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A MEASUREMENT TOOL FOR SOCİAL RELATİONSHİPS IN THE SHADOW OF COVİD-19

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ABSTRACT

In the world, after many epidemics have been formed, social changes. The recent Covid-19 outbreak will cause certain changes in social relationships, as well as in all areas. Measuring these changes is very important in predicting the social life effects of the new normal after the epidemic. In this context, our study aims to develop a new measurement tool that will obtain how social relations, which are expected to change after the epidemic, will be and on which criteria will be lived. In this study, after the item pool by sociologists, (the pilot-scale) was created, respectively the draft scale, and the final scale was obtained, by applying item analysis, factor analysis, and other statistical analysis methods used in item selection. Applying the final scale to a new sample (n=438) and then validating through confirmatory factor analysis, the new measurement tool, which measured social relations after the epidemic, was tested. Finally, from the newest data, a high internal consistency coefficient value (0.95), a high explained variance value (73.12%), high-value goodness-of-fit criteria values were obtained. These criteria also show the scale is a valid and reliable tool for measuring post-epidemic social relationships, too. In the measurement tool prepared in 5-point Likert type, 17 social relationships expressions are gathered in 3 sub-dimensions as "social environment," "public space," and "social distance."

Keywords: Covid-19; social relationships; social environment; public space; social life; social distance

COVİD-19 GÖLGESİNDE SOSYAL İLİŞKİLER İÇİN BİR ÖLÇÜM ARACI

ÖZ

Dünyada birçok salgın hastalık oluştuktan sonra toplumsal değişimler meydana gelir. Son dönemde yaşanan Covid-19 salgını, her alanda olduğu gibi sosyal ilişkilerde de belirli değişikliklere neden olacaktır. Bu değişimlerin ölçülmesi, salgın sonrası yeni normalin sosyal hayata etkilerinin tahmin edilmesinde oldukça önemlidir. Bu bağlamda çalışmamız, salgın sonrasında değişmesi beklenen toplumsal ilişkilerin nasıl olacağını ve hangi kriterlere göre yaşanacağını ortaya çıkaracak yeni bir ölçüm aracı geliştirmeyi amaçlamaktadır. Bu çalışmada, sosyologlar tarafından madde havuzu oluşturulduktan sonra sırasıyla taslak ölçek (pilot ölçek) oluşturulmuş ve madde analizi, faktör analizi ve madde seçiminde kullanılan diğer istatistiksel analiz yöntemleri uygulanarak nihai ölçeğe ulaşılmıştır. Nihai ölçeğin yeni bir örneğe (n=438) uygulanması ve ardından doğrulayıcı faktör analizi ile doğrulaması yapılarak, salgın sonrası sosyal ilişkileri ölçen yeni ölçme aracı test edilmiştir. Son olarak en yeni verilerden yüksek iç tutarlılık katsayı değeri (0,95), yüksek açıklanan varyans değeri (%73,12), yüksek değerli uyum iyiliği ölçüt değerleri elde edilmiştir. Bu kriterler aynı zamanda ölçeğin salgın sonrası sosyal ilişkileri ölçmek için de geçerli ve güvenilir bir araç olduğunu göstermektedir. 5'li Likert tipinde hazırlanan ölçme aracında 17 sosyal ilişki ifadesi "sosyal çevre", "kamusal alan" ve "sosyal mesafe" olmak üzere 3 alt boyutta toplanmıştır.

Anahtar Kelimeler: Covid-19, Sosyal İlişkiler, Sosyal Çevre, Kamusal Alan, Sosyal Yaşam, Sosyal Mesafe

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Introduction

Our old world has faced many epidemics throughout history and witnessed many changes during the epidemics. These changes were also seen in social relationships as in every field. The outbreaks were perceived as an emergency. Their lifestyles also necessarily changed accordingly. Today's epidemic is also a reason for the change in many behaviors and lifestyles in our lives. The need to measure these changes in all areas of our lives is increasing day by day.

The aim of this study is to develop a Likert-type measurement tool that will be used to measure the continuation or change of behavior patterns developed during the epidemic in the post-epidemic environment. First of all, an item pool of 50 items including behavior patterns in all post-epidemic areas was examined by linguists and made suitable for grammar and spelling rules (Appendix A1). Then the 50-item Likert type pilot scale was applied to 77 individuals. Many statistical methods used for item analysis such as item discrimination index, two independent groups t-test, simple linear regression, item-remainder correlation were applied to the data set obtained and it was decided to exclude 17 items from the scale. In the third step, the 33-teim Likert-type draft scale was applied to 216 individuals and factor analysis was applied to the data set obtained. As a result of the factor analysis, it was decided to exclude 16 items from the scale and as a result of dimension reduction for the remaining 17 items, the data structure was explained with 3 factors. In the fourth step, the finalized 17-item Likert type scale was applied to a total of 438 individuals, 177 women and 261 men. The results of the factor analysis performed with the data set obtained by applying the finalized scale are the same as the results obtained from the draft scale in terms of factors, variance explanation, coefficients and sampling adequacy criteria. As a result of the factor analysis applied, the final scale consisting of 17 items was found to be grouped in three factors. These three factors contain 73,12% of the variance information included in 17 items. In other words, 73,12% of the information contained in the items in the data set was preserved. The remaining 26,88% part is quite good for unexplained change in factor analysis. Following this, the three factors obtained for factor analysis were named and "Post-epidemic social relationships scale" was finalized. In addition, the Cronbach Alpha reliability coefficient of the final scale is 0.947 and the internal consistency of the scale is perfect.

