, 2011). The four items (e.g., “Some people are generally very happy. They enjoy life regardless of what is going on. How does this apply to you?”) are rated on a seven-point scale from 1 (not at all) to 7 (a great deal), with scores ranging from 4 to 28. In addition, there are reverse item on the scale. The high scores indicate high levels of subjective happiness. In Akin and Satici’s (2011) study, the Cronbach’s alpha value was reported as 0.86. In this study, Cronbach alpha coefficient was determined as 0.80 for happiness T1 and 0.79 for happiness T2 (see Table 1).

Data analysis

This study examines the mediating role of cognitive flexibility in the longitudinal relationship between family communication and happiness. Considering that cross-sectional data are limited in revealing the relationship between variables, autoregressive analysis of the cross-lagged panel model was used in this study for a half-longitudinal design (Preacher, 2015). The cross-lagged panel model is a method used to test the research hypothesis and detect the changes of variables at different times (Selig et al., 2012). The half-longitudinal mediation model is expressed as an autoregressive cross-lagged panel model (Cole & Maxwell, 2003).

In this study, descriptive statistics were first calculated, including the mean, standard deviation, skewness, kurtosis, and correlation coefficients between the variables. Then, a cross-lagged panel model was applied for a half-longitudinal design using structural equation modeling to investigate whether cognitive flexibility mediates the relationship between family communication and happiness. Additionally, gender was added to the half-longitudinal mediation model as a control variable. As a result of the analyses, some fit index values were examined for model fit. According to Hooper et al. (2008), Comparative Fit Index (CFI), Goodness of Fit Index (GFI) and Incremental Fit Index (IFI) should be greater than 0.90 and standardized root mean squared value (SRMR) and root mean square error of approximation (RMSEA) being less than 0.08 indicates a good fit. Additionally, bootstrap confidence intervals were reported. Testing significance in mediation models using the bootstrapping method increases reliability. All analyses were performed using the SPSS 26 statistical package program and AMOS Graphics.

Results

This section first presents the findings from the rudimentary analysis of the research, followed by the findings related to the main purpose of the study. Table 1 lists the means, standard deviations, skewness, and kurtosis of family communication, cognitive flexibility, and happiness level at baseline (T1) and four-month follow-up (T2) and the correlation coefficients between these variables. Bivariate correlations of family communication, cognitive flexibility, and happiness showed significant positive relationships ($p < 0.01$, see Table 1).

When Table 1 is examined, it is seen that there are positive relationships between family communication and cognitive flexibility ($r = 0.317, p < 0.01$), between family communication and happiness ($r = 0.399, p < 0.01$), and between cognitive flexibility and happiness ($r = 0.375, p < 0.01$) in the first measurements. Similarly, in the second measurement at a four-month follow-up, there are positive relationships between family communication and cognitive flexibility ($r = 0.404, p < 0.01$), between family communication and happiness ($r = 0.352, p < 0.01$), and between cognitive flexibility and happiness ($r = 0.412, p < 0.01$).

The final sample of the study ($n = 277$) matched at T1 and T2 and included in the analysis according to study variables was compared with the paired sample t-test. Family communication scores for the T2 ($M = 18.62, SD = 3.46$) and T1 ($M = 19.17, SD = 3.36$) situations did not differ significantly; $t(277) = 1.55, p > 0.05$. Cognitive flexibility scores for the T2 ($M = 108.46, SD = 16.70$) and T1 ($M = 109.75, SD = 14.57$) situations did not differ significantly; $t(277) = 1.74, p > 0.05$. Lastly, happiness scores for the T2 ($M = 18.70, SD = 4.71$) and T1 ($M = 19.30, SD = 4.79$) situations differ significantly; $t(277) = 2.38, p < 0.05$.

Longitudinal mediational model

We investigated whether family communication (X) would be associated with happiness (Y) and whether this association would be explained through cognitive flexibility (M). In the mediation models, (a) the path of T1 family communication (X) on T2 cognitive flexibility (M_2) while controlling for T1 cognitive flexibility (M_1), (b) the path of T2 cognitive flexibility (M_2) on T2 happiness (Y_2) while controlling for T1 happiness (Y_1) and T1 cognitive flexibility (M_1), and (c) the path of T1 family communication (X) on T2 happiness (Y_2) while controlling for T1 happiness (Y_1) were examined to investigate the indirect and direct effects. Firstly, the partial mediating role of flexibility between communication and happiness has been examined. In the partial mediation model, there is a direct path from T1 family communication to T2 happiness. Although the

