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ORIGINAL ARTICLE / ORİJİNAL MAKALE

Investigation of attitudes and behaviors towards COVID-19 with theory of planned behavior

COVID-19'a Yönelik Tutum ve Davranışların Planlı Davranış Teorisiyle Araştırılması

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ABSTRACT

Objective: In the COVID-19 pandemic, it is necessary and crucial for local authorities to be aware of the prospective behavior and perception of individuals so that health authorities can effectively respond and be prepared for the pandemic. This study has focused on researching people's attitudes and behaviors towards COVID-19 within the context of theory of planned behavior (TPB). **Methods:** In the study, initially, a research model was designed within the scope of TPB, and then in order to analyze the relationships in the model, a data collection tool was developed. Ultimately, the fit of the proposed modeling and the test of hypotheses were conducted through using partial least squares structural equation modeling (PLS-SEM). **Result:** As a result of the research, it was found out that as the anxiety about COVID-19 soared the intention to go out was decreased, while the behavior of taking precautions increased. Also, it was indicated that as the intention of going out was decreased by one point, the behavior of taking measures against the transmission of COVID-19 increased by 0.28 points. **Conclusion:** In the study, it could be stated that the model proposed within the scope of TPB fits well with the perceived attitudes and behaviors towards COVID-19. It was determined that as the anxiety towards COVID-19 increased, the intention of going out was decreased and the behavior of taking measures increased.

Keywords: COVID-19, theory of planned behavior (TPB), anxiety, attitude, behavior.

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ÖZ

Amaç: COVID-19 pandemisinde, sağlık otoritelerinin etkili bir şekilde yanıt verebilmesi ve pandemiye hazırlıklı olabilmesi için yerel yetkililerin bireylerin olası davranış ve algılarının farkında olması gerekli ve çok önemlidir. Bu çalışma, Planlı Davranış Teorisi (PDT) bağlamında insanların COVID-19'a yönelik tutum ve davranışlarını araştırmaya odaklanmıştır. **Yöntem:** Çalışmada öncelikle PDT kapsamında bir araştırma modeli tasarlanmış ve ardından modeldeki ilişkileri analiz etmek için bir veri toplama aracı geliştirilmiştir. Sonunda önerilen modellemenin uyumu ve hipotez testi, kısmi en küçük kareler yapısal eşitlik modellemesi (KEKK-YEM) kullanılarak gerçekleştirilmiştir. **Bulgular:** Araştırma sonucunda COVID-19 endişesi arttıkça dışarı çıkma niyetinin azaldığı, önlem alma davranışının arttığı tespit edildi. Ayrıca dışarı çıkma niyeti bir puan azaldığı için COVID-19 bulaşına karşı önlem alma davranışının 0,28 puan arttığı belirlendi. **Sonuç:** Araştırmada, PDT kapsamında önerilen modelin COVID-19'a yönelik algılanan tutum ve davranışlarla uyumlu olduğu söylenebilir. COVID-19'a yönelik kaygı arttıkça dışarı çıkma niyetinin azaldığı ve önlem alma davranışının arttığı belirlendi.

Anahtar Kelimeler: COVID-19, planlı davranış teorisi (PDT), kaygı, tutum, davranış.

Introduction

Health behaviors of individuals, in the face of a threat of outbreak are crucial in terms of reducing the propagation speed of the epidemic and deaths. Due to the nature of the disease, people's perceptions are known to be effective on their responses to the disease, their compliance and behavior. [17,18,24]

In the COVID-19 pandemic, which affects the whole world, it is necessary and vital for local administrations to be informed about the behaviors and perceptions of individuals in order for health authorities to intervene effectively and get prepared. From this point of view, the Theory of Planned Behavior (TPB) can provide a useful framework for examining individuals' intentions.[3,4,26]

TPB is a theory, which forecasts the existence of a strong intention for a person to plan a certain behavior or to have an urgent priority.[4,6] The intensive usage of social media and communication sources (immediate environment, official sources) on the pandemic of COVID-19, has increased the anxiety and stress levels of the society.[12] At the same time, the information, which is obtained from these sources, plays a role in improving situational awareness for public health.[5] The practice of epidemic control, such as maintaining situational awareness and following quarantine rules, maintaining social distance, and the correct use of personal protective equipment (such as masks, gloves), is caused by the perception based on these sources of information. At this stage, the use and understanding of TPB theory is very important in ensuring reliable and accurate information and transforming this information into behavior.[27,28]

