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Adaptation After Covid-19 Scale: The Study of Validity And Reliability

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Abstract

This study aims to conduct validity and reliability studies of the Adaptation After COVID-19 Scale (AACS) to measure adults' perceptions of adapting to life after COVID-19. The research study group consists of 2,042 adults who were accessed in July 2020 using convenience sampling. Half of this group was used in the exploratory factor analysis (EFA) and the other half in the confirmatory factor analysis (CFA). As a result of the two-step EFA analysis conducted in the validity studies, the scale was revealed to have 18 items with two factors explaining 50.37% of the total variance whose eigen values are greater than 1.00. However, because the difference between the first factor and the second factor is very large (42.68%), the scale has been evaluated as having one factor. In the second study group for the CFA after the modification procedures, the model showed good fit (x^2/df = 3.62; p <.001), and the other fit-indices of the model (*RMSEA* = .06; *RMR* = .05; *NFI* = .96; *CFI* = .97; *GFI* = .96; *AGFI* = .92) were found to be within acceptable ranges. In the reliability analyses, Cronbach's alpha of internal consistency has been determined as α = .94, the Guttman variable as *G* = .97; Spearman-Brown predicted reliability as *SB* = .97; split-half reliability as $r_{1\text{-}2}$ = .94; and test-retest reliability as *r* = .87. As a result, the study reveals the AACS to be acceptable as a valid and reliable scale.

Key Words

Adaptation After Covid-19 Scale • Covid-19 • Pandemic • Pandemic psychology • Corona

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The world has been going through a pandemic that has had psychological, sociological and economic consequences for people. Possibly fatal effects of the pandemic have forced people all around the world to transition into a life style they have never experienced before. The pandemic has some characteristics beyond being a disease with physical symptoms. It has had similar psychological effects on not only those who caught the disease, but also on the population who did not. Since the beginning of the pandemic, numerous articles have been written not only on the medical examination of the pandemic but also on its psychological effects on people. The lack of sufficient records on the previous pandemics limits the reference materials on the subject. It is evident that any kind of study and research on this subject will be a guiding light in managing pandemics that may emerge in the future.

People's reactions to crises are shaped by various factors. For instance, factors such as poor mental health, having relatives who got sick or died, working at a job that puts the individual at a constant life-threatening risk*, panic, being separated from family, having low-income etc. increase the chances of being negatively affected by the crisis (Duan & Zhu, 2020). Previous global crises were better managed by countries that had better crisis management plans. It shows how important it is to preplan actions to be taken before, during and after a crisis in order to anticipate negative situations that may ensue, take necessary precautions and implement the required interventions. For instance, various methods for helping people were tested in the previous viral outbreaks in China, such as telephone support lines (Duan, Zhu, 2020). Western countries also prepared a variety of broadcasts for psychological interventions during emergency situations that involve public health (World Healt Organization [WHO], 2020). However, adaptation of individuals after a crisis is as essential an issue as psychological intervention during a crisis.

The pandemic is progressing with the emphasis that the way of survival for people is through social isolation and is causing changes in the familiar life routines of humans, who otherwise tend to be social beings. Psychological effects of the feeling of isolation have been recognized through various studies conducted all over the world (Qiu et al., 2020). The life-threatening aspect of the pandemic has necessitated a quick acquirement of survival behaviors that go beyond self-protection. Behaviors that could have been perceived as compulsive behaviors before the pandemic such as frequent handwashing, wearing a mask, using gloves, avoiding contact with surfaces and objects have been encouraged and reinforced by powerful sources such as media, school, and family due to the nature of the pandemic. This includes the emphasis on the danger of going outside. As a result, many studies conducted during the pandemic in various countries report frequent cases of panic disorder, anxiety, and depression (Qiu et al., 2020).

It is likely that the effects of these problems have turned into corona anxiety and will continue to exist after the days of Covid-19 thus necessitating precautions to be taken by mental health workers. According to the Behavioral Immune System theory, in this kind of situations people tend to develop negative emotions and negative cognitive appraisals that are aimed at self-protection such as avoidance, refraining from forming social relations, avoiding people that display symptoms of disease, anxiety, strictly conforming to social norms (conformity). While these types of behaviors may help individuals protect themselves from the disease, long-term negative moods lower individuals' immune functions and damage their normal psychological mechanisms (Li et al., 2020; Terrizzi et al., 2013). In fact, studies on epidemic diseases show that people may experience cognitive distortions such as thinking

they will get sick or even die, despair, blaming those who get sick, and psychiatric symptoms such as anxiety, depression, somatic disorders, panic attacks, PTSD, or even suicidal tendencies (Ho et al., 2020).

It is certainly expected for a pandemic of an unprecedented scale that affects the whole world and can be fatal in some cases to have negative effects on human psychology. However, it is an issue of concern to what extent normalization can be achieved, and to what extent the behaviors that did not exist and in some cases were not considered normal within the normal life style before the pandemic will turn into habits after it ends. It is for future to answer how persistent the behaviors caused by anxiety and fear will be and for how long. Nevertheless, conducting studies on issues such as to what extend individual adaptation may be achieved and what kinds of anxiety and fears may be permanent will be instructive for the measures needed to be taken by professional service areas such as psychology, sociology or social services. It is evident that the effective management of situations that affect the psychology of large masses is only possible through effective social policy making by countries (Li et al., 2020).

