



# Cognitive, Affective and Behavioral Investigation of Turkish People's Attitudes Towards the COVID-19 Pandemic Quarantine Process

Türk Halkının COVID-19 Pandemisi Karantina Sürecine Yönelik Tutumlarının Bilişsel, Duyuşsal ve Davranışsal Boyutta İncelenmesi

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## ABSTRACT

**Aim:** The aim of study is to determine the attitude of the Turkish people (in cognitive, affective and behavioral dimensions) and the factors affecting this attitude during the coronavirus epidemic that has affected the whole world since December 2019.

**Materials and Methods:** The data collected by a scale were modeled with explanatory factor analysis (EFA), confirmatory factor analysis (CFA) and structural equation modeling (SEM), and the effects of the dimensions and the importance of the effective items in each dimension were determined.

**Results:** 61.4% of the participants were male and 65.4% were under the age of 40 years. Individuals' "questioning their purpose of coming to life again" and "desire of being more sensitive to the events around them than in the past" were found to be significant, respectively. Other results obtained from the study are given in the relevant tables and figures.

**Conclusion:** It was determined that the affective dimension had the highest effect on the results of EFA, CFA and SEM analyses, which were effective in examining the attitudes of individuals towards an event with these sub-dimensions.

**Keywords:** COVID-19, epidemic processes, attitude and behavior, statistical modeling

## ÖZ

**Amaç:** Bu çalışmanın amacı, Aralık 2019'dan beri tüm dünyayı etkisi altına alan koronavirüs salgını süresince Türk halkının sergilediği tutumu (bilişsel, duyuşsal ve davranışsal boyutlarda) ve bu tutum üzerinde etkili olan etmenleri belirlemektir.

**Gereç ve Yöntem:** Bir ölçek aracılığı ile derlenen veriler açıklayıcı faktör analizi (AFA), doğrulayıcı faktör analizi (DFA), yapısal eşitlik modellemesi (YEM) ile modellenerek, boyutlar arası ilişkiler ile her bir boyutta etkili olan maddelerin önemleri belirlenmiştir.

**Bulgular:** Katılımcıların %61,4'ü erkek ve %65,4'ü 40 yaş altıdır. Bireylerin tutumlarını açıklayan alt boyutlardan davranışsal boyut üzerinde bireylerin ekonomik tedbirlere vereceği önemin en etkili değişken olduğu, bilişsel ve duyuşsal boyutlarda ise sırası ile bireylerin hayata geliş amaçlarını tekrar

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sorgulamaları ve çevrelerindeki olaylara karşı geçmiştekinden daha duyarlı olacaklarının önemi anlamlı bulunmuştur. Çalışmadan elde edilen diğer sonuçlar ilgili tablo ve şekillerde verilmiştir.

**Sonuç:** Bireylerin bir olaya karşı olan tutumlarının bu alt boyutlar ile incelenmesi noktasında etkili olan istatistiksel yöntemlerden AFA, DFA ve YEM analizi sonuçlarında duyuşsal boyutun etkisinin en yüksek olduğu belirlenmiştir.

**Anahtar Kelimeler:** COVID-19, salgın süreçleri, tutum ve davranış, istatistiksel modelleme

## INTRODUCTION

In our country, the time spent at home has increased within the scope of the measures taken after the first coronavirus disease-2019 (COVID-19) case observed on March 11<sup>th</sup>. It has been observed that our citizens' awareness and sensitivities on some issues have increased. In addition, it is observed that the shares they make through social media have increased and they question their purpose of life and the values they give to their loved ones. While many individuals state that they have accomplished the things they wanted to do but did not have the opportunity to do before due to the hustle and bustle of life, it should not be overlooked that each of them has shared how important it is to be able to walk freely on the street, to eat at a restaurant and to drink tea in a cafe with their friends, without realizing it. Depending on these, it is seen that they express how important social solidarity is and that material things such as the house, the car, etc do not mean anything without humanity and it is remarkable that there has been an increase in shares about that they support aid campaigns for people in economic difficulties and that they are more sensitive towards street animals during this period. While some people are bored with staying at home, some people have to work without the luxury of staying at home because they provide for their families and the contribution of their work to this process is indispensable, the importance of which has been well-understood. In addition to these, it is another remarkable point that although people understand the importance of their health once again, they are psychologically tense with the fear of facing the deadly virus as a result of the slightest carelessness, and that intra-familial conflicts have increased both around the world and in our country.

All these indicators can be evaluated as a result of individuals' attitudes towards daily events, which differ in cognitive, affective and behavioral dimensions in this process. In this context, the aim of this study is to reveal the differences related to these dimensions both at the national and international levels and to contribute to humanity by emphasizing the importance of the positive and negative variables that cause it.

The research hypotheses of the study are given as items below.

1. What are the cognitive attitudes of individuals towards the COVID-19 pandemic quarantine process?

2. What are the affective attitudes of individuals towards the COVID-19 pandemic quarantine process?

3. What are the behavioral attitudes of individuals towards the COVID-19 pandemic quarantine process?

4. Is there a significant difference among individuals' cognitive, affective and behavioral attitudes towards the COVID-19 pandemic quarantine process?

5. Do individuals' attitudes towards the COVID-19 pandemic quarantine process differ significantly according to their demographic characteristics?

6. Do individuals' cognitive and affective attitudes towards the COVID-19 pandemic quarantine process have a significant effect on their behaviors?

## Literature Review

Although the origin of the word pandemic is a combination of the Greek words "pan" (all) and "demos" (people), this word is often used for epidemic infectious diseases that are widespread in the whole country or in one or more continents at the same time<sup>1</sup>.

However, the use of this word with its definition in many medical texts has been neglected in the last 20 years. This word did not find a place in the indexes of many authoritative studies and texts about the pandemic, even in comprehensive sources on the history of medicine, in classical epidemiological sources, and in the effective infections report of the institute of medicine in 1992<sup>2</sup>. Internationally accepted known and common definition of pandemic in the epidemiology dictionary is "an epidemic that occurs worldwide, or that originates in large areas and transcends international borders, affecting large masses of people"<sup>3,4</sup>.

Among all known pandemic pathogens, influenza (flu infection) has been the main cause since the 16<sup>th</sup> century due to its potential seriousness and irregular occurrence<sup>5,6</sup>.

In all other pandemics and the COVID-19 pandemic process, the most effective individual measures, apart from the measures taken by the administration, can be listed as giving maximum importance to hygiene, eating natural and healthy, increasing mobility and exercise, and paying attention to social isolation<sup>7</sup>. At this point, the importance of education

shows itself once again. The higher the number of conscious individuals in a society as a result of education, the higher the probability of success in the fight against epidemics. In this context, it should be emphasized that by creating a permanent awareness, people should act in line with ethical values and care about other people's lives.

It is known that it is easier to fight the pandemic in societies where healthy individuals are in the majority, and it has also been observed during the COVID-19 process and in the past that individuals with a healthy immune system are more likely to win the struggle for their lives, even if the virus is transmitted.