We know that people who are exposed to potential disease threats tend to develop avoidance behaviors and conform to social norms and rules. Public health emergencies lead to more negative emotions and cognitive evaluation in individuals and keep them away from potential pathogens.[22,29] Besides, since health authorities have been focusing on the treatment, control and effective vaccination of COVID-19 worldwide, individual perceptions and concerns have not yet been fully taken into consideration.[23]

It is vital in this sense to have a suitable measurement tool to reflect the behavior of the whole society.[2] A few study has been carried out, yet which reveals the thoughts, behaviors, anxiety and perceptions of the people with regard to the COVID-19 pandemic, which is still ongoing in Turkey and the transmission of which is rising. This study has focused on researching people's attitudes and behaviors towards COVID-19 within the context of theory of planned behavior (TPB). In addition, anxiety factor was added to the classical TPB model in the study and the relationships between anxiety and intention and behavior were investigated. In the study, initially, a research model was designed within the scope of TPB, and then in order to analyze the relationships in the model, a data collection tool was developed. Ultimately, the fit of the proposed modeling and the test of hypotheses were conducted through using partial least squares structural equation modeling (PLS-SEM).

Material and Methods

Data Collection and Sample

Data collection form which has been used in the study, consisted of 2 chapters including the premises, which assess the public's attitudes towards COVID-19, and demographic information. The demographic information chapter involves data about the participants such as gender, age, marital status, presence of a chronic disease, employment status (profession). In the second chapter, a 5-point Likert-type scale consisting of 20 premises in which attitudes towards COVID-19 are evaluated was employed. Attitude items were measured as (1-Never disagree, 5- Totally agree), and behavioral items (1-Never, 5-Always).

A sample volume which is 20 times more than the number of questions in the measure would be used in accordance with the literature knowledge, which was determined as a minimum of 480 individuals.19 The survey form was shared online via a link on social media on 5-7 April 2020. It was determined that 777 participants from 45 different cities filled the online questionnaire voluntarily. The study was carried out in accordance with the principles of the Helsinki Declaration. At the beginning of the survey, the participants agreed that they voluntarily participated in the survey and their data will be used in the study. Republic Turkey of Ministry of Health study was conducted 2020-06-10T19_47_21 approval number. The application of the study was deemed appropriate with the decision of the Ethics Committee of Eskişehir Osmangazi University Social and Human Sciences Ethics Committee, number 2020-09.

Validity and reliability

In the study, Explanatory Factor Analysis (EFA) was performed on 250 data to investigate the structures in the measurement tool, and a 6-factor structure (ANX: Anxiety: Items 19-21; ATT: Attitude: Items 13-15. BEH: Behavior: Items 22-26; INT: Intention: Items 16-18; PBC: Perceived Behavior Control: Items 10-12; SN: Social Norm: Items 7-9.) and a variance explained by 75% were determined. The sample adequacy criterion KMO value for EFA was found to be 0.65, and Bartlett's Test of Sphericity value was found to be statistically significant at 0.01 significance level, which indicates that significant factors may emerge from the research data. As a result of the Explanatory Factor Analysis (EFA), items 9, 10, 13, 18, 24, 25 and 26 were removed from the scale since their factor loads were below 0.30. As a result of the analyses, the measurement tool consisted of 13 items and a six-factor structure. All of the standardized factor loads calculated for EFA, were above 0.50 and statistically significant. Besides, the Cronbach's Alpha (α) internal consistency coefficient of the scale was calculated as 0.70. This value indicates that the internal consistency of the measuring tool is adequate.

The Research Model and Hypotheses

In this study it was aimed to examine the people's attitudes and behaviors towards COVID-19 within the context of theory of planned behavior (TPB). Moreover, anxiety factor was added to the classical TPB model by the researchers, and the relationship between anxiety and intention and behavior was attempted to be revealed. In this study,

it was aimed to account for the relationship, which would be descripted with the modeling, by using PLS-SEM analysis.

The proposed research model is inspired by the TPB. TPB is a theory of behavior, which was designed to explain and predict human behaviors about a particular subject. TPB asserts that three basic cognitive factors determine individual behavior. TPB argues that intent is shaped by the influence of attitudes and subjective norms.[4] In the TPB model, subjective norms are a function of beliefs that important others (e.g. close friends or family) approve or reject behavior. Perceived behavioral control involves the beliefs of the individual on the existence of factors that might hamper or facilitate their ability to conduct their behavior. The research model of the study, which has been discussed basically, is presented in Figure 1.