It appears that the number of studies on the psychological effects of the pandemic worldwide are swiftly increasing. However, there do not seem to be many studies about the after-effects of the pandemic or behaviors that may persist afterwards. Yet, it is thought that such a study would be important in determining groups that may be at risk, especially after the pandemic (Li et al., 2020).

When scales used in studies on Covid-19 period are considered, it appears that there is a common tendency to use anxiety scales to measure the anxiety caused by Covid-19 as well as scales measuring depression and stress levels in individuals (Cao et al., 2020; Wang et al., 2020a). It is seen that a group of scale studies have been conducted on fear of Covid-19 and anxiety of Covid-19 (Ahorsu et al., 2020; Conway et al., 2020; Pakpour & Griffiths, 2020; Tan et al., 2020). There are also studies that measure the mental health of the general population during Covid-19. For instance, a longitudinal study that was conducted in China tracked the mental health of the public during coronavirus period (Wang et al., 2020b). However, there do not seem to be any scale study on adaptation, normalization and returning to life after Covid-19. It is a matter of curiosity whether the pre-Covid-19 and post-Covid-19 life attributions of the Covid-19 period within the perceptional framework will make certain habits that did not previously exist in individuals' lives permanent after the pandemic. Questions about whether the close-distance social interaction habits of eastern societies will change, how much behaviors that were reinforced during the Covid-19 days such as frequent and even constant hand washing and sterilization will return to normal, and to what extent the online life spent at home will have been adopted occupy the minds of researchers. When we look into the theories that may shed a light on these issues, Adaptation Level Theory stands out (Helson, 1947). According to this theory, which examines the adaptation and adjustment levels of individuals after adverse experiences, the individual eventually gets used to any circumstance that may have been perceived as unfavorable at first. Subjective well-being of the individuals depends on how they evaluate the situations, incidents and circumstances they are in. In the current social context, the traumatic experience we are going through is met with panic by individuals and the conditions of protection are shaped by behaviors which would have been considered as abnormal before the pandemic such as refraining from going outside the house and excessive hand washing. However, determining to what extent these behaviors can be eliminated and how long it would take will shed light on future studies. The still ongoing process of

pandemic can be monitored by comparing the measurements to be taken during the problem with the measurements to be gradually taken after the problem, thus assessing both society's and the individuals' adaptation skills.

The question of whether people's perceptions of pre-Covid-19 and post-Covid-19 will continue after the pandemic, how much normalization at the perceptual level will be possible will play a determining role in what measures and studies should be carried out by mental health workers working on this issue. To that end, it is the aim of this study to develop a valid and reliable measurement instrument aimed at determining the possible problems that can be encountered during the back-to-normal-life phase after Covid-19.

Method

Under this heading, information about the research model, population and sample, measurement instruments that were used, data collection and data analysis are presented.

Research Model

The research is a scale development study in terms of its structure. A post-Covid-19 adaptation scale was developed that can be applied to adults at the end of the study. On the other hand, comparisons of scores between various demographic variables, which can be an indicator of the construct validity of the scale, are also included.

Study Group

The general population of the study is adults aged 18 and above residing in Istanbul. A total of 2042 people from this population, who were reached online on social media platforms via the convenience sampling method, form the study group of the research. One half of this group was used in EFA analysis, and the other half in CFA analysis. The table summarizing the status of the study group in terms of various variables is presented below.

Table 1

Descriptive Values Regarding the Demographic Structure of the Sample

Variable	Groups	*f*	%	Variable	Groups	*f*	%
Age	20 and below	142	13.9	Educational Status	High School Graduate	82	8.0
	21-29	449	44.0		Undergraduate Student	364	35.7
	30-39	213	20.9		Graduate	374	36.6
	40-49	133	13.0		Postgraduate Student	49	4.8

	50-59	64	6.3
	Over 60	20	2.0
	Total	1021	100.0
Perceived Level of Income	Below Average	157	15.4
	Average	636	62.3
	Above Average	194	19.0
		34	3.3
	Total	1021	100.0

	Postgraduate	152	14.9
	Total	1021	100.0
Sex	Female	881	86.3
	Male	140	13.7
	Total	1021	100.0
Work Status During Pandemic	I worked	126	12.3
	I stayed home	895	87.7
	Total	1021	100.0

Data Collection Tools

Besides "Post-Covid-19 Adaptation Scale" (PCAS), which was developed within the scope of the research, the personal information form was used in order to determine certain demographic features of the individuals participating in the research.

Personal Information Form

It was prepared for the purpose of obtaining five pieces of personal information such as age, gender, perceived income level, educational status and work status during the pandemic.

Post-Covid-19 Adaptation Scale (PCAS)

The scale was developed by the researchers within the scope of the research. Explanations concerning the development process of the scale are given below.

PCAS Item Preparation and Validity-Reliability Analysis

The scale is a 5-point Likert type graded between "1 - I strongly disagree" – "5 - I strongly agree". Initially, an autobiographical exercise was conducted with 25 individuals, a literature review was made, and the scales used in similar studies were examined, after which 30 items aimed at determining the perception of individuals about the post-corona adaptation process were prepared. After the Lawshe analysis based on the opinions of 11 members of the expert group (consisting of 2 assessment and evaluation experts, 8 psychological counseling and guidance experts, 1 family physician) was done, the items of the candidate scale dropped to 22, 10 of which were reversed items and 12 straightforward items. With this form, a pilot study was conducted on a data group of 53 people, and language and

spelling corrections were made based on the feedback received. the process of data collection for the purpose of developing the scale was initiated with this item group.