In the COVID-19 process, it is seen that the ethics in the behavior of individuals who make up all societies with their physicians, scientists, politicians affect the period we live in. The COVID-19 pandemic offers us an opportunity to reconsider our values, from individual ethics to social ethics, from professional ethics to political ethics. In this process, it has been realized that we need to balance the value of life and the profitability of the capitalist system in terms of bioethics and environmental ethics, and that the policies we create with human-centered thinking cannot be isolated from other life forms<sup>8</sup>.

### **The Effects of Pandemic on Human Attitudes and Behaviors**

When people are faced with a contagious disease epidemic, they can take some preventive actions against the negative effects of the epidemic in terms of health and economy to reduce the risk they face<sup>9</sup>.

Studies in the literature on behavioral responses to the flu epidemic can be found in related sources<sup>9-12</sup>. There are many theories about risk perception, such as protection motivation theory (PMT)<sup>13</sup>, health belief model<sup>14</sup>, extended parallel process model<sup>15</sup> and precaution adoption process model<sup>16</sup>. The basic idea on which these theories are based is that people react to any threat. PMT distinguishes two phases called assessment of threat and assessment of coping. Assessment of threat is perceived personal susceptibility (or perceived vulnerability) combining states of fear for the threat (belief in the possibility of contracting the disease) and for perceived severity of the threat (having a serious feeling of contracting the disease). Assessment of coping is defined as variables related to the proposed protection response.

These are the perceived response effect (What protective behaviors will help?), the individual effect on the perceived response (Am I a confident person to exhibit protective behaviors?), and the consequences of the reactions (What are the disadvantages of protective behaviors?). According to PMT, assessment of the threat triggers the intention to

act, while assessment of coping triggers the type of behavior exhibited<sup>17</sup>. Following the SARS epidemic that emerged in 2003, a population-based hypothetical study on people's protective measures in an influenza epidemic was conducted in 3 Asian and 5 European countries<sup>9</sup>. With some exceptions, the potential protective measures in each country were similar for individuals. Even in places where the risk was low, public transport was often cited as the most risky factor for disease transmission. Participants stated that in the event of a new epidemic, they would stay away from public transportation, entertainment places and shopping centers unless they are of vital importance. Participants also stated that although they cared about the high risk of contamination, they did not hesitate to go to health institutions. Moreover, participants working in one job stated that they took less protective measures than others. Interestingly, risk perception variables did not significantly affect their precautionary behaviors. They were only sensitive about public transportation<sup>17</sup>.

Available knowledge, attitudes, and belief systems about the risk associated with a disease may change over time. Mathematical models are a powerful tool for estimating the potential contagiousness of disease and for investigating effective control measures. For models with a complex structure, it has also been shown that contagion can be prevented by preventing direct interaction of other individuals with this network if individual precautions are taken sufficiently considering infected individuals in the social network<sup>18</sup>. There are increasing efforts to motivate people to maintain social distance and to limit their interaction with other people and accordingly the risk of social diseases. Social distancing is not a new concept and has been used for centuries to quarantine infected individuals and avoid illness, but new approaches must be introduced to deal with modern social interactions<sup>19</sup>. Although it is imperative to provide a balance between informing the public and not creating panic<sup>20</sup>, the community expects the latest up-to-date information and timely and satisfactory explanations of what and why to do from administrators<sup>21-23</sup>.

During the COVID-19 epidemic, which is still ongoing in our country, compulsory measures were taken by the state on issues such as maintaining a distance of at least 1 meter and using masks in public transportation, public and common social areas, and announcements and statements were made about raising a general awareness among citizens.

It is an inevitable fact that all these effects experienced during the COVID-19 process cause people to re-judge their values in their lives. From this point of view, it is thought that the attitudes exhibited in this process are also effective for the future periods and it is aimed to determine the factors that have effects on the attitudes of individuals in this study.

## Concept of Attitude

Attitude is not a directly observable feature, but a tendency attributed to that individual by inferring from the observable behaviors of the individual. In other words, an attitude is not a behavior that can be observed, but a tendency to prepare for behavior. The tendency of a person to show positive or negative behavior towards any event, object or person is called attitude. A mental assessment is the minimum requirement for a trend to be considered as an attitude, but most established attitudes that people develop over time include affective and behavioral elements. In other words, attitudes cannot be observed directly, but are revealed by the individual's other behaviors<sup>24-26</sup>. According to Fishbein and Ajzen<sup>27</sup>, behavioral, affective and cognitive elements must be in a consistent relationship with each other in the formation of attitude<sup>28</sup>. Smith<sup>29</sup> has explained the concept of attitude as "the tendency that is attributed to the individual and that regularly forms the thoughts, feelings and behaviors of the individual about a psychological object".

Attitude is expressed as learned self-tendency, which appears in the form of being for or against a concrete object or an abstract concept, and directs the thoughts and feelings of the individual<sup>30</sup>. According to Petty and Cacciopo<sup>31</sup>, attitudes are people's general evaluations of themselves, others, or other objects, events, or problems. These general assessments are based on many behaviors, affective and cognitive bases and affect their developments, changes and formations<sup>32</sup>. According to Thurstone<sup>33</sup>, an attitude is a positive or negative intensity ranking and rating directed towards a psychological object. It is accepted by scientists that some variables play a role in the formation of attitude, and scientists examine and express these variables in different ways. Middlebrook, on the other hand, admits that attitude has three components<sup>34</sup>. These components are expressed as follows<sup>35</sup>:

1. Cognitive Component: It is the individual's thoughts and beliefs about the attitude.
2. Affective Component: It is the individual's liking or disliking of the subject of attitude.
3. Behavioral Component: It is the behavior of the individual regarding the subject of attitude.

The cognitive element is the rational component of attitudes consisting of ideas, knowledge and beliefs. The affective component includes positive (happiness, joy, appreciation and satisfaction) and negative feelings and emotions (regret, anger, boredom, fear, etc.) rather than neutral information. The behavioral element, on the other hand, expresses the tendency of an attitude to turn into a behavior<sup>36,37</sup>. Bloom<sup>38</sup> has revealed that affective features increase the cognitive achievement in the relevant area by about a quarter, that is, about a quarter

of the variability in learning success is due to affective features<sup>35</sup>. The behavioral component expresses the tendency of an attitude to turn into a behavior<sup>36</sup>. The behavioral element reflects the tendency to act in accordance with the affective and cognitive elements and it is action-oriented<sup>37,39</sup>.

Although Qiu et al.<sup>4</sup> examined the effects of the pandemic in their studies by considering them in health, economy, social and security dimensions, these dimensions will be evaluated as cognitive, affective and behavioral dimensions of the attitudes of individuals during their stay at home due to the COVID-19 pandemic in this study.

## MATERIALS AND METHODS

In this study, it was primarily aimed to develop a new scale to determine the attitudes of Turkish people towards the COVID-19 pandemic quarantine process in cognitive, affective and behavioral dimensions. In this process, the evaluations of 10 scientists from different universities were taken to determine the expert opinions. These factors, namely cognitive, affective and behavioral dimensions, were examined with explanatory factor analysis (EFA), Confirmatory Factor Analysis (CFA) and structural equation model (SEM). The questionnaire used in the study was approved by the decision of Afyon Kocatepe University Scientific Research and Publication Ethics Committee dated 27.05.2020 and numbered 15.06.2020-E.17011.