As a result, the Post-epidemic social relationships scale, as a whole and with its three factors, can be used as a measurement tool to measure the behavior patterns that will be adopted and developed after the epidemic.

Epidemic

If patients with an infectious disease are seen in a certain number in a country or a region each year, this situation is called "endemic", and if the incidence of these cases suddenly increases conspicuously after being observed in close numbers over the years, it is called "epidemic". If the epidemic goes beyond the borders of a country and spreads to other countries and continents, this situation is called "pandemic" (Öztek, 2000: 6). It is difficult to control pandemics with individual measures because pandemic is a social event and it is above a person's capacity to cope (Kayı, 2020: 106). Epidemics are events that people cause and control through their behaviors

(Artvinli, 2020: 52). However, although epidemic processes are controlled in time, they change and transform the political, economic and social structures of societies. In other words, disasters such as epidemics bring along social change processes because epidemics affect the cultural life of societies, beyond being a mere health problem. With the effect of epidemic processes, new norms are formed and social relationships are reconstructed accordingly.

Epidemics, by their nature, contain many risks and uncertainties. In order to be able to sociologically interpret the processes that affect human behavior in epidemics, some key concepts are used such as risk (Lupton, 2016a), fear (Furedi, 2017), stigmatization (Goffman, 2020), panic (Falkof, 2020), crisis (Habermas, 1975), and trust (Luhmann, 1979). When considered in the context of social relationships, trust stands out among these key concepts.

When considered within the context of social relationships, trust stands out among these key concepts (Ward, 2020: 3). In the face of a situation that threatens the whole society, such as an epidemic, people look for anchors they can feel safe. In addition to all these, considering today's conditions, the probability of epidemics to occur and the rate of spread of epidemics are increasing gradually. The universalization of threats to health threatens existence everywhere and every time (Beck, 2019: 127). Technological developments and globalization increase social mobility and thus pave the way for epidemics to spread easily to different geographies.

Throughout history, the solutions human beings have produced for the problems faced have become a part of cultural life over time. Humans are beings that look for ways to overcome problems in the face of social issues and difficulties (Uysal, 2020: 285). Humans rearrange their social relationships against the measures taken during the epidemic process, the prolongation of the epidemic process and the possibility of reappearance of epidemic diseases. It is predicted that a significant part of protective measures which are suggested to protect against epidemic diseases such as controlled social life, mask, social distance and cleaning will continue after the epidemic. When all these processes are taken into consideration, social relationships are evaluated within the context of trust and this situation is handled within the framework of social distance rules. Social relationships which are determined based on social distance determine the direction of the relationships of individuals with their social environment and how they can meet their needs within social life.

Epidemics are health events that cause life changes in world history and that have global effects (Karakaş, 2020: 557). It is inevitable for individuals to be affected by political, economic and social events and changes that occur due to epidemic. Ideas, beliefs, values, habits and behaviors develop due to both good and bad experiences; in this sense, epidemics leave deep effects on all of these. Epidemics can change the way individuals see the world, their way of thinking and leading their lives. Regardless of the human tragedy of lost lives, dissolving families and wounded communities, economic and social changes caused by a pandemic focused quarantine will create a long-lived cultural heritage in the memories of individuals and future generations. Short-term effect of epidemics is felt due to globally common quarantine and social distance measures. Even if epidemics end, they have long term and deep economic,

social, political and cultural effects (Çakıroğlu, Pirtini & Çengel, 2020: 88). Epidemics will cause some changes in individuals' lives, social life and social state and health policies. After the epidemic, there will be some changes in individual lives, social life and social state and health policies. The changes that occur due to epidemic also affect the post-epidemic social relationships.

The Effects of Epidemics On Social Relationships

Humans are social beings. Socialization process continues as long as human beings live. Socialization is social interaction processes. However, social relationships are reconstructed in social interaction processes in the face of changing conditions because epidemic processes are social events and therefore epidemics should be evaluated not individually, but collectively.

A society in fear condemns any behavior that it deems risky, even if it cannot eliminate risk itself (Furedi, 2017). During the epidemic, a large number of variables such as getting infected with the epidemic, having someone close being infected with the epidemic, losing someone close due to epidemic, the length of the epidemic, difficulties in taking the epidemic under control, the possibility of reoccurrence of epidemic affect post-epidemic social relationships. The measures put forward due to the epidemic continue to a great extent after the epidemic. Although practices vary from culture to culture, the rules regarding social distance continue to a certain extent in the individual's social environment and public spaces. Public spaces are areas where people gather outside the home (Dacheux, 2012). In other words, they are possible meeting areas outside the home for people who know or don't know each other. Areas such as public transportation vehicles, shopping malls, parks and public buildings are public spaces. Epidemics affect the social interaction processes of people who are likely to encounter in public spaces.