Data Collection

The data were collected in two steps: for the development of the scale and the research itself. An online database was designed to be used during the data collection process, enabling participants to fill out the personal information form and scale items online. After that, the research was introduced via various internet groups and social media communication tools and participation was encouraged. It was observed in the pilot study that the exercise took 12-15 minutes to complete.

Data Analysis

In data analysis, firstly the exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) results, which reveal the construct validity, and then the findings regarding the other complementary analyses were included. In addition, comparative analyses supporting the construct validity of the instrument were also included. To that end, descriptive statistics obtained from the scale such as the mean and the standard deviation were calculated and the perceptions of the people were revealed. Afterwards, skewness and kurtosis values were calculated for the analyses to be made in order to deal with the problematic aspects of the research, and then hypotheses were tested through the independent groups t-test and one-dimensional analysis of variance.

Results

In this section, the results obtained from the validity and reliability analyses of the Post-Covid-19 Scale (PCAS) based on the data at hand, and the results of the analysis comparing the scale scores between various demographic variable groups were included.

Validity and reliability are necessary for converting values whose structures cannot be observed directly into structural forms through measurements (Neuman, 2014, 276). First Exploratory Factor Analysis (EFA) and then Confirmatory Factor Analysis (CFA) were performed in order to test the construct validity of the data collection tool. Factor analysis is basically transforming complex structures into explainable structures (Altunışık et al., 2004, 222). The first thing to do while performing a factor analysis is to decide how to determine the number factors. While eigen cutoff value was set as 2.00, aiming to make the structure stronger, axis rotation number (iteration) was decided as 25 and varimax vertical rotation method was preferred. Lower cutoff point of the variance of the factor loads was established as .40. After making these preferences, EFA was performed on 22 items, results of which is given below.

Table 2

KMO, Bartlett's Test Results and Values for Communalities

Items	EFA 1		EFA 2	
	Initial	**Ext.**	**Initial**	**Ext.**
Item1.	1.00	.471	1.00	.481
Item 2.	1.00	.514	1.00	.528
Item 3.	1.00	.453	1.00	.451
Item 4.	1.00	.343	-	-
Item 5.	1.00	.431	1.00	.441
Item 6.	1.00	.570	1.00	.590
Item 7.	1.00	.510	1.00	.518
Item 8.	1.00	.427	1.00	.404
Item 9.	1.00	.627	1.00	.627
Item 10.	1.00	.655	1.00	.661
Item 11.	1.00	.651	1.00	.643
Item 12.	1.00	.471	1.00	.460
Item 13.	1.00	.314	-	-
Item 14.	1.00	.590	1.00	.598
Item 15.	1.00	.347	-	-
Item 16.	1.00	.480	1.00	.477
Item 17.	1.00	.416	1.00	.423
Item 18.	1.00	.471	1.00	.470
Item 19.	1.00	.549	1.00	.550
Item 20.	1.00	.547	1.00	.567
Item 21.	1.00	.593	1.00	.606
Item 22.	1.00	.115	-	-
KMO	.94		.95	
Bartlett	9326.43 / p=.000		8808.78/ p=.000	

As seen in Table 2, Kaiser-Meyer-Olkin (KMO=.94) and Bartlett (=9326.43; .001) values in factor analysis at all stages show that the data are excellent in terms of factorability. According to Sipahi, Yurtkoru and Çinko (2008), a KMO value greater than .80 indicates that the scale is excellent in terms of factorability. On the other hand, four items whose communalities value was less than 0.40 were eliminated, and since all the items had a value above .40 after the second stage, the process was continued with the remaining 18 items without repeating EFA. Below is the scree plot* that shows the factor groups and percentages of total variance explained after the second stage EFA.

Table 3

Total Amount of Variance Explained

Factor	**Initial Eigenvalues**			**Total Factor Loads**		
	Total	**% Var.**	**Cum.%**	**Total**	**% Var.**	**Cum.%**
1	9.07	50.37	50.37	9.07	50.37	50.37
2	1.38	7.69	58.06			
3	.92	5.08	63.14			
4	.74	4.12	67.26			
5	.72	4.00	71.26			
…	...	...	...			
18	.22	1.25	100.00			

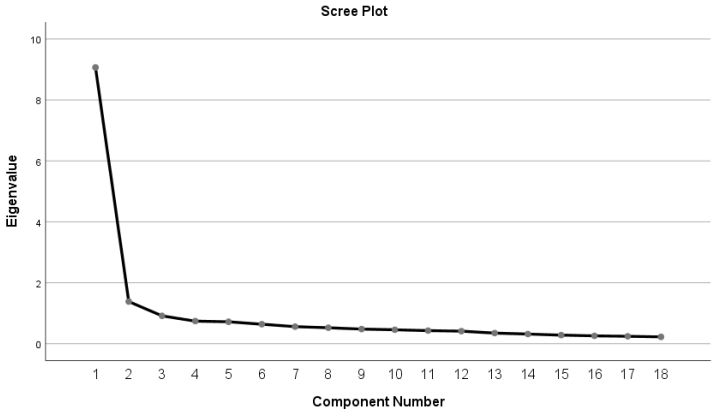

Figure 1. Scree Plot for the EFA 2

As seen in Table 3, the single factor structure with 18 items revealed at the end of the EFA accumulated in a factor with an eigen value greater than 2, and this single factor explains approximately 50.37% of the 9 total variances with a factor load of 9.07. On the other hand, when the scree plot was examined, it was seen that the trend turned horizontal after the first factor, so it was decided to consider the structure as a single factor. Under these conditions, the factor loads of the items included in the scale were as follows:

Table 4

Factor Loads of the Scale Items

Items	Load	**Items**	Load
Item01	-.68*	Item12	.63
Item02	-.69*	Item14	.75
Item05	-.64*	Item15	.53
Item06	-.75*	Item16	.68
Item07	.71	Item17	-.65*
Item08	.65	Item18	.67
Item09	.80	Item19	.73
Item10	.83	Item20	-.78*
Item11	.80	Item21	-.77*

As seen in Table 4, all the items had a value higher than .50 in the factor they are included in, and their load values were calculated to be between .53 and .83. On the other hand, seven of these items (items 1,2,5,6,17,20 and 21) function as reverse items. During scoring, these items should be scored in reverse. These items were scored in reverse in other analysis.

The construct validity of the scale, whose exploratory nature was revealed via EFA, was also tested through Confirmatory Factor Analysis (CFA). Confirmatory factor analysis, tests the accuracy of the proposed scale (Tabachnick & Fidell, 2007). Before starting CFA, the structure is tested for multivariate normality. When the multivariate critical ratio is <10.00 in the multivariate normality test for CFA, the structure can be considered to have multivariate normality without taking other values into account (Kline; 2005, Mardia, 1974:118). In that context, results of the normality test performed on the scale are given below.

Table 5

Draft Scale Multivariate Normality Test

Variable	Min	Max	Skew	Critical Ratio	Kurtosis	Critical Ratio
Item01	1	5	.11	1.24	-.56	-3.30
Item02	1	5	.00	0.05	-.85	-4.99
Item05	1	5	-.69	-8.01	-.54	-3.13
Item06	1	5	-.23	-2.74	-.61	-3.56
Item07	1	5	.10	1.22	-.66	-3.83
Item08	1	5	-.23	-2.69	-.97	-5.67
Item09	1	5	-.15	-1.77	-1.05	-6.11
Item10	1	5	-.87	-10.17	-.20	-1.18
Item11	1	5	-.09	-1.09	-1.11	-6.50
Item12	1	5	-.29	-3.38	-.88	-5.17
Item14	1	5	-.39	-4.53	-.85	-4.98
Item15	1	5	-.25	-2.94	-1.11	-6.51
Item16	1	5	-.79	-9.23	-.27	-1.58
Item17	1	5	-.73	-8.50	-.56	-3.26
Item18	1	5	.20	2.36	-.96	-5.60
Item19	1	5	-.46	-5.43	-.93	-5.41
Item20	1	5	-.53	-6.21	-.71	-4.17
Item21	1	5	-.24	-2.82	-.92	-5.35
Multivariate					12.00	**6.40**

As seen in Table 5, the scale meets the multivariate normality criteria as the multivariate normality critical ratio of the 18 items is 6.40. Since the research data indicates multivariate normality, Maximum Likelihood method was preferred as it is the most preferred method when multivariate normality is ensured (Golob, 2003; Schumacher & Lomax, 2004). Firstly, goodness of fit indicators were examined for the fit of the model.

Table 6

*Model-1 Goodness of Fit Indicators**

Indicator	Good Fit	Perfect Fit	Model Tested
$\chi 2$	-	-	1442.44
p value	-	-	.000
df	-	-	135
$\chi 2/df$	$0 \leq \chi 2/df \leq 3.00$	$3 \leq \chi 2/df \leq 5.00$	1.69
RMSEA	0≤RMSEA≤.05	.05≤RMSEA≤.08	.11
SRMR	0≤ SRMR ≤.05	.05≤ SRMR ≤.08	.09
NFI	.95≤NFI≤1.00	.90≤NFI≤.95	.84
CFI	.95≤CFI≤1.00	.90≤CFI≤.95	.85
GFI	.95≤GFI≤1.00	.90≤GFI≤.95	.80
AGFI	.90≤AGFI≤1.00	.85≤AGFI≤.90	.75

***Sources of reference ranges:** Jöreskog, 2004; et al., Çokluk et al., 2012; Jöreskog & Sörbom, 2001; Tabachnick & Fidell, 2007; Kline, 2011; Schumacher & Lomax, 2010.

As seen in Table 6, some of the indicators ($\chi^2/df=10.69 >5.00$; RMSEA=.11; SRMR=.09; NFI=.84;CFI=.85; GFI=.80; AGFI=.75) do not have the values to fall within the required reference range for the fit of the model. Therefore, in order to improve the fit of the model, the following modification indices suggested by the AMOS program were applied to the model and the model was retested.