PLS-SEM was used in the analysis of data in the study. Although PLS-SEM is used particularly in situations that do not require small sampling and normal distribution assumption, it is different from classical SEM and comes to the forefront with its strong aspects. PLS-SEM is considered as a flexible modeling technique compared to other statistical analyzes.[7,32]

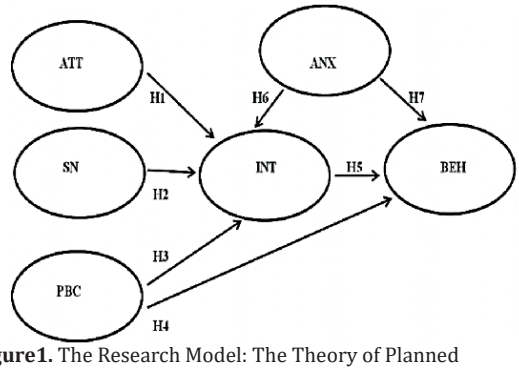

Figure1. The Research Model: The Theory of Planned Behavior Model for COVID-19
(**ANX:** Anxiety; **ATT:** Attitude; **BEH:** Behavior; **INT:** Intention; **PBC:** Perceived Behavior Control; **SN:** Social Norm)

That is to say, in cases where it is difficult or impossible to meet the assumptions (normal distribution assumptions) required in multivariate statistics, PLS-SEM is used. [35] Model validity and fit in PLS-SEM are assesses through using factor loads, path coefficients and VIF statistics.[20]

The research model was created within the scope of TPB. The model was tried to be enriched by adding the anxiety factor for the Covid-19 outbreak to the research model. In the study, the relationships between the negative attitude towards the epidemic, the social environment of the person and the perceived behavioral control intention to go out during the epidemic period were investigated within the scope of TPB. The hypotheses related to the research model were inspired by studies conducted by.[1,22,29] H6 and H7 hypotheses designed for the relationship of Anxiety and Intention with Behavior were put forward by the authors. The hypotheses created based on the research model are presented below:

H_1: There is a significant relationship between Attitude and Intention regarding COVID-19.
H_2: There is a significant relationship between Subjective Norm and Intention regarding COVID-19.
H_3: There is a significant relationship between Perceived Behavior Control and Intention regarding COVID-19.
H_4: There is a significant relationship between Perceived Behavior Control and Behavior regarding COVID-19.
H_5: There is a significant relationship between Intention and Behavior regarding COVID-19.

Anxiety can be defined as the emotional state that people experience in some periods. One of these periods is the epidemic processes experienced. People are psychologically affected by the epidemic during the epidemic processes, the loss of their lives due to the epidemic and the restrictions imposed on their lives. There have been many epidemics at certain times in the world. During and after these epidemic periods, it has been observed that even if the people are physically well, psychological problems continue after the epidemic. Today, the Covid-19 epidemic process, which started in December 2019, continues. This process is thought to

affect people psychologically. Especially by establishing a relationship between anxiety and intention factor, the effects of the level of anxiety in individuals on the intention of going out during the epidemic period and the behavior of taking precautions were tried to be investigated. For this purpose, H6 and H7 hypotheses have been proposed.

H_6: There is a significant relationship between Anxiety and Intention regarding COVID-19.

H_7: There is a significant relationship between Anxiety and Behavior regarding COVID-19.

Result

Participants from 45 different provinces of Turkey were included in the study. Demographic characteristics of the people participating in the research are presented in Table 1. The distribution of the answers given by the participants to the statements in the data collection tool is given in Table 2. The statements which more than 90% of participants stated that they agreed on are the items 9 and 13. The statements which more than 50% of the participants stated that they did not agree with are the items 18 and 23.

Table 1. Demographic Characteristics

	n	%
Gender		
Female	374	48.1
Male	403	51.9
Total	**777**	**100**
Age		
20-29	182	23.4
30-39	174	22.4
40-49	175	22.5
50-59	190	24.5
60+	56	7.2
Total	**777**	**100**
Marital Status		
Married	533	68.6
Single	244	31.4
Total	**777**	**100**
Employee Status		
Public employee	49	6.3
Private sector employee	179	23.0
Artisan	243	31.3
Retired	119	15.3
Not working	96	12.4
Looking for a job	30	3.9
Total	**777**	**100**
Whether it is a chronic disease		
Yes	162	20.4
No	615	79.6
Total	**777**	**100**

Data Analysis

In this research, SmartPLS 3.0 package program was used to analyze the data through PLS-SEM method.