goodness-of-fit indices for this model were deemed acceptable ($\chi^2_{(5, N=277)} = 9.40, p < 0.001; \chi^2/df = 1.88, CFI = 0.991, IFI = 0.991, GFI = 0.989, RMSEA = 0.056, SRMR = 0.039, AIC = 41.40, ECVI = 0.150$), it was observed that the path from the independent variable (X) to the dependent variable (Y) is not significant ($\beta = 0.014, p > 0.05$). Therefore, this path was removed, and the full mediating model was tested. The goodness-of-fit indices for the full mediating model are acceptable ($\chi^2_{(6, N=277)} = 9.46, p < 0.001; \chi^2/df = 1.57, CFI = 0.993, IFI = 0.993, GFI = 0.989, RMSEA = 0.046, SRMR = 0.039, AIC = 39.46, ECVI = 0.143$), and all paths are statistically significant. The full mediating model was preferred due to both the smaller values of AIC and ECVI and the insignificance of the direct path from family communication to happiness. In the full mediating model, Path *a* indicated a direct positive effect, suggesting that high levels of family communication were related to the highest levels of cognitive flexibility ($\beta = 0.302, p < 0.01$). In addition, path *b* revealed a direct positive effect, suggesting that high levels of cognitive flexibility were related to the highest levels of happiness ($\beta = 0.226, p < 0.01$). In addition, the indirect effects of family communication on happiness via cognitive flexibility were statistically significant (standardized indirect effect = 0.068; 95% CI: 0.037, 0.113). Therefore, cognitive flexibility fully mediated the associations between family communication and happiness (see Fig. 1).

Discussion

Family life is an important protective factor for an individual's psychological health. Healthy relationships between family members can help individuals meet their needs and enjoy life more. Communication is the basis of this healthy relationship. Strong and high-quality family communication has a positive effect on both family and individual wellbeing (Wang et al., 2015). Therefore, the aim of the research was to longitudinally examine the relationship between family communication and happiness as well as the role of cognitive flexibility in mediating this relationship. The analysis carried out in line with the research aim revealed that there were significant longitudinal relationships between the variables of the study. In addition, it has been determined that cognitive flexibility plays a longitudinal mediating in the relationship between family communication and happiness. All of the research findings are discussed in detail below in light of the literature.

The study's first finding is that family communication directly predicts happiness. This finding provided answers to the first research question. The results of the research in the literature are in line with the findings of this study (e.g., Gong et al., 2022; Marra et al., 2020; Prime et al.,