Table 7

Covariances

Covariance			M.I.	Par Change
e17	<-->	e18	145.47	.34
e1	<-->	e2	135.27	.27
e14	<-->	e15	120.97	.26
e7	<-->	e13	106.51	.42
e10	<-->	e15	49.98	-.17
e10	<-->	e12	46.70	.17
e4	<-->	e10	40.17	.18
e10	<-->	e13	38.74	.19
e13	<-->	e15	36.01	-.17
e7	<-->	e10	34.55	.20
e4	<-->	e15	34.48	-.16
e15	<-->	e18	34.22	.14
e5	<-->	e9	32.12	-.19
e15	<-->	e16	31.99	.15
e2	<-->	e12	31.12	-.13
e15	<-->	e17	26.98	.13
e7	<-->	e15	25.78	-.16
e16	<-->	e17	25.41	.16
e8	<-->	e12	24.89	.13
e1	<-->	e12	24.34	-.12
e5	<-->	e18	24.01	.15
e9	<-->	e10	23.97	.14
e2	<-->	e5	23.18	.13
e12	<-->	e13	23.15	.14
e1	<-->	e13	22.30	-.14
e11	<-->	e18	22.19	-.10
e5	<-->	e8	22.10	-.14
e10	<-->	e16	22.04	-.14
e6	<-->	e17	21.44	-.14
e13	<-->	e17	20.91	-.15
e3	<-->	e4	20.32	.15
e12	<-->	e18	19.83	-.11
e2	<-->	e13	18.94	-.12
e2	<-->	e10	17.75	-.10
e3	<-->	e14	17.08	-.12
e8	<-->	e9	16.93	.12
e10	<-->	e17	16.22	-.11
e11	<-->	e17	15.85	-.09
e13	<-->	e16	15.70	-.14
e2	<-->	e15	15.36	.09
e5	<-->	e12	15.20	-.11
e4	<-->	e5	14.97	-.13
e8	<-->	e13	14.73	-.12
e6	<-->	e11	14.63	.09
e1	<-->	e10	14.53	-.09
e4	<-->	e13	14.28	.13
e5	<-->	e16	14.20	.13

Covariances were drawn between the error scores of the scale items by applying the modification indices. It is an acceptable practice to have inter-item covariances within a scale. Inter-item covariances were considered normal in the scale, which was tested as a single-factor model and parameters of which are given below.

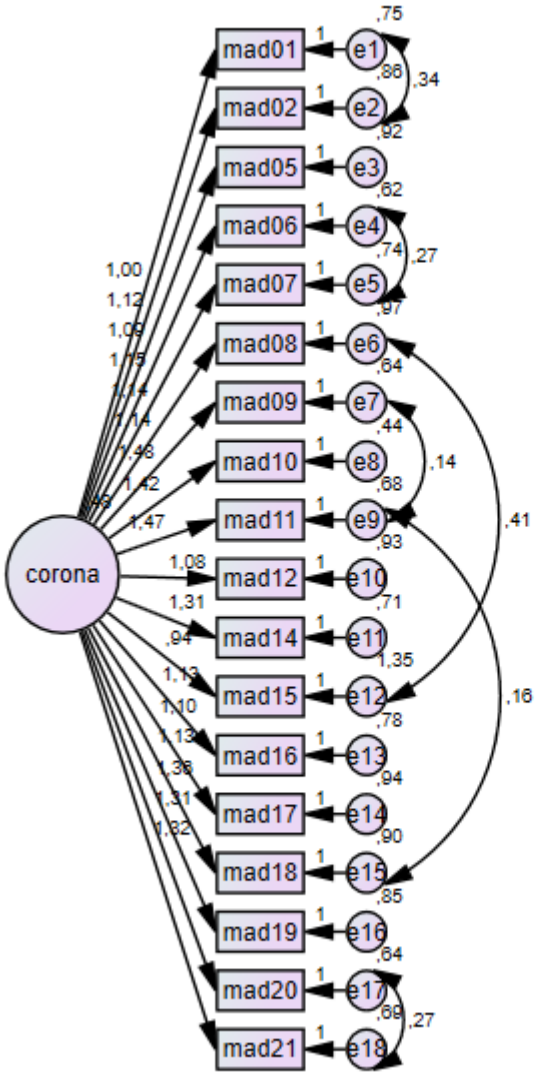

Figure 2. Diagram for the Item Covariances

Table 8

*Model-2 Goodness of Fit Indicators**

Indicator	Good Fit	Perfect Fit	Model Tested
$\chi 2$	-	-	318.31
p value	-	-	.000
df	-	-	88
$\chi 2/df$	$0 \leq \chi 2/df \leq 3.00$	$3 \leq \chi 2/df \leq 5.00$	3.62
RMSEA	0≤RMSEA≤.05	.05≤RMSEA≤.08	.06
SRMR	0≤ SRMR ≤.05	.05≤ SRMR ≤.08	.05
NFI	.95≤NFI≤1.00	.90≤NFI≤.95	.96
CFI	.95≤CFI≤1.00	.90≤CFI≤.95	.97
GFI	.95≤GFI≤1.00	.90≤GFI≤.95	.96
AGFI	.90≤AGFI≤1.00	.85≤AGFI≤.90	.92

***Sources of reference ranges:** Jöreskog, 2004; Çokluk et al., 2012; Jöreskog & Sörbom, 2001; Tabachnick & Fidell, 2007; Kline, 2011; Schumacher & Lomax, 2010.

As seen in Table 8, values of the $\chi 2/df=3.62$; RMSEA=.06; SRMR=.05; NFI=.96; CFI=.97; GFI=.96; AGFI=.9 goodness of fit indicators makes the model a perfect fit. Since the goodness of fit of the model is based on these values, the standardized variance values of the model is given below.