### Statistical Analysis

Statistical methods were used to determine the statistical validity and reliability of the item pool created for the attitude scale, and the internal consistency of the scale for the reliability analysis was determined by the Cronbach alpha coefficient. In order to determine the sub-dimensions and the items collected in these dimensions in this scale, whose validity and reliability were ensured, EFA was applied to the relevant data set and the obtained dimensions were tested with CFA again. Finally, the dimensions affecting the behavior of individuals during the COVID-19 process were modeled with SEM, and the interdimensional relations and the importance of the items that were effective in each dimension were determined. Statistical Package for the Social Sciences and LISREL programs were used in the analysis of the data used in the study.

### Explanatory Factor Analysis

EFA can be defined as a multivariate statistics that aims to find and discover a small number of conceptually significant new variables (factors, dimensions) by bringing together a large number of interrelated variables. Factor analysis operates on the notion that measurable and observable variables can be reduced to fewer latent variables that share a common variance and are unobservable, which is known as reducing

dimensionality<sup>40</sup>. Rennie<sup>41</sup>, on the other hand, defines EFA as an analytical technique with a computational logic based on the relationships between observed variables, aiming to reach a small number of explanatory factors (concepts) that explain the maximum variance<sup>42</sup>.

### Confirmatory Factor Analysis

When we review the literature in general, it is seen that CFA is a method that is mostly applied after classical factor analysis studies<sup>43,44</sup>. In such studies, the researchers subject the factor structures that they have determined with the EFA study to CFA. Thus, although it is a highly accepted practice, such practices actually contradict the nature of the SEM somewhat. Because here, in a sense, it is about testing the factor structures that the data set has directed us. However, it should be noted right away that although the exploratory factor analysis results of studies that do not have a strong theoretical basis are very good, frustration can be experienced in the phase of CFA.

### Structural Equation Model

SEM is a statistical technique that is used to test the causal relationships between observed and unobserved (latent) variables, and analyzes especially latent variables with both dependent and independent variables in detail. It has also proven to be a useful technique in solving problems encountered in formulating theoretical structures. It is a systematic tool used especially in psychology, sociology, marketing and educational sciences to evaluate the relationships between variables and to test theoretical models. Technically, SEM is used to estimate the unknown parameters in the linear structure equation set. The variables in the equations are usually latent variables that are directly related to the observed variables.

SEM assumes that there is a causality structure between the set of latent variables and that latent variables can be measured through observed variables<sup>45</sup>.

It gives better results than other multivariate statistical techniques such as multiple regression, path analysis and factor analysis. Other statistical techniques fail to take into account the interactions between dependent and independent variables. SEM can also present statistical efficiency and explanatory ability<sup>46,47</sup> in a model test with a single comprehensive method. SEM is a method that predicts and tests by revealing the linear relationships of the theoretical connection between the variables<sup>48,49</sup>.

## RESULTS

As a result of the data compiled from the questionnaire included in the study, descriptive statistics are given in Table 1, 2 and 3.

According to Table 2, 61.4% of the participants were male and 65.4% were under the age of 39 years. While 29.2% did not have a fixed income, 70.8% had minimum wage or higher income. 76.1% had undergraduate and graduate degrees, 23.9% were primary, secondary, high school and associate degree graduates. In addition, while the rate of individuals who had COVID-19 positive people around themselves was 26.7%, the rate of those who did not have was 73.3%.

According to Table 3, when the averages of affective, cognitive and behavioral attitudes of the participants were examined in terms of gender, it was seen that the averages of women (4.21, 3.33, 3.75) were higher than the averages of men (3.97, 3.10, 3.69).

When the averages of affective attitudes were examined in terms of age groups, the averages of individuals between the ages of 20 and 39 years (4.16 for those aged 20-29 years and 4.14 for those aged 30-39 years) were found to be higher than those of other age groups (4.05 for those aged 19 years and below, 4.07 for those aged 40-49 years, 4.05 for those aged 50 years and over). However, when the averages of cognitive attitudes were examined, it was seen that the averages of the participants aged 19 years and younger (3.47) were higher than the averages of the other age groups (3.22 for those aged 20-29 years, 3.24 for those aged 30-39 years, 3.20 for those aged 40-49 years, 3.25 aged 50 years and above). On the other hand, in the behavioral dimension, the averages of individuals aged 30 years and over (3.80 for those aged 30-39 years, 3.89 for those aged 40-49 years, 3.85 for those aged 50 years and above) were higher than those of participants in other age groups (3.71 for those aged 19 years and below, 3.56 for those aged 20-29 years).

When the averages of affective attitudes were examined in terms of income level, the averages of the participants who did not have a fixed income (4.14) and those with an income of 4001-7000 TL (4.15) were observed to be higher compared to the averages of participants with other income levels (4.00 for minimum wage, 4.08 for 2000-4000 TL, 4.08 for 7001-10000 TL, 4.00 for 10001 TL and above).

When the cognitive attitude averages were examined, it was seen that the averages of the participants who did not have a fixed income (3.28) and who had an income between 2000 TL and 7000 TL (3.25 for 2000-4000 TL, 3.28 for 4001-7000 TL) were higher than those of participants with other income levels (3.11 for minimum wage, 3.14 for 7001-10000 TL).

In addition, it is seen that the average of the cognitive attitudes of the participants whose income level is 10001 TL and above has a negative attitude with 2.81. In the behavioral dimension, the averages of the participants with an income level of 4001 TL and above (3.76 for 4001-7000 TL, 3.84 for 7001-10000



**Table 1. Pandemics and their effects from the middle ages to the present.**

Year of its beginning	Event	Geographical region	Estimated case/death rate	Estimated economic, social or political impact
1347	Plague	Eurasia	Death in 30-50% of the European population <sup>50</sup>	It accelerated the collapse of the feudal order in Europe <sup>51</sup>
Beginning of 1500s	Onset of smallpox	America	Death more than 50% in some countries <sup>52</sup>	It eliminated indigenous communities that facilitated the hegemony of European countries <sup>53</sup>
1881	5. cholera epidemic	Worldwide	Deaths more than 1.5 million <sup>54</sup>	Attacks on the Russian Tsarist government and health workers <sup>55</sup>
1918	Spanish flu	Worldwide	Deaths between 20 and 100 million <sup>56</sup>	3% loss in Australia, 15% loss in Canada, 17% loss in England and 11% loss in USA based on GNP <sup>57</sup>
1957	Asian flu	Worldwide	Deaths between 700000 and 1.5 million <sup>58</sup>	3% loss in GNP in Canada, Japan, England and USA <sup>57</sup>
1968	Hong Kong flu	Worldwide	1 million deaths <sup>59</sup>	Direct or indirect cost of 23-26 billion \$ in USA <sup>60</sup>
1981 <sup>a</sup>	HIV/AIDS	Worldwide	Cases more than 70 million, 36,7 million deaths <sup>61</sup>	Annual 2% loss of GNP in Africa <sup>62</sup>
2003	SARS	4 continents, 3 countries	8098 possible cases, 744 deaths <sup>63</sup>	In GNP: 4 billion \$ loss in Hong Kong SAR and China, 3-6 billion \$ loss in Canada and 5 billion \$ loss in Singapore <sup>64</sup>
2009	Swine flu	Worldwide	Deaths between 151700 and 575500 <sup>65</sup>	1 billion \$ GNP loss in the Republic of Korea <sup>66</sup>
2012	MERS	22 countries	1879 symptoms, 659 deaths <sup>67</sup>	2 billion \$ loss triggering 14 billion \$ government promotion in the Republic of Korea <sup>68,69</sup>
2013 <sup>b</sup>	West Africa Ebola epidemic	10 countries	28646 cases, 11323 deaths <sup>70</sup>	2 billion \$ loss in Guinea, Liberia ve Sierra Leone <sup>71</sup>
2015	Zika virus	76 countries	2656 reported microcephaly central nervous system disorder <sup>61</sup>	7-18 billion \$ loss in Latin America and Caribbeans <sup>72</sup>