Class structures get stronger in times of high risk such as epidemic. However, a social boomerang effect occurs while risks are spreading (Beck, 2019: 50). This is because there is always a risk for diseases to spread (Giddens, 2012: 92). In neighbourhoods where working people live, the fact that young people or working population come together, go to supermarkets, meet to socialize and eventually have to work increases the risk of transmission of the disease and causes the epidemic to spread. These processes highlight the social class structures in urban life even more. The design of densely populated cities show how important they are in terms of health (Ergönül, 2020: 92). It is seen that the people least affected of the epidemic process are those living in the countryside. In this sense, epidemics occur and spread in cities. In cities where social interaction processes are intense, people lead a controlled life due to epidemic. In city life, social relationships are rearranged according to social distance rules. After epidemic, social relationships are considered in the context of social environment and public space within the framework of social distance rules.

When epidemics and social relationships are considered together, the social environment formed by the socialization process stands out. Social environment of the individual is shaped from close to far, depending on trust. In daily life, the individual comes together with or meets people such as spouses, relatives, friends, neighbours, colleagues, teammates in places such as a hairdresser, care centre, etc. visited

regularly. When the history of epidemics is examined, it can be seen that social environment has more effect on people's facing the epidemic process. In epidemic disease processes, the risk of disease transmission depends on the relationship between social environment and social distance. In a controlled social life, humans can protect themselves from people they don't know. However, the risk environment that transmits the epidemic is usually caused by the closest social environment. The concern of carrying the risk of epidemic disease in the social environment also increases social insecurity (Süleymanlı, 2020). The possibility of being infected by people from the social environment can cause individuals to experience stress and panic by strengthening the feeling of insecurity in them. Therefore, this situation may endanger the spirit of solidarity in society and cause people to adopt an exclusionary attitude to each other.

Epidemics threaten not only health, but also life style altogether (Yıldırım & Akgül, 2020: 148). When today's city life is considered, humans have to be in social life to meet their social and basic needs. In other words, human beings have to meet all their basic needs even if they cannot get out of the house so that they can lead their lives (Yaman, 2020: 298). People are dependent on each other due to the organic relationships that occur with the process of urbanization. Most of the time, individuals have to go to the bakery or the supermarket for the basic needs of the house, for example, to buy bread in the simplest term. How social life should be during epidemic processes is determined within the framework of epidemic rules. Social distance also comes to the forefront in epidemic processes. This approach will also be reflected in social life areas after the epidemic because humans are beings with needs. They have to use public transportation for long distance travels. If they have problems with their private vehicles, they have to take them for repair. Therefore, when it is considered that a significant part of the society lives in cities, individuals interact with the people they don't know most of the time and they have to get in crowded environments.

Life wants a radical transformation where we will reconstruct our socialization, work and consumption habits (Varlık, 2020: 36). However, it is not possible to bring cities to life by demolishing and rebuilding them (Baudrillard, 2020: 104). It can be seen that the threats caused by epidemics will continue as long as human beings don't give up on their mentality and habits that may cause epidemic. Many negativities come to the fore considering how social relations will be shaped and what kind of a social management style will occur in the world after the epidemic. While introversion, control, surveillance, discipline and social distance increase in social life, the possibility of the state becoming more supervising and authoritarian is higher (Keyman, 2020: 232). In social life, with the increase in scepticism in relationships that were regarded as usual due to the problem of transmission of disease, habits will change and suspicion against strangers will increase in societies (Arslan & Karagül, 2020: 25). On the other hand, it is inevitable that it will bring about certain changes in social life, trade, education and social relationships after the epidemic (ESCARU, 2020: 15). When all these are considered together, it should be reviewed how social relationships should be in order to maintain existence healthily in social life. Especially social distance rules are among the most important variables that should be considered in post-epidemic social life.

Social distance, which emerged as a result of the scale developed to measure nationalist and racist attitudes (Bogardus, 1925), is one of the protective measures created based on trust in social relationships during epidemic processes. In order to ensure social distance, some changes are expected in areas such as urban settlements to be comfortable and calm, distribution of population density, creating comfortable and appropriate social spaces for employees and creating healthy living conditions in cities to reduce chronic diseases (Ergönül, 2020: 93).

It is seen that distance is one of the most difficult issues to pay attention to and apply as one of the prominent protection methods during the epidemic process. Distance is a practice that causes weirdness in communications in environments where people know each other. It is easier to keep the distance against strangers; however, there are also some situations when even this is difficult. The first examples that come to mind are public transportation vehicles and supermarkets. On the other hand, we are beings who shake hands, hug and kiss to greet the people we know; besides, there is also a culturally negative meaning of not doing this (Kayı, 2020: 116). This is because how close two people in a society can be is a cultural phenomenon (Şatıroğlu, 2020). Cultural approaches determine how and how much social distance will be in social relationships. Social distances are determined according to closeness of social environment. Accordingly, social distances against people who are seen as strangers will increase even more after the epidemic. People will try to stay away from public spaces unless they have to. In cases where necessary, social relationships in social living spaces will be more controlled and social distance rules will be determinant in this issue.