Table 9

Draft Scale Standardized Regression Table

Regression Weights			Crude Prediction Coeffcicient	sh	Critical Ratio	p	Std. Prediction Coefficient
Item21	<---	Corona	1.00	-	-	-	.76
Item20	<---	Corona	.98	.03	28.58	***	.76
Item19	<---	Corona	1.00	.05	20.94	***	.71
Item18	<---	Corona	.82	.05	18.18	***	.63
Item17	<---	Corona	.82	.05	17.99	***	.62
Item16	<---	Corona	.82	.04	18.95	***	.65
Item15	<---	Corona	.68	.05	13.63	***	.48
Item14	<---	Corona	.96	.05	21.38	***	.73
Item12	<---	Corona	.78	.05	17.39	***	.60
Item11	<---	Corona	1.09	.05	22.51	***	.79
Item10	<---	Corona	1.05	.04	25.01	***	.83
Item09	<---	Corona	1.10	.05	21.97	***	.79
Item08	<---	Corona	.86	.05	17.22	***	.65
Item07	<---	Corona	.84	.04	19.90	***	.68
Item06	<---	Corona	.85	.04	20.82	***	.71
Item05	<---	Corona	.79	.05	17.54	***	.61
Item02	<---	Corona	.84	.04	18.95	***	.66
Item01	<---	Corona	.74	.04	18.18	***	.63

Factor loads of the items should ideally be .70 or above, and at least .50 (Hair et al. 2009). As seen in Table 9, all of the standardized variances are significant at the p<.001level and the lowest is at the acceptable level of .62.

Pearson product moment correlation analysis was performed in order to calculate the significance of the relationship between the scale items and the total scores of the scale (item total) (). It was revealed that all the

correlation values, which were calculated as the highest and the lowest, were significant (p<.001), and all items measured the same structure.

For item discrimination, the significance of the difference of means between the lower () and the upper () groups was tested with the independent groups t-test. At the end of the analysis, the differences between the arithmetic means for all items and scale total scores were found to be significant (p<.001). These differences were in favor of the upper group. The results in question reveal that the total score of the items and the scale is distinctive.

After the statistical validation of the single-factor structure of the 18-item scale at the end of EFA and CFA, lastly the reliability of the 18-item structure of the scale was tested. The results of the reliability analysis showed that the internal consistency indicator (Cronbach's alpha) was α=.94; Guttman's reliability coefficient .97, and Spearman-Brown coefficient .97, split-half reliability coefficient r_{1-2}=.94 and, test-retest coefficient was r=.87. These values indicate that the scale has a high level of internal consistency. Since no item that had a reductive effect on the reliability of the scale was detected at the end of the reliability test, no item was eliminated.

In conclusion, the 18-item scale has KMO=.95 sample adequacy and explains 50,37% of the total variance with a total factor load of 9.07 in 1 factor. EFA results of the scale shows that among the goodness of fit indicators, χ^2/df=3.62<5.00; RMSEA=.06; SRMR=.05; NFI=.96; CFI=.97; GFI=.96; AGFI=.92, have perfect fit with their corresponding values. According to the results of the reliability analysis performed to test the reliability of the scale, it was found to be reliable with the internal consistency α=.94; Guttman's reliability coefficient .94, and Spearman-Brown coefficient .94. Scale scoring is calculated by dividing the total score calculated after reversing the reversed items by the number of items. In that context, the lowest score that can be obtained from the scale is 1,00, and the highest is 5.00.

While an increase in the scale score signifies an increase in the negative perception and expectations regarding the ability to successfully adapt to the post-pandemic life as easily as the pre-pandemic life; a decrease in the scale score signifies a decrease in the negative perception and expectations regarding the ability to successfully adapt to the post-pandemic life as easily as the pre-pandemic life.

Table 10

Descriptive Values for PCAS Scores

Score	N	Min	Max	x−	ss	Skew	Kurtosis
PCAS Score	1021	1.00	5.00	3.28	.84	-.40	-.24

As seen in Table 10, the arithmetic mean of the PCAS scores of the individuals that form the sample group is calculated as the standard deviation. These values indicate that the expectation levels of individuals regarding post-Covid-19 adaptation are indecisive, although slightly inclined towards positive. On the other hand, there are different

references to the limits of skewness and kurtosis. According to Bayram (2013), Büyüköztürk (2020) and Çokluk et al. (2012), the distribution is assumed normal if it is between skewness and kurtosis. The skewness (-.40) and kurtosis (-.20) values in the table indicate the distribution is quite similar to the normal distribution. On the other hand, Çil (2008) suggests that from the perspective of the central limit theorem, a sample size of approximately 30 people is considered sufficient to deem a distribution normal, whereas Armutlulu (2008) suggests that no matter however the shape of the variable in the population is distributed in practice, if the sample size is n≥30, the shape of the distribution can be considered close to the normal distribution. The distribution can also be considered similar to the normal distribution when the size is =1021. In that context, parametric techniques were utilized in comparative analyses.

Table 11

Comparison of PCAS Scores for Gender Variable

Score	**Groups**	N	x−	ss	shx−	T Test			Cohen d
						t	sd	p	
PCAS Scores	Female	881	3.34	.82	.03		1019	.000	.468
	Male	140	2.93	.83	.07				

As seen in Table 11, t-test was performed in order to determine the significance of the difference between the gender groups. Levene analysis shows that the variances are homogenous (=.81; =.368). At the end of the analysis, the difference between the arithmetic means of the groups was found to be significant ($t_{(1019)}$=*5.48; p=.000*). IT was found that women's expectations for adaptation after Covid-19 were significantly more positive than men's. On the other hand, Cohen's D was calculated in order to measure the effect size of gender on PCAS scores. The value obtained (η2 ≅. 02) indicates that it has an effect size closer to medium.