<sup>a</sup>The effects of studies about HIV/AIDS on gross national product per capita were a little. <sup>b</sup>The West African Ebola Epidemic was seen between 2013 and 2016, but in 2014, it peaked and international effects were observed. GNP: Gross national product, HIV/AIDS: Human immuno deficiency virus/acquired immuno deficiency syndrome, MERS: Middle east respiratory syndrome, SARS: Severe acute respiratory syndrome, reference<sup>6</sup>

TL, 3.74 for 10001 and above) were found to be higher than those of participants with other income levels (3.68 for those without a fixed income, 3.61 for minimum wage, 3.69 for 2000-4000 TL).

When the averages of affective, cognitive and behavioral attitudes were examined in terms of education level, it was seen that the averages of individuals who were primary school graduates were higher than the averages of those with other education levels. In addition, considering the affective dimension, it was seen that the average was above 4 for every education level except secondary school graduates.

While it was found that the average of the participants with COVID-19 positive individuals in their close environment was 4.18 in the affective dimension, 3.24 in the cognitive dimension, and 3.71 in the behavioral dimension, the average of the participants who did not have COVID-19 positive individuals in their close environment was 4.09 in the affective dimension, 3.24 in the cognitive dimension and 3.73 in the behavioral dimension.

In addition, although the general average of the affective dimension was 4.12, the general average of the cognitive dimension was 3.24, and the general average of the behavioral

dimension was 3.72, it was observed that the participants exhibited a positive attitude.

EFA results are given in Table 4.

According to Table 4, of the items that made up the affective dimension, for the item of affective (DUY1) "I have realized the meaning of life more", the factor load was 0.849 and the mean was 4.19; for the item of DUY2 "I have understood how valuable health is", the factor load was 0.814 and the mean was 4.40; for the item of DUY3 "My sensitivity to social issues has increased", the factor load was 0.788 and the mean was 4.03; for the item of DUY4 "I have realized that I should value the people I love more", the factor load was 0.703 and the mean was 3.97; for the item of DUY5 "I have understood the importance of the activities I did with my friends", the factor load was 0.659 and the mean was 4.18; for the item of DUY6 "I think that I will be a more sensitive individual in the future to events that I ignored in the past", the factor load was 0.619 and the mean was 3.98; and for the item of DUY7 "I was more worried about my close environment than myself", the factor load was found to be 0.568 and the mean was 4.07. In addition, the affective dimension factor explains 24.587% of the total variance. Of the items that made up the cognitive dimension, for the item of cognitive (BIL1) "My religious awareness has

**Table 2. Frequency and percentage values for the participants**

Demographic variables	Frequency	Percentage (%)
<b>Gender</b>		
Female	588	61.4
Male	370	38.6
<b>Age</b>		
19 years and below	55	5.7
20-29 years	373	38.9
30-39 years	199	20.8
40-49 years	150	15.7
50 years and above	181	18.9
<b>Income level</b>		
No fixed income	280	29.2
Minimum wage	39	4.1
2000-4000 TL	154	16.1
4001-7000 TL	368	38.4
7001-10000 TL	79	8.2
10001+	38	4.0
<b>Education level</b>		
Primary school	11	1.1
Secondary school	15	1.6
High school	124	12.9
Associate degree	79	8.2
Undergraduate degree	539	56.3
Graduate degree	190	19.8
<b>The presence of any individual with positive COVID-19 in close environment</b>		
No	702	73.3
Yes	256	26.7
Total	958	-
COVID-19: Coronavirus disease-2019		

increased", the factor load was 0.894 and the mean was 2.96; for the item of BIL2 "My commitment to my religion has increased", the factor load was 0.828 and the mean was 3.07; for the item of BIL3 "The importance I attach to material has decreased", the factor load was 0.735 and the mean was 3.24; for the item of BIL4 "I have once again questioned my purpose of life", the factor load was 0.727 and the mean was 3.36; and for the item of BIL5 "I have realized that money is not everything", the factor load was 0.639 and the mean was 3.58. In addition, the cognitive dimension factor explains 20.147% of the total variance. From the items that made up the behavioral dimension, for the item of behavioral (DAV1) "I have limited my expenses as much as possible", the factor load was 0.846 and the mean was 3.62; for the item of DAV2 "I have increased my economic measures", the factor load was 0.806 and the mean was 3.71; for the item of DAV3 "I have tried to keep my expenses under control", the factor load was 0.752 and the mean was 3.79; for the item of DAV4 "I have

avoided unnecessary shopping", the factor load was 0.600 and the mean was 3.49; for the item of DAV5 "I have provided my own transportation way instead of public transportation", the factor load was 0.551 and the mean was 4.02; for the item of DAV6 "I have paid attention to a healthy diet", the factor load was 0.545 and the mean was 3.72. The behavioral dimension factor explains 20.064% of the total variance. In addition, these 3 factors explain 64.798% of the total variance.

When Figure 1 is examined, it is seen that the most effective variable affecting the cognitive dimension factor is BIL4 "I have once again questioned my purpose of life" with a coefficient of 0.81. The cognitive dimension factor is affected by the item of BIL3 "The importance I attach to material has decreased" with a coefficient of 0.80, by the item of BIL1 "My religious awareness has increased" with a coefficient of 0.77, by the item of BIL5 "I have realized that money is not everything" with a coefficient of 0.68, and by the item of BIL2 "My commitment to my religion has increased" with a coefficient of 0.66. It is seen that it also fulfills the criterion of  $X^2/df=6.44/3=2.14 < 3$  which is among the criteria of goodness of fit.

According to Table 5, the composite reliability (CR) value of the cognitive dimension factor is 0.86 and the average variance extracted (AVE) value is 0.56. The CR value is expected to be greater than 0.70 and the AVE value to be greater than 0.50 and it is seen that the values calculated here are in accordance with these criteria.