The epidemic process has also highlighted the phenomenon of digitalization. Due to the epidemic, people do not meet in person if they don't have to and they communicate with audio and video through digital devices. There are buttons such as literature and science. The whole world takes place in one room; all meetings take place in some kind of online environment. Everything comes to people; people do not go to those things (Yaman, 2020: 294). Considering today's developments, it is predicted that many changes will occur in the life of individual and society with digitalization after the epidemic. Today, when epidemic events and the phenomenon of digitalization are evaluated together, it is predicted that there will be obvious changes in norms, attitudes and behaviors after the epidemic and especially the social relationships between people will be influenced by this process.

Materials and Methods

The quantitative data obtained in this study were collected between February 2021 and March 2021 via Google Forms. The number of participants in the pilot, draft and final scales consist of 77, 216 and 438 samples, respectively. Ethics committee permission was taken from OMÜ Social and Human Sciences Ethics Committee with the 29.01.2021 dated and 2021/119 numbered decision in order to carry out the study.

Although two, three, four, six and seven Likert-type categories are used in Likert-type scales, 5-Likert type scale is the most practical and common one. Developed by Rensis Likert in 1932, this type of scale includes a series of items related

to a subject's attitude towards a phenomenon (graded as “strongly agree, agree, neutral, disagree, strongly agree”).

The stages to be followed while developing a Likert-type attitude scale are as follows (Anderson, 1988; Tezbaşaran, 2008):

- An item pool containing positive or negative expressions towards the attitude object to be measured is created. Attitude scales have two types of item structures consisting of positive and negative affirmation sentences. Positive and negative items are formed in approximately equal numbers.
- The item pool created is examined by experts.
- Items which are not considered as appropriate by the experts are excluded.
- The remaining items are listed randomly. The degrees of responses to the items are added. This way, the pilot form of the scale is ready to be applied.
- A suitable sample is chosen from the population to which the scale will be applied and the pilot scale is applied to the chosen sample.
- Item scores are created by scoring the responses given by each subject in the sample to the items. Scale scores of the subjects are calculated by adding the item scores of each sample. Total scale score is found by adding the calculated scale scores.
- The correlation between each item score and total scale score is calculated.
- The items which have statistically insignificant correlation coefficients are excluded from the scale. Thus, internal consistency criterion of the scale is met.

The accuracy of the responses given by the samples to the attitude phenomenon is directly correlated with the reliability and validity of the scale. Reliability is the measurement tool’s power to measure free of error. In other words, it is a measure of the consistency of item scores with scale scores. Validity can be expressed as the power of the scale to measure only the variable to be measured with that scale. For this reason, the validity and reliability of Likert type scale depends on the quality of the items of the related scale. In this sense, in item selection in Likert-type scales, statistical analysis methods such as t-test, item discrimination power index, simple linear regression analysis, item remainder correlation, and confirmatory factor analysis are used. Two groups with the highest and the lowest 27% are formed from the total scores obtained from the scale. The scores of each item are evaluated with the t-test according to the groups formed. The difference between the mean scores is statistically significant items are called important items. This, also means that this item is a part of the measurement tool and should exist on the scale (Büyüköztürk, 2002: 470-483; DeVellis, 2003; Thorndike, 1997).

The discrimination power index is calculated from equally sized high and low scoring groups in the test. The range of this index is +1 to -1. The item with the discrimination power index value of 0.4 and above obtained by using the lower and upper 27% of the sample is a good item; besides this, having less than 0.2 values items are also considered bad items. Items with item discrimination power index between 0.21 and 0.39 are corrected and continue to be included in the scale. Accordingly, items with a discrimination power of 0.20 and above are acceptable items (Brown, 1981; Ebel, 1954: 352-364; Wright, Mead & Bell, 2002).

The item remainder correlation shows the relationship between the total score of the remaining items after the related item is removed from the scale and the related item score removed. In other words, it expresses the contribution of the item to the total score of the scale. Items with negative value and less than 0.20 item residual correlation should be removed from the scale (Thorndike, 1997).

Regression analysis reveals the existence of a linear relationship between dependent variable (total item scores from scale) and independent variable (the item scores). Items with statistically insignificant regression coefficients are excluded from the scale.

Factor Analysis ensures that the sub-dimensional structure of the items is formed with certain criteria. It reveals the different classes that exist within the event to be measured. The determinant of the correlation matrix, the test of whether there is a identity matrix, sample adequacy the variance explained, the change revealed by the factor model, and the high-value factor loads are the criteria taken into consideration in these structures' formation (Büyüköztürk, 2002: 470-483).