As seen in Table 12, one-way ANOVA was performed to determine the significance of the difference between the age groups in terms of PCAS scores. Variances of the data are homogenous (*=1.15; =.334).* The difference between the arithmetic means of the groups was found to be significant ($F_{(4;1016)}$*=6.36;* p=*.000*). According to the Scheffe analysis that was performed, post-Covid-19 expectation levels of the 50 and over age group were significantly more positive than both the 20 and under and 21-29 age groups. In addition, eta squared value (η^2) was calculated to determine the effect size of age groups on PCAS scores. The value obtained (η^2 ≅. 02) indicates a small effect size.

Table 12

Comparison of PCAS Scores for Age Variable

f, $\bar{x}$ ve ss Values					ANOVA, Scheffe and Results							
Score	**Group**	N	$\bar{x}$	ss	**Var. K.**	KT	Sd	KO	F	p	**Scheffe**	$\eta 2$
PCAS Scores	20 and below (1)	142	3.12	.84	**Intergroup**	17.45	4	4.36	6.36	.00	1<5 2<5	.024
	21-29 (2)	449	3.21	.81	**Ingroup**	695.95	1016	.69				
	30-39 (3)	213	3.33	.86	**Total**	713.40	1020					
	40-49 (4)	133	3.43	.84								
	50 and above (5)	84	3.60	.78								
	Total	1021	3.28	.84								

As seen in Table 13, one-way ANOVA was performed to determine the significance of the difference between groups of educational status in terms of PCAS scores. Variances of the groups are homogenous (=1.35; p=.243). The difference between the arithmetic means of the groups was not found to be significant ($F_{(5;1015)}=1.58;\ p=.163$). On the other hand, eta square value (η^2) was calculated to determine the effect size of educational status on PCAS scores. The value obtained ($\eta 2 \cong .01$) indicates a small effect size.

Table 13

Comparison of PCAS Scores for Educational Status Variable

f, $\bar{x}$ ve ss Values					ANOVA, Scheffe and $\eta 2$ Results							
Score	**Group**	N	$\bar{x}$	ss	**Var. K.**	KT	Sd	KO	F	p	**Scheffe**	$\eta 2$
PCAS Scores	High school Std (1)	58	3.13	.97	**Intergroup**	5.51	5	1.10	1.58	.163	-	.01
	Undergraduate Std (2)	306	3.25	.78	**Ingroup**	707.89	1015	.70				
	Postgraduate Std (3)	49	3.10	.87	**Total**	713.40	1020					
	High School Graduate (4)	82	3.40	.88								
	Undergraduate Std (5)	374	3.34	.83								
	Postgraduate. (6)	152	3.27	.86								
	Total	1021	3.28	.84								

As seen in Table 14, one-way ANOVA was performed to determine the significance of the difference between groups of perceived income level. Variances of the data are homogenous *(=.80; p=.496*). The difference between the arithmetic means of the groups was not found to be significant ($F_{(3;1017)}$*=.59; p=.163*). On the other hand, eta square value (η^2) was calculated to determine the effect size of perceived income level on PCAS scores. The value obtained ($\eta 2 \cong .001$) indicates a negligible effect size.

Table 14

Comparison of PCAS Scores for Perceived Income Level Variable

f, $\bar{x}$ ve ss Values					ANOVA, Scheffe and $\eta 2$ Results							
Score	**Group**	N	$\bar{x}$	ss	**Var. K.**	KT	Sd	KO	F	p	**Scheffe**	$\eta 2\eta 2$
PCAS Scores	Below Middle (1)	157	3.22	.83	**Intergroup**	1.24	3	.41	.59	.622	-	.001
	Middle (2)	636	3.31	.82	**Ingroup**	712.16	1017	.70				
	Above Middle (3)	194	3.27	.89	**Total**	713.40	1020					
	High (4)	34	3.21	.88								
	Total	1021	3.28	.84								

Levene: ,797 (p=.496)

As seen in table 15, t-test was performed to determine the significance of the difference between groups of work status during pandemic in terms of PCAS scores. Levene analysis indicates that the variances are homogenous (L_F*=2.88; p=.090*). According to the analysis results, no significant difference was found between the arithmetic means of the groups ($t_{(1019)}$*=-1.79; p=.074*). On the other hand, Cohen's D was calculated to determine the effect size of work status during pandemic on PCAS scores. The value obtained ($d \cong .16$) indicates a small effect size.

Table 15

Comparison of PCAS Scores for Work Status During Pandemic Variable

Score	**Groups**	N	*x-*	*ss*	*shx-*	T-Test			Cohen d
						t	*sd*	*p*	
PCAS Scores	I worked outside	126	3.16	.90	.08	-1.79	1019	.074	.162
	I was home	895	3.30	.83	.03				

Findings

According to the research results, during the scale development process, which started with an item pool of 30 items, 8 items were eliminated after the Lawhe analysis and 4 items were eliminated after the EFA, and the scale was completed with 18 items. The items obtained minimum .53 and maximum .83 load value from the factor. It is suggested a item load value of .30 or higher indicates a good discrimination index, whereas .45 or higher indicates that it will be a far better criterion for selection (Büyüköztürk, 2020). Seven items in total in the scale (items 1, 2, 5, 6, 17, 20 and 21) are reversed items. Tavşancıl (2019) states that care should be taken to include negative statements (reverse items) as well as positive ones in a scale.