First, the fit of the measurement model, then the fit of the structural model and the results of the hypothesis test were evaluated.

Validation of Measurement Model

Three criteria are generally used to ensure the Convergent Validity.

First, the standardized factor load of observed variables belonging to latent variables should be greater than 0.50 and statistically significant.[8] Secondly, the value of Structure Reliability (CR) and Cronbach Alpha (CA) is required to be greater than 0.70 for each structure.[14] As third, the Average Variance Extracted-AVE value of each latent variable is required to be higher than 0.50.[8]

Furthermore, it has been stated that AVE could be smaller than 0.50 in cases where the CR values of the relevant factor are greater than 0.70 and the construct validity is adequate.[14] CR and AVE values are presented collectively in Table 3.

Table 3. Construct Reliability and Validity

	Composite Reliability (CR)	Average Variance Extracted (AVE)
ANX	0.850	0.654
ATT	0.799	0.666
BEH	0.860	0.754
INT	0.966	0.934
PBC	0.906	0.827
SN	0.965	0.933

Table 2. Distribution of the answers given by the participants to the scale questions

	Disagree		Agree	
	n	%	n	%
7. I am considering the suggestions of my close circle to be protected from C19.	64	8.2	610	78.5
8. I follow what my family and my environment say to prevent C19 from infecting me.	58	7.5	637	81.9
9. I am following the scientists' suggestions to protect from C19	8	1.0	740	95.2
10. I trust my own level of knowledge to prevent contamination of C19.	71	7.9	569	73.2
11. I have full confidence in how I can handle it even if I caught the C19	135	17.4	423	54.5
12. My immune system for C19 is very strong, so I can handle it even if it gets infected.	171	22.0	314	40.4
13. C19 threatens all humanity	24	3.1	700	90.1
14. I think it can cause permanent damage to people who get C19 and recover later.	141	18.2	400	51.5
15 C19 will radically change human behavior towards individualization..	112	14.5	400	51.5
16. I intend to go out in the coming days, provided that I take my precautions..	374	48.2	257	33.1
17. I intend to shop at the markets by wearing a mask in the coming days.	159	20.5	480	61.7
18. As long as I take my precautions, I intend to use public transport in the coming days.	633	81.4	82	20.5
19. I am concerned that the C19 virus got into my family.	38	4.9	689	88.7
20 I worry that the people around me might die because of the C19 pandemic.	82	10.6	600	77.2
21. I am concerned that the possibility of not finding new drugs for the treatment of C19 disease.	149	19.2	417	62.7
22. I wear a mask on the street.	61	7.9	639	82.3
23 I wear gloves on the street..	359	54.4	200	30.2
24. I use public transportation.	278	35.7	370	46.7

When the structure reliability of the study was controlled, it was observed that CR values were 0.799 < CR< 0.966 and AVE values were greater than 0.65.

Factor loads determine the indicator reliability value, and when the loads are squared, the indicator reliability values are obtained. Since the factor loads, which are above 0.70, are preferred, factor loads are suitable for all items.

The discriminant validity of the measurement model is controlled through comparing the square root of the AVE value of each structure with the correlation between that structure and other structures. As a result of these comparisons, if the square root values of AVE are higher, then distinctive validity would be ensured.[8] The discriminant validity values of the model have been presented in Table 4. Besides, Heterotrait-Monotrait (HTMT) ratios were computed between 0.05 < HTMT < 0.38. Since HTMT ratios are less than 0.85, it could be stated that the model's separation validity is ensured.

Ultimately, in the evaluating of the model, it should be determined whether there is a multiple internal relationship (collinearity) between latent

variables. In order to realize this, VIF (variance inflation factor-variance bloating factor) values are examined. The fact that the VIF value is less than 5 indicates that there is no co-linearity between the variables.[15] VIF values for items ranged from 1.127 < VIF < 3.90, and between factors ranged from 1.026 < VIF < 1.159.