After all these statistical analyses are applied to the quantitative data, item analyses are compared with Spearman Rank Differences Correlation for the consistency of all item analysis methods and extracted items. While high correlation coefficient shows high agreement and all item analyses take the same item out of the scale, low correlation coefficient shows weak agreement and that there is no consistency between item analyses in terms of item selection (Tunç, Komitoğlu & Bekiryazıcı, 2014: 15-24).

Results

In this study, the target audience of the research is individuals over the age of 18. The sample size applied in the final scale was determined by the random sampling method to be at least 20 times the number of items (Kline, 2016). Statistical analyzes were performed with SPSS 20 and LISREL 8.7 package programs.

The 50-item pilot scale formed was applied to 92 individuals with the help of Google forms. The responses of the subjects to the items were scored as “strongly agree=5, agree=4, no idea=3, disagree=2, strongly disagree=1”. The responses given by the subjects to items were scored. The forms of the participants who did not respond to at most 5% of scale items and the participants who responded uniformly were considered as null and excluded from the analysis. The responses of the remaining 77 individuals were used as base.

Next, the 33-item draft scale created with item analysis methods was applied to 216 individuals, 16 items were removed from the scale with factor analysis and 17-item Post-epidemic Social Relationships Scale (PESRS) was finalized. The 17-item final scale was uploaded to the system again with the help of Google forms, it was applied to 438 individuals and the distribution of the final scale items to the factors was found. Table 1 shows the descriptive statistics of the total scores of the pilot, draft and final scale.

Table 1: Descriptive Statistical Values of the Scale

Descriptive Statistics	Pilot scale	Draft scale	Final scale
Arithmetic Mean	153.25	80.19	43.99
Median	152	80.00	43
Standard Deviation	22.04	22.85	15.48
Lowest Scale Score	108	34.00	18
Highest Scale Score	219	145.00	88
Skewness (standard error)	0.39(0.27)	0,32(0,17)	0.35(0.15)
Kurtosis	0.22	-0.59	-0.67

The data obtained in Table 1 does not show a very skewed and leptokurtic distribution. Table 2 shows the normality tests of item total scores to determine item analysis methods.

Table 2: Normality Tests of Total Scores of The Scales

Scales	Kolmogorov-Smirnov Test Statistics	p-values
Pilot scale	0.08	0.20
Draft scale	0.08	0.04
Final scale	0.09	0.02

According to Table 2, total scores obtained from the Pilot scale are distributed normally (p>0,05). Although the Kolmogorov-Smirnov test statistic value for the draft scale is not within normality limits, since the value obtained from the ratio of the total scores obtained from the scale to the standard error of the Skewness coefficient is within the range of (-2,58; +2,58), it was considered to be approximately normally distributed at 1% significance level (Howitt & Cramer, 1997).

The results of the t-test, discrimination power index, item-remainder correlation and regression analysis based on the responses of 77 participants to the 50-item pilot scale are given in Table 3.

Table 3: Results of Item Analysis Methods

Items	t- test		Discrimination power index	Item-remainder correlation	Regression model coefficients p values	
	t-value	p-vale				
M1*	**0.25**	**0.80**	**0.03**	**-0.10**	**-1.05**	**0.66**
M2*	**2.06**	**0.05**	**0.20**	**-0.20**	**-3.05**	**0.19**
M3	**-1.84**	**0.07**	**-0.12**	**0.15**	**4.49**	**0.10**
M4	-4.41	0.00	-0.31	0.49	11.52	0.00
M5	-3.70	0.00	-0.36	0.41	8.10	0.00
M6	-8.41	0.00	-0.52	0.59	12.29	0.00
M7*	**-1.56**	**0.13**	**0.14**	**-0.25**	**-4.55**	**0.07**
M8*	**1.74**	**0.09**	**0.20**	-0.31	-4.29	0.03
M9	-8.76	0.00	-0.56	0.74	15.71	0.00
M10	-8.76	0.00	-0.65	0.74	13.91	0.00
M11	-9.73	0.00	-0.66	0.71	13.39	0.00
M12*	**-1.57**	**0.12**	**-0.14**	**0.17**	**4.52**	**0.61**
M13	-4.49	0.00	-0.33	0.52	12.87	0.00
M14	-5.44	0.00	-0.43	0.64	14.55	0.00
M15	-9.29	0.00	-0.70	0.75	13.70	0.00
M16	-11.14	0.00	-0.68	0.85	16.61	0.00
M17	-8.01	0.00	-0.68	0.70	12.38	0.00
M18	-12.76	0.00	-0.70	0.78	14.32	0.00
M19	-9.49	0.00	-0.70	0.79	14.18	0.00
M20	-8.64	0.00	-0.61	0.74	14.38	0.00
M21	-7.12	0.00	-0.57	0.66	12.37	0.00
M22	-5.77	0.00	-0.53	0.58	10.33	0.00
M23	-8.90	0.00	-0.62	0.72	13.30	0.00
M24	-4.85	0.00	-0.38	0.57	12.84	0.00
M25	-9.04	0.00	-0.68	0.78	14.26	0.00
M26	-11.33	0.00	-0.61	0.74	15.14	0.00
M27*	**-0.34**	**0.00**	**-0.03**	**0.09**	**2.89**	**0.26**
M28	-7.36	0.00	-0.58	0.66	12.05	0.00