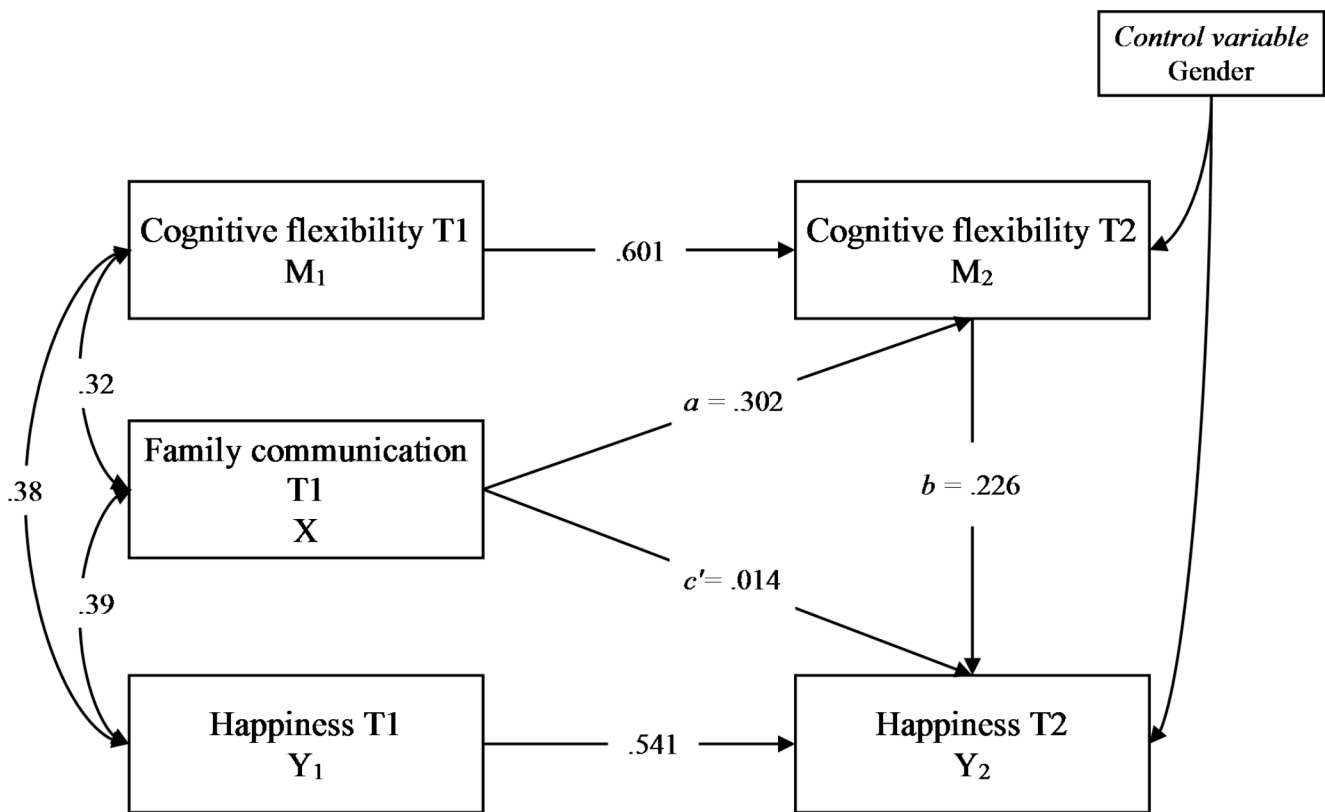


Fig. 1 The half-longitudinal mediation model

2020). In the afore-mentioned studies, it has been reported that healthy family communication is effective in increasing individuals’ happiness and wellbeing. Similarly, in the study of Hado and Feinberg (2020), it was stated that there is a significant relationship between family communication and happiness. Besides these studies, it has been explained in the literature that family communication is an important variable for the mental health of individuals (e.g., Geçer & Yıldırım, 2023). The results of experimental studies conducted by Ho et al. (2016, 2018) also support the relationship between family communication and happiness. Based on all the research results mentioned above, it can be said that the healthy relationships established in family life have a significant effect on individual happiness. It can be interpreted that individuals’ being happier in their lives depends on the level of family communication. As people build positive relationships within the family environment, where they share a common life and receive emotional support through healthy communication channels, their happiness levels can rise. Individuals with high family communication can easily share their positive or negative emotions and get the attention they need from people they feel close to. This may contribute to them having a more positive outlook on life and increasing their happiness levels. In addition, people can

increase their happiness levels with activities that support their communication levels within the family.

The study’s second finding is that family communication has a significant predictive effect on cognitive flexibility. This finding is in parallel with the results of previous studies. For instance, in the study of Curran et al. (2019), it was reported that individuals have more cognitive flexibility as family communication increases in their lives. Rahimi et al. (2018) also found a significant relationship between family communication and cognitive flexibility. Finally, the Koes-ten et al. (2009) study revealed that healthy family communication has an effect on individuals’ cognitive flexibility. All of these findings indicate that family communication has an important role on cognitive flexibility. This finding is the answer to the second research question of the study. It can be said that individuals with high family communication levels are more cognitively flexible. This may be due to the fact that he does not occupy his mind with family problems. When faced with an issue, a person could need guidance from more seasoned people. Individuals may produce more original ideas, look at the problems they encounter from different perspectives, or produce more creative solutions with the advice they receive through family communication. Because communication within the family may contribute to people reaching the necessary guidance and

different perspectives whenever they need it. Individuals with a low level of family communication may encounter more family problems. Since this will increase the mental load of the individual, it may negatively influence their flexible thinking skills.

Cognitive flexibility, which rises with healthy family communication, has a favorable reflect on happiness. This finding is an answer to the third research question of the study. Many research results supporting this finding have been reached in the literature (e.g., Polat et al., 2022; Topkaya et al., 2022; Yıldız & Eldeleklioğlu, 2021). All these afore-mentioned studies have reported that there are significant relationships between the cognitive flexibility level of individuals and their happiness. As in previous studies, Kato's (2012) research explained that those with low cognitive flexibility were more likely to be in a negative mood. In addition, previous research has revealed that individual wellbeing, like happiness, is also associated with cognitive flexibility (e.g., Cardom, 2016; Demirtaş, 2020b; Özhan & Boyacı, 2021). Based on all the studies afore-mentioned, it can be said that cognitive flexibility can influence all aspects of the psychological health of individuals, such as happiness, wellbeing, and spiritual mood. Individuals who are more cognitively flexible can produce more functional solutions to the problems they may encounter, as they are more capable of producing alternative thoughts. In this way, a problem encountered in daily life can be eliminated, and life can be continued in a happier way. All of this demonstrates the repercussions of not being cognitively rigid on wellbeing.

The last and main finding of the study is that cognitive flexibility has a mediating role in the relationship between family communication and happiness. This finding answered the fourth research question. As mentioned earlier, although there are study findings demonstrating the bilateral relationship between these variables, no research results were found when these three variables were considered together. The results of this study clearly reveal that healthy family communication increases cognitive flexibility in individuals and that this situation has a positive effect on individuals' happiness. It can be said that individuals can develop original coping skills thanks to cognitive flexibility. Because being cognitively flexible means being able to switch between alternative thoughts. People with increased intra-family communication become more comfortable mentally with the support they receive from their families. Support and guidance from the family helps the individual produce alternative thoughts. In this way, the cognitive flexibility level of the individual can be increased. It is possible that the happiness levels of individuals whose cognitive flexibility increases and who solve the problems they encounter in life faster will also increase. Therefore,

increased family communication can increase cognitive flexibility and contribute to a happier life for individuals. Previous studies explain the relationship between the three concepts discussed in the research, mostly based on experimental and cross-sectional methods. This research makes a distinct contribution to the literature as it reveals the long-term effects of the relationship between concepts. Therefore, the results of this research are valuable for the literature.