When Figure 2 is examined, the most effective variable affecting the affective dimension factor is DUY1 "I have realized the meaning of life more" with a coefficient of 0.79. The affective dimension factor is affected by the item of DUY4 "I realized that I should value the people I love more" with a coefficient of 0.77, by the item of DUY2 "I have realized how valuable health is" with a coefficient of 0.75, by the item of DUY3 "My sensitivity to social issues has increased" with a coefficient of 0.74, by the item of DUY6 "I think that I will be a more sensitive individual in the future to events that I ignored in the past" with a coefficient of 0.72, by the item of DUY5 "I have understood the importance of the activities I did with my friends" with a coefficient of 0.69, and by the item of DUY7 "I was more worried about my close environment than myself" with a coefficient of 0.57. It is seen that it also fulfills the criterion of  $X^2/df=13.26/8=1.65 < 3$  which is among the criteria of goodness of fit.

According to Table 6, the CR value of the affective dimension factor is 0.88 and the AVE value is 0.52. The CR value is expected to be greater than 0.70 and the AVE value to be greater than 0.50 and it is seen that the values calculated here are in accordance with these criteria.

**Table 3. Descriptive statistics on demographic variables (arithmetic mean, standard deviation)**

Demographic variables	Affective		Cognitive		Behavioral	
	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation
<b>Gender</b>						
Female	4.21	0.79	3.33	1.12	3.75	0.96
Male	3.97	0.90	3.10	1.11	3.69	0.94
<b>Age</b>						
19 years and below	4.05	0.91	3.47	1.08	3.71	0.95
20-29 years	4.16	0.77	3.22	1.09	3.56	0.96
30-39 years	4.14	0.83	3.24	1.11	3.80	0.84
40-49 years	4.07	0.92	3.20	1.24	3.89	0.95
50 years and above	4.05	0.92	3.25	1.12	3.85	0.99
<b>Income level</b>						
No fixed income	4.14	0.72	3.27	1.10	3.68	0.86
Minimum wage	4.00	1.03	3.11	1.10	3.61	1.01
2000-4000 TL	4.08	0.95	3.25	1.21	3.69	1.05
4001-7000 TL	4.15	0.85	3.28	1.10	3.76	0.98
7001-10000 TL	4.08	0.81	3.14	1.01	3.84	0.87
10001+	4.00	1.05	2.81	1.29	3.74	0.94
<b>Education level</b>						
Primary school	4.45	0.56	4.29	0.80	4.67	0.48
Secondary school	3.86	1.23	3.24	1.38	3.74	1.09
High school	4.04	0.87	3.29	1.06	3.77	0.98
Associate degree	4.04	0.94	3.50	1.07	3.83	0.98
Undergraduate degree	4.12	0.86	3.18	1.13	3.68	0.96
Graduate degree	4.20	0.72	3.20	1.12	3.72	0.87
<b>The presence of any individual with positive COVID-19 in close environment</b>						
No	4.09	0.87	3.23	1.13	3.73	0.95
Yes	4.18	0.76	3.24	1.08	3.71	0.95
General average	4.12	0.84	3.24	1.12	3.72	0.95

COVID-19: Coronavirus disease-2019

When Figure 3 is examined, the most effective variable affecting the behavioral dimension factor is seen to be DAV1 "I have limited my expenses as much as possible" with a coefficient of 0.93. The behavioral dimension factor is affected by the item of DAV2 "I have increased my economic measures" with a coefficient of 0.84, by the item of DAV3 "I have tried to keep my expenses under control" with a coefficient of 0.74, by the item of DAV6 "I have paid attention to a healthy diet" with a coefficient of 0.74, by the item of DAV4 "I have avoided unnecessary shopping" with a coefficient of 0.54, and by the item of DAV5 "I have provided my own transportation way instead of public transportation" with a coefficient of 0.51.

It is seen that it also fulfills the criterion of  $X^2/df=12.75/5=2.55 < 3$ , which is among the criteria of goodness of fit.

According to Table 7, the CR value of the behavioral dimension factor is 0.87 and the AVE value is 0.54. The CR value is expected

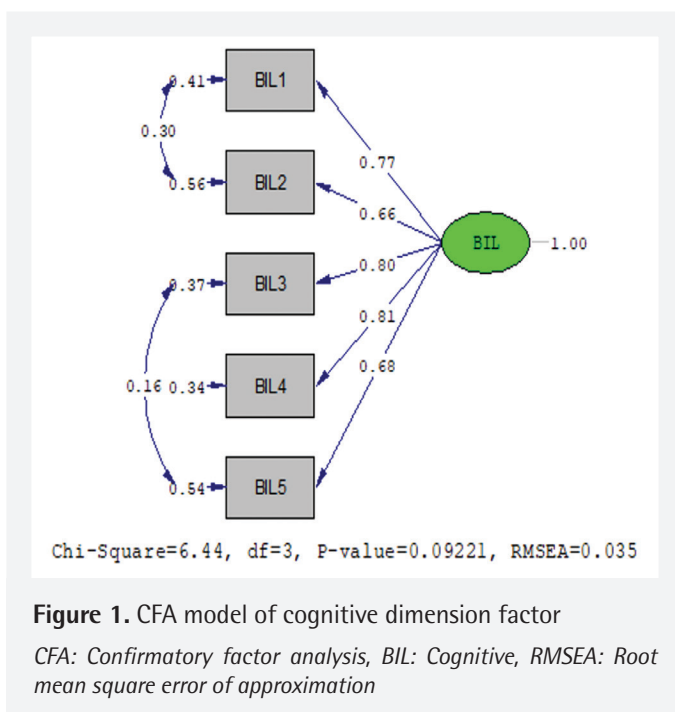
to be greater than 0.70 and the AVE value to be greater than 0.50 and it is seen that the values calculated here are suitable for these criteria.

According to Table 8, the root mean square error of approximation (RMSEA) (0.035), normed fit index (NFI) (1.00), non-normed fit index (NNFI) (1.00), comparative fit index (CFI) (1.00), standardized root mean square residual (SRMR) (0.0064), goodness of fit index (GFI) (1.00) and adjusted goodness of fit index (AGFI) (0.99) values of the cognitive dimension factor are within the limits of excellent goodness of fit. The RMSEA (0.026), NFI (1.00), NNFI (1.00), CFI (1.00), SRMR (0.0087), GFI (1.00) and AGFI (0.99) values of the affective dimension factor are within the limits of excellent goodness of fit. For the behavioral dimension factor, the values of RMSEA (0.040), NFI (1.00), NNFI (0.99), CFI (1.00), SRMR (0.015), GFI (1.00) and AGFI (0.98) are within the limits of excellent goodness of fit.