M29*	-2.13	0.04	**0.20**	**-0.26**	**-4.32**	**0.06**
M30	-10.04	0.00	-0.65	0.82	15.71	0.00
M31	-10.01	0.00	-0.71	0.83	14.99	0.00
M32	-6.11	0.00	-0.47	0.71	15.52	0.00
M33*	**-0.20**	**1.00**	**0.00**	**-0.07**	**-0.25**	**0.91**
M34	-5.36	0.00	-0.68	0.77	14.29	0.00
M35	-8.41	0.00	-0.62	0.67	12.70	0.00
M36	-4.21	0.00	-0.46	0.45	8.22	0.00
M37*	**-0.85**	**0.40**	**0.10**	**-0.11**	**-0.72**	**0.67**
M38	3.06	0.00	0.30	-0.42	-7.47	0.00
M39	-5.34	0.00	-0.42	0.48	10.65	0.00
M40	-2.96	0.00	0.33	-0.45	-6.74	0.00
M41	-4.14	0.00	0.40	-0.53	-9.00	0.00
M42*	**-0.66**	**0.51**	**0.05**	**-0.11**	**-1.18**	**0.62**
M43*	**-0.43**	**0.67**	**-0.04**	**0.00**	**1.04**	**0.70**
M44*	**-0.59**	**0.56**	**0.07**	**-0.10**	**-0.87**	**0.68**
M45*	**-0.40**	**0.70**	**-0.03**	**0.05**	**2.12**	**0.46**
M46	-3.07	0.00	-0.29	0.42	9.01	0.00
M47	-3.33	0.00	-0.27	0.40	9.74	0.00
M48*	**-0.23**	**0.82**	**0.03**	**-0.03**	**0.55**	**0.78**
M49*	**-0.13**	**0.90**	**-0.01**	**0.04**	**1.81**	**0.46**
M50*	**-1.39**	**0.17**	**0.20**	**-0.17**	**-1.43**	**0.37**

* The items excluded from the pilot scale since $p<0.01$

As a result of the item analyses carried out, it was decided to exclude 17 items from the 50-item pilot scale. Table 4 shows the items which were decided to be excluded from the scale according to item analysis methods.

Table 4: The Items Excluded From The Pilot Scale With Item Analysis Methods and The Remaining Items In The Scale

Item analysis	Items excluded from the pilot scale
Two independent groups t-Test	M1, M2, M3, M7, M8, M12, M27, M33, M37, M42, M43, M44, M45, M48, M49, M50
Item discrimination power index	M1, M2, M3, M7, M8, M12, M27, M29, M33, M37, M42, M43, M44, M45, M48, M49, M50

Item-remainder correlation	M1, M2, M3, M7, M12, M27, M29, M33, M37, M42, M43, M44, M45, M48, M49, M50
Simple linear regression	M1, M2, M3, M7, M12, M27, M29, M33, M37, M42,
Draft scale items	M4, M5, M6, M9, M10, M11, M13, M14, M15, M16, M17, M18, M19, M20, M21, M22, M23, M24, M25, M26, M28, M30, M31, M32, M34, M35, M36, M38, M39, M40, M41, M46, M47

In order to compare item analysis methods, first t-test statistics, discrimination power indices, item-remainder correlations and rank numbers obtained for regression coefficients were calculated (Horst, 1966; Lord, 1968). Spearman rank correlation correlation is used to understand the degree of relationship between the statistical techniques used in item analysis. A correlation value close to 1 indicates that there is good agreement between the methods (Thorndike, 1997).

Table 5 shows the Spearman rank difference correlation coefficients calculated by using the rank numbers found to determine the relationship between item analyses.

Table 5: The Relationship Between Item Analysis Results

	t-Test	**Discrimination power index**	**Item-remainder**	**Simple linear Regression**
t-Test	1.00	0.96**	0.97**	0.93**
Discrimination power index		1.00	0.97**	0.88**
Item-remainder correlation			1.00	0.95**
Simple linear regression				1.00

**p<0.01

According to the correlation values in Table 6, there are statistically significant associations between the item analysis methods used (p<0.01). The result that correlation coefficients are positive and very high shows that the item analysis methods used in determining the items in Post-epidemic Social Relationships Scale are highly compatible with each other (Chadha, 2009; Crocker & Algina, 1986; Thorndike, 1997; Tunç, Komitoğlu & Bekiryazıcı, 2014: 15-24).

The draft scale, which was obtained by reducing the 50-item pilot scale to 33 items after item analysis methods, was applied to 216 individuals by using Google forms. Dimension reduction was performed by preserving most of the changes in data by applying explanatory factor analysis to item scores obtained from the responses of 216 participants to 33-item draft scale. No items were deleted from the draft scale since no correlations lower than 0.25 were found in the correlation matrix. The factors were formed with Principal Components method in the factor analysis performed later. Varimax rotation was applied to clarify the relationship of each item with only one factor. Items M6, M13, M18, M19, M20, M22, M23, M24, M26, M32, M34, M35, M36, M39, M46, M47 which were found to overlap with the Varimax rotation performed in repeated exploratory factor analyses were excluded from the draft scale. Following this, factor analysis was reapplied on the remaining 17 items.