Table 4. Discriminant Validity

	ANX	ATT	BEH	INT
ANX	(0.809)			
ATT	0.232	(0.816)		
BEH	0.193	0.032	(0.869)	
INT	-0.076	0.169	-0.263	(0.967)
PBC	-0.154	0.049	0.021	0.259
SN	0.193	0.038	0.219	0.063

All of the computed VIF values are less than 5. Based on this finding, it can be said that there is no multiple internal relationship problem between latent variables.

Assessment of the Structural Model

The PLS-SEM result, which was used in testing the fit and mortgages of the model, has been presented in Figure 2.

Factor loads, coefficients, which shows the cause and effect relationship between the factors and the significance of these coefficients are presented in parentheses in Figure 2. In order to ensure that the model has acceptable fit, it is requested that the SRMR value is less than 0.10. SRMR value was calculated as 0.077 for the model. NFI value is expected to be between 0 and 1.

The NFI's being close to 1 indicates that the model has good fit. For the model of the study, NFI was calculated as 0.81. Results for the direct effects on the research model are presented in Table 5.

Data about the direct effect coefficients and the significance of these coefficients are presented in Table 3.

Table 5. Direct Effect Coefficients

	parameter estimation	t-Statistics	p value
ANX à BEH	0.191***	3.683	0.001
ANX àINT	-0.082*	1.670	0.095
ATT àINT	0.176***	3.399	0.001
INTà BEH	-0.280***	5.526	0.001
PBC à BEH	0.122**	2.273	0.023
PBC àINT	0.236***	4.711	0.001
SN à INT	0.006ns	0.089	0.929NS

*p<0.10;**p<0.05;p<0.01;NS:non-significant

While Anxiety à Beh (β=0.191; p<0.01) positively; Anxiety à Int (β= -0.08; p< 0.10) as negative. Att à Int (β=0.176; p<0.01) as positive. Int à Beh (β=-0.28; p<0.01) negatively; Pbc à Beh (β=0.122; p<0.05) positively. While Pbcà Int (β=0.236; p<0.05) positively, it was found to be there is no significant relationship Between Snà Int (β=0.006; p>0.05). As a result of the t test performed, all hypotheses except H2 were supported. Anx à Int = -0.08; Anx à Beh = 0.191 values means that an increase in anxiety level will result in a decrease of 0.08 points in intention to go out and an increase of 0.191 points in preventive behavior. Att à Int = 0.176 indicates that one-point increase in attitude towards COVID-19 will lead to an 0.176-point increase in the intention to go out. Pbc à Int = 0.236 means that one-point increase in perceived behavioral control will increase the intention of going out by 0.236 points, and Pbc à Beh = 0.122 by 0.122 points. In addition, -0.280 relationships were determined between IntàBeh. This value means that the one-point decrease in participants' intentions of going out due to COVID-19 will increase their precautionary behavior by 0.28 points.

Discussion

In this study, the perceived attitudes and behaviors towards COVID-19, an infectious disease, were examined with a data collection tool developed within the scope of TPB and a proposed structural model. The suitability of the proposed model was evaluated according to various fit criteria, and it can be stated that the model fit well.

The emergence of COVID-19 and its pandemic nature have increased fears and anxieties worldwide. This fear and anxiety are directly related to the rate of transmission of the disease, its invisible presence in the environment, its spread, morbidity and mortality.[13,30] Also, individual perceptions and concerns have not yet been fully taken into account since health authorities have been focusing on the treatment, control and effective vaccination of COVID-19 worldwide.[21,23] Even though no specific measurement tool for COVID-19 is used, studies in certain groups have contributed to the literature. [2,22,25,28,29, 33, 34]

It is crucial to put forward the psychological state of the public during the pandemic.[33] In a study examining the psychological impacts of the COVID-19 pandemic, it was revealed that negative emotions such as