**Table 4. EFA, reliability analysis and descriptive statistics of the scale**

Factors/items	Factor loads	Total correlation for corrected items	Cronbach alpha value if item is deleted	$\bar{X} \pm SD$	
DUY eigenvalue: 8.357 Variance explanation rate: 24.587%					
DUY1	I have realized the meaning of life more	0.849	0.668	0.925	4.19±1.01
DUY2	I have understood how valuable health is	0.814	0.629	0.926	4.40±0.93
DUY3	My sensitivity to social issues has increased	0.788	0.611	0.926	4.03±1.06
DUY4	I have realized that I should value the people I love more	0.703	0.628	0.925	3.97±1.15
DUY5	I have understood the importance of the activities I did with my friends	0.659	0.682	0.924	4.18±1.05
DUY6	I think that I will be a more sensitive individual in the future to events that I ignored in the past	0.619	0.735	0.923	3.98±1.11
DUY7	I was more worried about my close environment than myself	0.568	0.544	0.927	4.07±1.19
BIL eigenvalue: 1.852 Variance explanation rate: 20.147%					
BIL1	My religious awareness has increased	0.864	0.598	0.926	2.96±1.39
BIL2	My commitment to my religion has increased	0.828	0.549	0.927	3.07±1.38
BIL3	The importance I attach to material has decreased	0.735	0.668	0.924	3.24±1.34
BIL4	I have once again questioned my purpose of life	0.727	0.657	0.925	3.36±1.37
BIL5	I have realized that money is not everything	0.639	0.665	0.924	3.58±1.33
DAV eigenvalue: 1.455 Variance explanation rate: 20.064%					
DAV1	I have limited my expenses as much as possible	0.846	0.642	0.925	3.62±1.22
DAV2	I have increased my economic measures	0.806	0.658	0.925	3.71±1.22
DAV3	I have tried to keep my expenses under control	0.752	0.698	0.924	3.79±1.20
DAV4	I have avoided unnecessary shopping	0.600	0.556	0.927	3.49±1.28
DAV5	I have provided my own transportation way instead of public transportation	0.551	0.531	0.928	4.02±1.27
DAV6	I have paid attention to a healthy diet	0.545	0.628	0.925	3.72±1.20
Total variance explanation rate: 64.798%					
SD: Standard deviation, DUY: Affective, BIL: Cognitive, DAV: Behavioral					



**Table 5. For the items of cognitive dimension factor, findings on  $\lambda$ , t value and CR and AVE values**

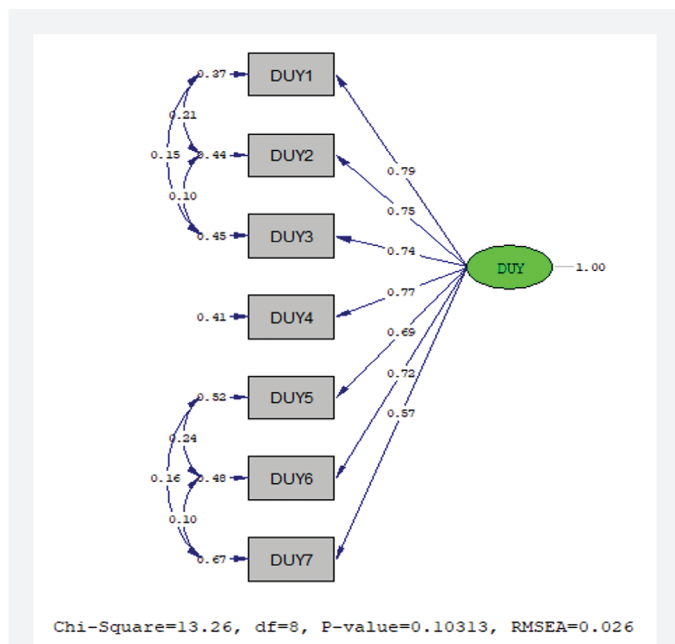
Latent variable	Observed variable	$\lambda$	t value	CR	AVE
BIL	-	-	-	0.86	0.56
	BIL1	0.77	25.67		
	BIL2	0.66	20.94		
	BIL3	0.80	26.72		
	BIL4	0.81	27.55		
	BIL5	0.68	21.28		

BIL: Cognitive, CR: Composite reliability, AVE: Average variance extracted

Level 2 CFA results of cognitive, affective and behavioral dimensions, which are sub-dimensions of attitude, are given in Figure 4.

The SEM model established with cognitive, affective and behavioral dimensions is given in Figure 5.

According to Figure 4, the most influential variable affecting the cognitive dimension factor was the item of BIL4 "I have



**Figure 2.** CFA model of affective dimension model  
 CFA: Confirmatory factor analysis, DUY: Affective, RMSEA: Root mean square error of approximation

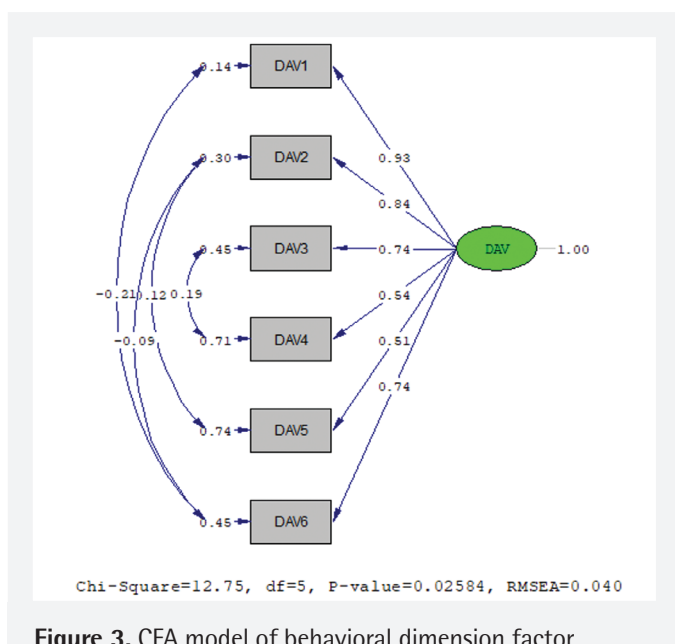
**Table 6. For the items of affective dimension factor, findings on  $\lambda$ , t value and CR and AVE values**

Latent variable	Observed variable	$\lambda$	t value	CR	AVE
DUY				0.88	0.52
	DUY1	0.79	26.02		
	DUY2	0.75	23.80		
	DUY3	0.74	23.49		
	DUY4	0.77	25.55		
	DUY5	0.69	22.16		
	DUY6	0.72	23.26		
	DUY7	0.57	17.30		

DUY: Affective, CR: Composite reliabilit, AVE: Average variance extracted

once again questioned my purpose of life" with a coefficient of 0.88. The cognitive dimension factor is affected by the item of BIL5 "I have realized that money is not everything" with a coefficient of 0.84, by the item of BIL3 "The importance I attach to material has decreased" with a coefficient of 0.83, by the item of BIL1 "My religious awareness has increased" with a coefficient of 0.66, and by the item of BIL2 "My commitment to my religion has increased" with a coefficient of 0.58.