Implications

Family relationships and family life are important protective factors for psychological health. Positive family relationships have a significant predictive effect on individuals' psychological health (Ramos et al., 2022). Furthermore, cognitive flexibility is an important determinant of individuals' wellbeing (Satici et al., 2020). Considering all of these findings, maintaining well-structured family communication and high cognitive flexibility makes it easier for family members to be happy. The findings of this research support the idea that improving healthy family communication between individuals increases cognitive flexibility. At the same time, this situation has a positive reflection on an individual's happiness. Individuals who are successful in family communication may be more successful in thinking flexible, producing alternative solutions, and thinking creatively. Because cognitive flexibility is also considered a sub-dimension of creative thinking (Kemple & Nissenberg, 2000; Onur & Zorlu, 2017), being skilled in flexible thinking and producing alternative solutions or creative ideas brings success in educational, professional, or social relationship management. All these skills may indirectly contribute to an individual's living a happier life.

Mental health professionals may develop and execute interventions and preventive programs that enhance people's mental health and happiness in light of the study's findings. Psycho-educational programs that may be developed should be prepared to include family life. Implementing psycho-educational programs for family life, especially for individuals from all walks of life, can increase community wellbeing and individual happiness. Apart from that, the results of this research can help practitioners with the family counseling process. Supporting family communication may help people think more flexibly and live happier lives with alternative problem-solving techniques. Finally, it is crucial that this study be conducted using a longitudinal research design. In this way, the long-term effects of family communication on individuals have been revealed, and more scientifically valid results have been brought to the literature. It has been determined that in the literature, family communication is generally examined through cross-sectional studies, while a limited number of studies use a longitudinal

research design (e.g., Fulkerson et al., 2010). Therefore, it may be concluded that the findings of this research provide more valid results than the cross-sectional design. In future studies, these variables may be studied longitudinally with different samples. Or, in further research, the concepts in this research can be examined in a longitudinal design with different variables.

Limitations and future research

Although this study has important implications, it also has some limitations. The first limitation is that the data is collected using self-report scales. Although adhere to the principle of voluntariness, the use of self-report scales may cause social desirability errors. Self-report measures can undermine claims of causal relationships between variables, so the focus can be on why the discovered correlations are novel, the significance of the correlations, how the problems can be addressed, and potential policy implications. Additionally, in longitudinal studies, data is collected online, and matching problems may occur when collecting pseudonym information, which may be seen as another limitation. Therefore, different methods of data collection may be preferred in future studies. The second limitation is that study data is collected and analyzed at four-month intervals. This is a limitation that may be encountered due to the nature of the cross-lagged panel model for a half-longitudinal design. Still, in future studies, longer follow-up studies can be conducted to examine the links between these variables. The third and last limitation is that the data were only collected from Turkish samples using a convenience sampling method. Family has great importance in Turkish culture. Due to cultural norms, family communication may affect the decisions of the individual. Therefore, compared to other countries, the effect of family communication on the individual may be greater in Turkish culture. From this point of view, in the future, an intercultural study may be conducted by collecting highly representative data from different cultures.

Conclusion

As a result, it was found in this research that family communication has a direct effect on individual happiness and that cognitive flexibility plays a mediating role between family communication and happiness. The fact that the research was conducted in a longitudinal research design revealed the relationship between the variables more clearly. This would allow for a clearer interpretation of the long-term relationship between concepts. Our results highlighted the importance of strong family relationships and

well-structured family relationships in determining individual happiness. Based on this result, studies that will support family communication can be added to the content of programs developed to increase cognitive flexibility. As a result of the analyses, it was seen that the happiness levels of individuals who increased their cognitive flexibility indirectly increased. Based on this, it can be suggested that future research aimed at improving individuals' happiness levels should include practices that will increase cognitive flexibility. Lastly, cross-cultural research on the topic may make a unique contribution to the literature.

Pre-registration statement This study was not pre-registered.

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Data availability Data will be available on request.

Declarations

Ethical approval The study protocol has been approved by the Human Research Ethics Committee of Artvin Coruh University. The study was performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki and its following updates.

Consent to participate Informed consent was obtained from all the individual participants that were included in the study.

Conflict of interest No conflict of interest exists for this manuscript for any of the authors.

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