In the factor analysis, Kaiser-Meyer-Olkin (KMO) sampling adequacy value was found as 0.94. This result shows that the sampling adequacy required for the factoring

of the data structure exists. Chi-square value of Bartlett Sphericity test was found as χ^2=3019.08 (p<0.01). While this result expresses the rejection of the hypothesis "correlation matrix equals unit matrix", the correlation level between the items also shows the items should become factors (Büyüköztürk, 2002: 470-483; Chadha, 2009; Pallant, 2007; Tabachnick & Fidell, 2001).

Factor analysis shows that the correlation matrix of the items in the draft scale has 3 eigenvalues higher than 1 and the items of the draft scale will be grouped under 3 factors. Table 6 shows eigenvalues and explained variance values of the draft (n=216) and final (n=438) scale.

Table 6: Variance Explanation Rates Of The Factors Of Draft and Final Scale

Draft scale (33 items ; n=216)			
Factors	**Eigenvalues**	**Explained variance (%)**	**Cumulative explained variance (%)**
Factor 1	7.84	46.12	46.12
Factor 2	2.44	14.35	60.47
Factor 3	2.11	12.40	72.86
Total	12.39	72.87	
Final scale (17 items ; n=438)			
Factors	**Eigenvalues**	**Explained variance (%)**	**Cumulative explained variance (%)**
Factor 1	7.45	43.83	43.83
Factor 2	2.74	16.12	59.95
Factor 3	2.24	13.17	73.12
Total	12.43	73.12	

As a result of the factor analysis conducted, the 3-factor structure found with the application of 17-item final scale to 438 individuals through google forms is shown in Table 7.

Table 7: The Distribution of Draft and Final Scale Items In 3 Factors

Draft scale (30 items n=216)	
Factors	**Items**
Factor 1	M9, M10, M11, M15, M16, M17, M21, M25, M28, M30, M31
Factor 2	M4, M5, M14
Factor 3	M38, M40, M41
Final scale (17 items n=438)	

Factors	Items
Factor 1: Social environment	M1(M9*), M2(M10*), M3(M11*), M4(M15*), M5(M16*), M6(M17*), M7(M21*), M8(M25*), M9(M28*), M10(M30*), M11(M31*)
Factor 2: Social distance	M12(I38*), M13(I40*), M14(I41*)
Factor 3: Public space	M15(M4*), M16(I5*), M17(M14*)

(*) Original item numbers in the draft scale

According to the factor analysis results of the final scale, the items in Factor 1 were called “Social environment relationship factor” since they included socializing behaviors and the environment they would be in after the epidemic. The items in Factor 2 were called “Social distance factor” since they included the distance people had to put physically between themselves with the epidemic. Finally, the items in Factor 3 were called “Public space relationship factor” since they included the actions individuals had to perform for being in communal settings within institutional context. The internal consistency of the Likert-type attitude scale is based on the assumption that all items in the scale measure the same feature. Many coefficients have been developed for this purpose. The most widely used internal consistency coefficient is Cronbach Alpha. A scale with an internal consistency coefficient greater than 0.60 is considered reliable (Thorndike, 1997).

Table 8 shows the Cronbach Alpha internal consistency coefficients of the pilot, draft and final scales.

Table 8: Cronbach Alpha Reliability Coefficients

Scales	Number of items	Number of observations (n)	Reliability coefficients
Pilot Scale	50	77	0.88
Draft Scale	33	216	0.96
Final Scale	17	438	0.95

According to Table 8, high reliability coefficients show that each scale has a perfect level of reliability and all scales can be used in measuring a phenomenon (Özdamar, 1999; Pallant, 2007). After the 17-item Post-epidemic Social Relationships Scale (PESRS) was finalized, it was applied to a new sample (n=438) and it was found with confirmatory factor analysis whether the final scale items were in the same factors and goodness of fit criteria were calculated. As a result of confirmatory factor analysis, the factors and item distributions of PESRS scale was found to be as follows (Appendix A2):

Social environment relationship factor : 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11

Public space relationship factor : 12, 13, 14

Social distance factor : 15, 16, 17

Figure 1 shows the path diagram of the confirmatory factor analysis results obtained.