It is seen that the most effective variable affecting the affective dimension factor is the item of DUY6 "I think that I will be a more sensitive individual in the future to events that I ignored in the past" with a coefficient of 0.80. The affective dimension factor is affected by the item of DUY1 "I have realized the meaning of life more" with a coefficient of 0.74, by the item



**Figure 3.** CFA model of behavioral dimension factor  
 CFA: Confirmatory factor analysis, DAV: Behavioral, RMSEA: Root mean square error of approximation

**Table 7. For the items of behavioral dimension factor, findings on  $\lambda$ , t value and CR and AVE values**

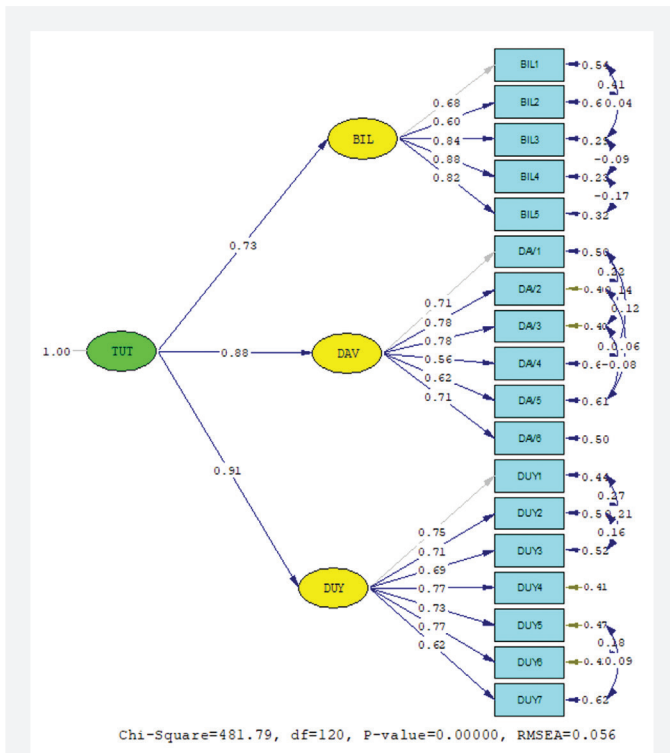
Latent variable	Observed variable	$\lambda$	t value	CR	AVE
DAV	-	-	-	0.87	0.54
	DAV1	0.93	35.00		
	DAV2	0.84	30.24		
	DAV3	0.74	26.04		
	DAV4	0.54	17.58		
	DAV5	0.51	16.61		
	DAV6	0.74	21.40		

DAV: Behavioral, CR: Composite reliabilit, AVE: Average variance extracted

**Table 8. Findings on the goodness-of-fit criteria of CFA models established for cognitive, affective and behavioral factors**

Goodness-of-fit criteria	Excellent fit	Acceptable fit	BIL	DUY	DAV
RMSEA	0 < RMSEA < 0.05	0.05 ≤ RMSEA ≤ 0.10	0.035	0.026	0.040
NFI	0.95 ≤ NFI ≤ 1	0.90 < NFI ≤ 0.95	1.00	1.00	1.00
NNFI	0.97 ≤ NNFI ≤ 1	0.95 ≤ NNFI ≤ 0.97	1.00	1.00	0.99
CFI	0.97 ≤ CFI ≤ 1	0.95 ≤ CFI ≤ 0.97	1.00	1.00	1.00
SRMR	0 ≤ SRMR < 0.05	0.05 ≤ SRMR ≤ 0.10	0.0064	0.0087	0.015
GFI	0.95 ≤ GFI ≤ 1	0.90 ≤ GFI ≤ 0.95	1.00	1.00	1.00
AGFI	0.90 ≤ AGFI ≤ 1	0.85 ≤ AGFI ≤ 0.90	0.99	0.99	0.98

CFA: Confirmatory factor analysis, BIL: Cognitive, DUY: Affective, DAV: Behavioral, RMSEA: Root mean square error of approximation, NFI: Normed fit index, NNFI: Non-normed fit index, CFI: Comparative fit index, SRMR: Standardized root mean square residual, GFI: Goodness of fit index, AGFI: Adjusted goodness of fit index

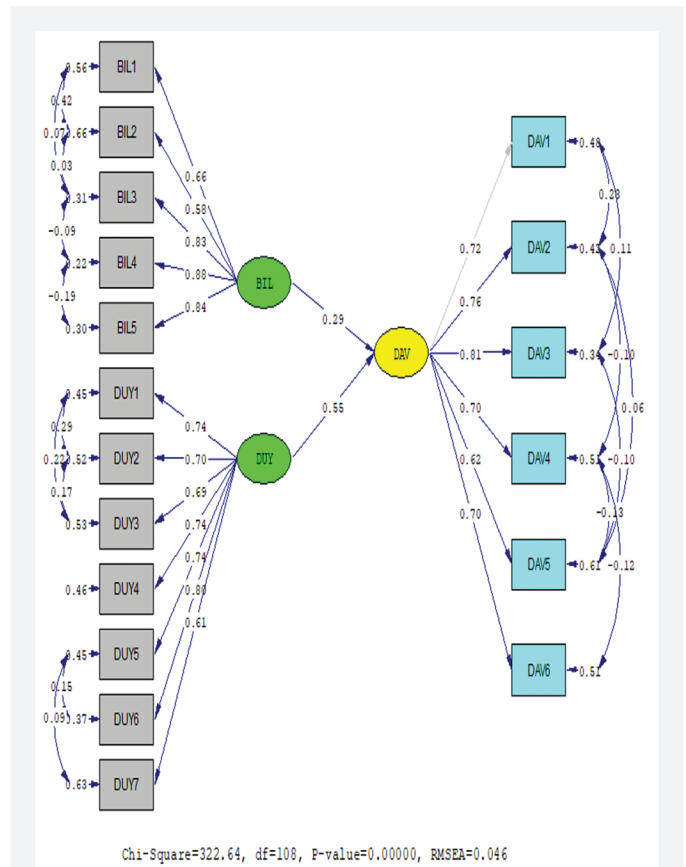


**Figure 4.** Second level confirmatory factor analysis results for cognitive, affective and behavioral dimensions  
*BIL: Cognitive, DUY: Affective, DAV: Behavioral, RMSEA: Root mean square error of approximation*

of DUY4 "I have realized that I should value the people I love more" with a coefficient of 0.74, by the item of DUY5 "I have understood the importance of the activities I did with my friends" with a coefficient of 0.74, by the item of DUY2 "I have understood how valuable health is" with a coefficient of 0.70, by the item of DUY3 "My sensitivity to social issues has increased" with a coefficient of 0.69, and by the item of "I was more worried about my close environment than myself" with a coefficient of 0.61.

With a coefficient of 0.81, the most influential variable affecting the behavioral dimension factor was DAV3 "I have tried to keep my expenses under control" The behavioral dimension factor is affected by the item of DAV2 "I have increased my economic measures" with a coefficient of 0.76, by the item of DAV1 "I have limited my expenses as much as possible" with a coefficient of 0.72, by the item of DAV6 "I have paid attention to a healthy diet" with a coefficient of 0.70, by the item of DAV4 "I have avoided unnecessary shopping" with a coefficient of 0.70, and by the item of DAV5 "I have provided my own transportation way instead of public transportation" with a coefficient of 0.62.