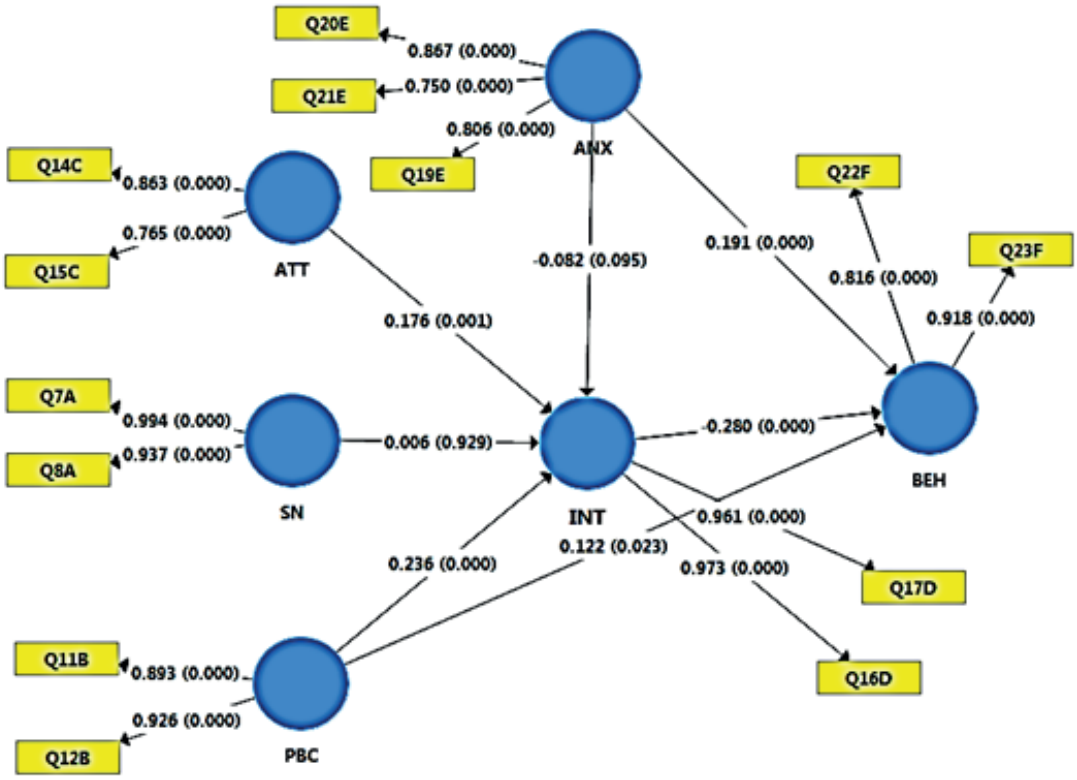

Figure 2. Structural Equation Model (PLS-SEM)

anxiety, anger, depression and sensitivity to social risks increased, and positive emotions and satisfaction scores declined. It was found out that people worry more about the health of themselves and their families and less worry about their other friends.[22]

Although public is an aware, anxiety level that affects the quality of life during epidemic diseases, including quarantine periods, are reported to continue in certain groups. Because of this, it is suggested that health education should be combined with psychological counseling for vulnerable individuals.[36]

In the study, in which almost 1000 people participated in Wuhan and Shanghai, the psychological and behavioral responses to COVID-19 during the soaring stage of the pandemic were reported to be dramatic. The timely dissemination of accurate and reliable information for high anxiety levels assisted their efforts.[22,29] The use and understanding of TPB theory are very crucial in providing reliable and accurate information on the pandemic and transforming this information into behavior. It has been stated in the study that the situational awareness of individuals increases in parallel with the adoption of health protective behaviors and practices.[27,28]

In the study, thoughts of participants that people in the immediate environment might die due to the C19 pandemic and having anxiety about the possibility of not

finding new drugs for the treatment of this disease, increased their behavior towards taking measures against the pandemic, while reducing their intention to go out.

The fact that the participants think that individuals who are infected with C19 and later recover, may lead to permanent damage and that they will have individualization situations after the pandemic, in briefly having a negative attitude, iWncreases their intention to go out on the streets with taking precautions during the epidemic also. People's definite conviction that they will overcome in case of being infected with C19 and the belief that they can overcome this disease with their immune system, affect their intention to go out and behavior of taking measures positively. In this study, it has been found out that there is a negative correlation between the intention and behavior towards C19. The decrease in the people's intention to go out and shopping at markets, increase their intention to take measures while going out, such as wearing masks, gloves, etc. Accordingly, it was determined that anxiety about COVID-19 had an effect on the intention and behavior with regard to C19.