The scale in its final version displays a single-factor structure, and this single factor explains approximately 50,37% of the total variance with a 9.07 eigenvalue. Yaşlıoğlu (2017) suggests that the explained variance value exceeding 50% of the total variance is an important criterion in factor analysis. The scale meets the requirements stated in the literature both in terms of item loads and the explained total variance. In the construct validity of the scale, which was also tested via the CFA, acceptable fit indices were reached after modifications suggested by the AMOS program. These values were found as $\chi 2/df=3,62$; RMSEA=.06; SRMR=.05; NFI=.96; CFI=.97; GFI=.96; AGFI=.92, and the values in question indicates that the model is a perfect fit (Çokluk et al., 2012; Jörekog, 2004; Jöreskog & Sörbom, 2001; Tabachnick & Fidell, 2007; 2011; Schumacker & Lomax, 2010).

While the factor loads obtained from the DFA analyses were expected to be a minimum of .50 (Hair et al. 2009), total of the variances standardized a result of the analyes were found to be significant at the level of <.001 and the lowest load was found to be .62.

Alternative techniques were also utilized for the reliability processes of the scale. Alpha (Cronbach's Alpha) coefficient calculated as an internal consistency indicator was found to be α=.94; Guttman's reliability coefficient obtained from the split-half technique =.97; Spearman Brown coefficient SB=.97 and split half reliability =.94; and finally test-retest reliability was found to be =.87.

Özdamar (1999), Tavşancıl (2019) and Alpar (2020) suggests that reliability values over .80 indicates a high level of reliability. In that context, the values obtained suggests that the scale has a high level of reliability. In addition, item total correlations and item discrimination analyses were also performed in the context of reliability.

According to Büyüköztürk (2020), when the correlation between each item and the total score obtained from the sub-scale it belongs to is above .30, the items are considered to be compatible with each other. On the other hand, that results of the t-test, which is applied to measure the discrimination tested between the top and bottom 27% slices after the data are sorted, show a significant difference between the means is an evidence of the internal consistency of the scale. Total item correlations obtained in the research ranges from .53-.75 and reveals that all items have a high level of correlation (p<.001) with the scale. On the other hand, in discriminant analyses of all items, the means of the group in the top 27% slice were also significantly higher. These results reveal that the scale is discriminative for individuals in different levels in terms of the measured trait. The scoring of the scale is done by dividing the total number of points obtained from the responses to 18 items by the number of items. While an increase in the scale score signifies *an increase in the negative perception and expectations regarding the ability to successfully adapt to the post-pandemic life as easily as the pre-pandemic life;* a decrease in the scale score signifies *a decrease in the negative perception and expectations regarding the ability to successfully adapt to the post-pandemic life as easily as the pre-pandemic life.*

Discussion

This study was conducted just before the normalization process after Covid-19 started; while lockdown was still in effect. Studies from all over the world suggest that social isolation negatively impacts human psychology (Qiu et al., 2020). General conclusion reached at the end of this study is that expectation levels of individuals regarding adaptation after Covid-19 period are indecisive, although display a slight incline towards positivity.

When the results are examined in terms of age, it is seen that the expectation levels of 50 and above are significantly more positive compared to other age groups. However, no significant difference was observed in terms of educational status, income level, staying home and working during the pandemic.

Another finding of the study is that expectation levels of women are significantly higher compared to men. This may be due to the fact that the number of female participants were higher than that of male participants, and it should be tested in another sample group. No significant difference was obtained in terms of other demographic data in the study. However, there are studies that have investigated the effects of factors such as low-income level, staying with family during the pandemic, being unemployed during the pandemic etc. (Duan & Zhu, 2020). Testing the study with different groups in terms of different factors such as being a health-care worker or having caught the disease will impact the results. A one-dimensional, valid and reliable inventory consisting of 18 items aimed at measuring expectations of individuals regarding adaptation after Covid-19 was also obtained within the scope of this study. It is our hope that both the results and the scale obtained as a result of this study will contribute to the lacking data literature in our country and provide data for international comparisons. The research in question was carried out before the post-Covid-19 normalization process began. Results of repeated measurement in time may provide valuable data in terms of determining how much and how fast the individuals respond to the post-pandemic period.

Studies conducted all over the world during the pandemic report that individuals that have been subjected to the pandemic and especially social isolation display symptoms such as panic disorder, anxiety and depression (Ho et al., 2020; Qiu et al., 2020). Post-Covid-19 adaptation processes of individuals can be tracked through a study such as this one, thus determining the expectations of individuals for change and adaptation. Such an effort is thought to be valuable in tracking the possible responses the individuals may have regarding adaptation in future pandemics and developing appropriate policies.

The study contains data that were obtained through a sample group dominated by female participants. It is important that the data obtained amidst the limitations caused by the pandemic and the lockdown should be tested with different groups and the results should be discussed. The participant themselves had not caught Covid-19 at the time. Post-pandemic adaptation levels of individuals who have caught the disease should be investigated separately.

Revealing differences regarding expectations about post-Covid-19 adaptation via repeated measurements in time will make great contributions to the literature. Data that were obtained while the normalization process was about the begin and the lockdown was still in effect provide a valuable opportunity for comparison in that regard. Also, it is possible for experts that work on psychological support during the pandemic to benefit from the findings of this study in the programs they will prepare.

Sample Items

1. I think that I will be able to freely go outside once the days of Covid-19 are over.

8. I think that I will feel uneasy in crowded settings after Covid-19.

11. I think that I will keep maintaining the social distance even when I have guests over after Covid-19

18.Boarding a plane/getting on a long-distance bus will not be a problem for me.

Ethic

All procedures in this study involving human participants were carried out in accordance with the ethical standards.

Author Contributions

This article was written with the joint contributions of two authors.

Conflict of Interest

The authors declare that they have no conflict of interest.

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