In addition, affective dimension (0.55) affects behavioral dimension more than cognitive dimension (0.29). It is seen that



**Figure 5.** SEM model established with cognitive, affective and behavioral dimensions  
*BIL: Cognitive, DUY: Affective, DAV: Behavioral, RMSEA: Root mean square error of approximation*

it meets the criterion of  $X^2/df=322.64/108=2.98 < 3$ , which is among the criteria for goodness of fit.

According to Table 9, the CR and AVE values are 0.87 and 0.59 for the cognitive dimension factor, 0.88 and 0.52 for the affective dimension factor, and 0.87 and 0.52 for the behavioral dimension factor. The CR value is expected to be greater than 0.70 and the AVE value to be greater than 0.50 and it is seen that the values calculated here are suitable for these criteria.

According to Table 10, the RMSEA (0.046), NFI (0.99), NNFI (0.99), CFI (0.99), SRMR (0.035), GFI (0.96) and AGFI (0.94) values of the SEM model are within the limits of excellent goodness of fit. On the other hand, the RMSEA (0.056) value of the attitude model is within the limits of acceptable goodness of fit, while the NFI (0.98), NNFI (0.98), CFI (0.99), SRMR (0.042), GFI (0.95) and AGFI (0.92) values are within the limits of excellent goodness of fit.

**Study Limitations**

The data set used in the study was obtained through a 5-point Likert-type scale (1 strongly disagree and 5 strongly agree) in

**Table 9. Findings on  $\lambda$ , t value, CR and AVE values for cognitive, affective and behavioral dimension factors**

Latent variable	Observed variable	$\lambda$	t value	CR	AVE
BIL	-	-	-	0.87	0.59
	BIL1	0.66	22.00		
	BIL2	0.58	18.89		
	BIL3	0.83	28.30		
	BIL4	0.88	28.05		
	BIL5	0.84	28.49		
DUY	DUY1	0.74	25.27	0.88	0.52
	DUY2	0.70	23.09		
	DUY3	0.69	22.71		
	DUY4	0.74	25.10		
	DUY5	0.74	25.19		
	DUY6	0.80	27.99		
	DUY7	0.61	19.73		
DAV	DAV1	0.72	27.14	0.87	0.52
	DAV2	0.76	29.08		
	DAV3	0.81	26.77		
	DAV4	0.70	18.90		
	DAV5	0.62	16.69		
	DAV6	0.70	19.84		

CR: Composite reliabilit, AVE: Average variance extracted, BIL: Cognitive, DUY: Affective, DAV: Behavioral

**Table 10. Findings related to goodness of fit criteria of SEM and attitude models**

Goodness-of-fit criteria	Excellent fit	Acceptable fit	SEM	Attitude
RMSEA	0 < RMSEA < 0.05	0.05 ≤ RMSEA ≤ 0.10	0.046	0.056
NFI	0.95 ≤ NFI ≤ 1	0.90 < NFI ≤ 0.95	0.99	0.98
NNFI	0.97 ≤ NNFI ≤ 1	0.95 ≤ NNFI ≤ 0.97	0.99	0.98
CFI	0.97 ≤ CFI ≤ 1	0.95 ≤ CFI ≤ 0.97	0.99	0.99
SRMR	0 ≤ SRMR < 0.05	0.05 ≤ SRMR ≤ 0.10	0.035	0.042
GFI	0.95 ≤ GFI ≤ 1	0.90 ≤ GFI ≤ 0.95	0.96	0.95
AGFI	0.90 ≤ AGFI ≤ 1	0.85 ≤ AGFI ≤ 0.90	0.94	0.92

SEM: Structural equation modeling, RMSEA: Root mean square error of approximation, NFI: Normed fit index, NNFI: Non-normed fit index, CFI: Comparative fit index, SRMR: Standardized root mean square residual, GFI: Goodness of fit index, AGFI: Adjusted goodness of fit index, reference<sup>73</sup>

addition to demographic questions, which was applied to a total of 958 individuals that could be reached across Turkey between 1-30 June 2020.

**DISCUSSION**

The negative effects of the COVID-19 pandemic, which is the biggest problem of today, on human life are increasing day by day. In this study, which was carried out on the observation that the attitudes of individuals in their previous lives differed during the pandemic period, the cognitive, affective and behavioral attitudes of individuals during the pandemic process, the relationships among these attitudes and the variables that affected the attitudes were examined.

It was determined that the affective dimension had the highest effect in the results of EFA, CFA and SEM analysis, which are among the statistical methods that are effective in examining the attitude of individuals towards an event with these sub-dimensions.

When the other findings obtained from the study were examined in terms of demographic characteristics, it was observed that, in the affective dimension, the averages of individuals who were women, aged 20-29 years, had an income level of 4001-7000 TL, had a primary school education level and those with individuals who were found to be positive for COVID-19 in their close environment were high. In terms of demographic characteristics in the cognitive dimension, it has been observed that the averages of women, those aged 19 years and under, those with an income level of 4001-7000 TL, those with primary school education level and those with individuals with positive COVID-19 in their close environment were high.

Finally, in terms of demographic characteristics in behavioral dimension, it was observed that the averages of individuals who were female, aged between 40 and 49 years, had an income level of 7001-10000 TL, were primary school graduates, and had individuals without positive COVID-19 in their surroundings were higher.

As a result of SEM, it is seen that an increase of one unit in the affective dimensions of individuals causes an effect of 0.55 units in the behavioral dimensions, and an increase of one unit in the cognitive dimensions causes an increase of 0.29 units in the behavioral dimension.

While "individuals' questioning their purpose of life again" was the most effective item in the cognitive dimension, it was determined that individuals would be more sensitive individuals in the future than in the past and would attach importance to economic measures according to the items that were effective in the affective and behavioral dimensions.

**CONCLUSION**

It should not be forgotten that, like many pandemics in the past, the COVID-19 pandemic is a temporary process, even

if it has negative effects on the attitudes and behaviors of individuals.

With the hope that the ongoing vaccine studies will yield positive results as soon as possible, all individuals should take responsibility for this pandemic to be overcome with the least damage for our country and the whole world humanity. In order to inform people about responsibilities, taking into account the results of this research, which is an attitude determination study, it is necessary to assimilate the causes and consequences of the changes in the attitudes and behaviors of individuals in this process to learn a lesson from all these experiences and make positive contributions to the future.

## Ethics

**Ethics Committee Approval:** Study was approved by the decision of Afyon Kocatepe University Scientific Research and Publication Ethics Committee dated 27.05.2020 and numbered 15.06.2020-E.17011.

**Informed Consent:** It is a survey study.

**Peer-review:** Externally peer-reviewed.

## Authorship Contributions

Concept: İ.B., M.A., Y.D., C.G., S.S., Design: B.İ., N.F., M.A., Y.D., C.G., S.S., Data Collection or Processing: B.T., M.D., Ş.B., C.G., S.S., Analysis or Interpretation: B.T., C.G., S.S., Literature Search: E.Ö., İ.B., B.İ., M.D., C.G., S.S., Writing: B.T., B.İ., M.D., N.F., Ş.B., C.G., S.S.

**Conflict of Interest:** No conflict of interest was declared by the authors.

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