Conclusion

In the study, it can be said that the perceived attitudes and behaviors towards COVID-19 fit well within the concept of TPB model. It was determined that as the anxiety towards COVID-19 increased, the intention of going out was decreased and the behavior of taking measures increased. Besides, it has been revealed that perceived behavioral control positively affects intention and behavior, and the behavior of taking measurements in people with a high intention of going out decreases. The study is a research that puts forward the effect of people's attitudes and anxieties on the behavior of the ongoing COVID-19 pandemic. In this study, additional anxiety factor to the classical TPB model related to COVID-19 pandemic was discussed. In future studies, new factors, which may affect the behaviors of the society towards the pandemic of C19, can be examined by adding different factors to the model. TPB models can be used in future COVID-19 research designs. Different variables can be added to TPB models. It may be appropriate to use this model to create communication strategies with the community during the epidemic process.

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Ethical Declaration: The application of the study was deemed appropriate with the decision of the Ethics Committee of Eskişehir Osmangazi University Social and Human Sciences Ethics Committee, number 2020-09.

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Conflict of Interest: There is no conflict interest

References

1. Agarwal V. A/H1N1 Vaccine Intentions in College Students: An Application of the Theory of Planned Behavior. Journal of American College Health 2014; 62(6): 416-424. http://dx.doi.org/10.1080/07448481.2014.917650
2. Ahorsu DK, Lin CY, Imani V, Saffari M, Griffiths MD, Pakpour AH. The Fear of COVID-19 Scale: Development and Initial Validation. Int J Ment Health Addict 2020; 27: 1-9. http://dx.doi.org/10.1007/s11469-020-00270-8.
3. Armitage CJ, Conner M. Distinguishing perceptions of control from self-efficacy: predicting consumption of a low-fat diet using the theory of planned behavior. J Appl Soc Psychol. 1999; 29: 72–90. https://doi.org/10.1111/j.1559-1816.1999.tb01375.x.
4. AjzenI. The theory of planned behavior. Organ Behav Hum Decis Process 1991; 50: 179–211.
5. Bandura A. Health promotion from the perspective of social cognitive theory. Psychol Health 1998; 13(4):623-649.
6. Cornally N, Ann Deasy E, McCarthey G, et al. Student nurses' intention to get the influenza vaccine. Br J Nurs. 2013; 22: 1207–1211.

7. Fornell C, Bookstein FA comparison analysis of two structural equation models: Lisrel and pls applied to market data. In C. Fornell (Ed.), A Second Generation of Multivariate Analysis (pp. 290–312). New York: Greenwood, 1982.
8. Fornell C, Lacker DF. Evaluating structural equation models with unobservable variables and measurement error. Journal of Marketing Research 1981;18: 39-50.
9. Fornell C. A national customer satisfaction barometer: the Swedish experience. Journal of Marketing 1992; 56(1): 6–21.
10. Fornell C, Cha J. Partial least squares, In R. Bagozzi (Ed.), Advanced methods of marketing, 52-78. Cambridge: Blackwell, 1994.
11. Fornell C, Johnson M, Anderson E-W, Cha J, Bryant B.E. The American Customer Satisfaction Index: Nature, Purpose, and Findings. Journal of Marketing 1996; 60(4): 7-18.
12. Garfin DR, Silver RC, Holman EA. The novel coronavirus (COVID-2019) outbreak: Amplification of public health consequences by media exposure. Health Psychol. 2020; doi: 10.1037/hea0000875.
13. Gritsenko V, Skugarevsky O, Konstantinov V, Khamenka N, Marinova T, Reznik A, Isralowitz R. (2020). COVID 19 Fear, Stress, Anxiety, and Substance Use Among Russian and Belarusian University Students. International Journal of Mental Health and Addiction. https://doi.org/10.1007/s11469-020-00330-z.
14. Hair Joseph F, Tatham R.L, Anderson R-E, Black W. Multivariate data analysis with readings. 5th Edn. Englewood Cliffs, NJ: Prentice Hall,1998.
15. Hair JF, Ringle CM, Sarstedt M. PLS-SEM: Indeed a silver bullet. The Journal of Marketing Theory and Practice 2011; 19(2): 139-152.
16. Hair JF, Hult G, Tomas M, Ringle C- M, Sarstedt M. A primer on partial least squares structural equation modeling (PLS-SEM). SAGE Publications, Inc., 2013.
17. Hekler EB, Lambert J, Leventhal E, Leventhal H, Jahn E, Contrada RJ. Commonsense illness beliefs, adherence behaviors, and hypertension control among African Americans. Journal of Behavioral Medicine (2008), 31: 391-400.
18. Hagger M.S, Orbell S. A meta-analytic review of the common-sense model of illness representations. Psychology and Health 2003: 18: 141-184.
19. Jung S. Exploratory factor analysis with small sample sizes: acomparison of three approaches. Behav Proceses (2013), 97: 90-95.
20. Kline R.B. Principles and Practice of Structural Equation Modeling. Guilford Press, New York, 2011.
21. Kumar A, Nayar R. COVID 19 and its mental health consequences. Journal of Mental Health 2020. https://doi.org/10.1080/09638237.2020.1757052.
22. Li S, Wang Y, Xue J, Zhao N, Zhu T. The Impact of COVID-19 Epidemic Declaration on Psychological Consequences: A Study on Active Weibo Users. International Journal of Environmental Research and Public Health 2020; 17: 2032; https://doi.org/10.3390/ijerph17062032.
23. Lin C-Y. Social reaction to ward the 2019 novel coronavirus (COVID-19). Social Health and Behavior 2020; 3(1):1–2.
24. Marčinko D, Jakovljević M, Jakšić N, Bjedov S, Mindoljević D. A. The Importance of Psychodynamic Approach during COVID-19 Pandemic. Psychiatr Danub. 2020, 32(1):15-21. https://doi.org/10.24869/psyd.2020.15.
25. Meng R, Li J, Wang Z, Zhang D, Liu B, Luo Y, Hu Y, Yu C. The Chinese version of the Perceived Stress Questionnaire: development and validation amongst medical students and workers. Health Qual Life Outcomes 2020 ; 18(1):70. https://doi.org/ 10.1186/s12955-020-01307-1.
26. Myers LB, Goodwin R. Using a theoretical framework to determine adults' intention to vaccinate against pandemic swine flu tin priority groups in the UK. Public Health 2012, 126: 53–56. https://doi.org/10.1016/j.puhe.2012.05.024.

27. Qazi A, Qazi J, Naseer K, Zeeshan M, Hardaker G, Maitama JZ, Haruna K. Analyzing situational awareness through public opinion to predict adoption of social distancing amid pandemic COVID-19. J Med Virol. 2020; Apr 8. https://doi.org/ 10.1002/jmv.25840.28
28. Qazi A, Tamjidyamcholo A, Raj RG, Hardaker G, Standing C. Assessing. consumers' satisfaction and expectations through online opinions: expectation and disconfirmation approach. Comput Human Behav. (2017); 75: 450-460.
29. .Qian M, Wu Q, Wu P. et al. Psychological responses, behavioral changes and public perceptions during the early phase of the COVID-19 outbreak in China: a population based cross-sectional survey. Journal of Medical Virology 2020. https://doi.org/10.1101/2020.02.18.20024448.
30. Satici B, Gocet-Tekin E, Deniz ME, & Satici S. A. Adaptation of the Fear of COVID-19 Scale: Its Association with Psychological Distress and Life Satisfaction in Turkey. International Journal of Mental Health and Addiction 2020. https://doi.org/10.1007/s11469-020-00294-0.
31. Schermelleh- Engel-K, Moosbrugger H. Evaluating The Fit Of Structural Equation Models: Test Of Significance And Descriptive Goodness Of-Fit Measures, Methods of Psychological Research-Online 2003; 8(2): 23-74
32. Schneeweiß, H. Models with latent variables: LISREL versus PLS. Statistica Neerlandica, 1991; 45(2): 145–157.
33. Wang Y, Di Y, Ye J, Wei W. Study on the public psychological states and its related factors during the outbreak of coronavirus disease 2019 (COVID-19) in some regions of China. Psychology, Health & Medicine 2020. https://doi.org/10.1080/13548506.2020.1746817.
34. Wu JT, Leung K, Leung GM. Nowcasting and forecastingthe potential domestic and intirnational spread ofthe 2019-nCoV outbreak originating in Wuhan, China:a modelling study Lancet 2020; 395:689-697.
35. Vinzi VE, Trinchera L, Amato S. PLS path modeling: from foundations to recent developments and open issues for model assessment and improvement. In: V. Esposito Vinzi, 2010.
36. Yuan S, Liao Z, Huang H, Jiang B, Zhang X, Wang Y, Zhao M. Comparison of the Indicators of Psychological Stress in the Population of Hube, 2020.
37. Province and Non-Endemic Provinces in China During Two Weeks During the Coronavirus Disease 2019 (COVID-19) Outbreak in February 2020. Med Sci Monit. 2020;26. https://doi.org/10.12659/MSM.923767