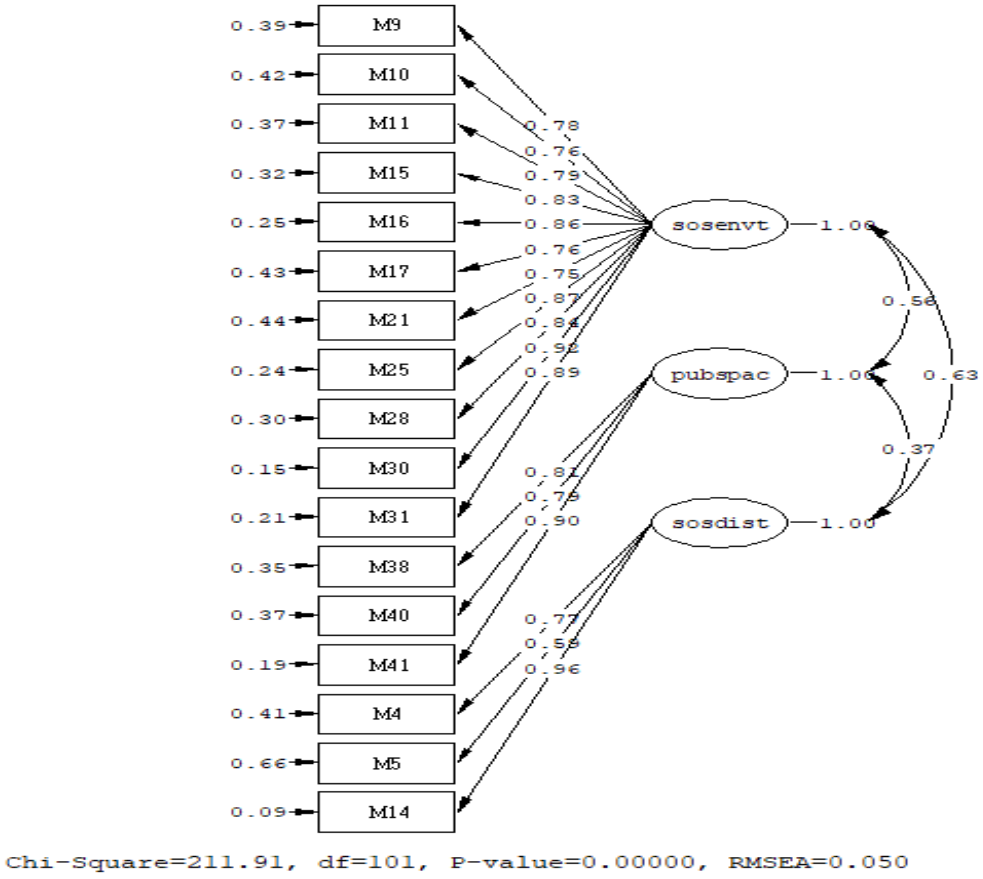

Figure 1: Post-epidemic Social Relationships Scale (PESRS) Path Diagram

The square of the standardized path coefficients (factor loads) in the path diagram in Figure 1 give the marginal contribution of the item to the relevant factor. According to this, the fact that all of the coefficients have values larger than 0.5 mean that the item in the proposed model has a large effect on the related factor (Cohen, 1988). The statistical significance and coefficient of determination of the standardized path coefficients of the proposed model are given in Table 9.

Table 9: Statistical Significance And Determination Coefficients of The Factor Loads

Factors/Items	Standardized factor loads	t-values	Coefficient of determination (R^2)
Social environment relationship factor $(\alpha_1 = 0.960)$			
M1 (M9)	0.78	19.25*	0.61

M2 (M10)	0.76	18.48*	0.58
M3 (M11)	0.79	19.71*	0.63
M4 (M15)	0.83	21.02*	0.68
M5 (M16)	0.86	22.39*	0.75
M6 (M17)	0.76	18.46*	0.57
M7 (M21)	0.75	18.06*	0.56
M8 (M25)	0.87	22.88*	0.76
M9 (M28)	0.84	21.41*	0.70
M10 (M30)	0.92	25.35*	0.85
M11 (M31)	0.89	23.60*	0.79
Social distance factor $(\alpha_2 = 0.871)$			
M12 (M38)	0.81	19.43*	0.65
M13 (M40)	0.79	18.91*	0.63
M14 (M41)	0.90	22.71*	0.81
Public space relationship factor $(\alpha_3 = 0.744)$			
M15 (M4)	0.76	13.64*	0.58
M16 (M5)	0.59	13.43*	0.35
M17 (M14)	0.94	26.11*	0.88

*p<0.05

The fact that all of the standardized factor load coefficients were statistically significant (p<0.05, t>1.96) is an indicator that the developed scale is reliable in measuring the social relationships pattern. Internal consistency coefficients of the factors are higher than 0.7. This shows that the items in the factors come together and measure the related phenomenon consistently and with high reliability (Alpar, 2011). Table 10 shows the goodness of fit criteria and threshold values for the proposed model (developed scale) and the goodness of fit criterion values for the proposed model (developed scale) (Schermelleh-Engel & Moosbrugger, 2003: 23-74).

Table 10: Model Fit Values and Goodness of Fit Criteria Threshold Values of PESRS Scale

Goodness of fit criteria	Good fit*	Acceptable fit**	Goodness of fit criterion values of PESRS Scale
[1]χ^2 /sd	$0 \le \chi^2/sd \le 2$	$2 \le \chi^2/sd \le 3$	2,107(212.85 /101)**
[2]AGFI	0.90≤AGFI<1.00	0.85≤AGFI<0.90	0.92*
[3]GFI	0.95≤GFI<1.00	0.90≤GFI<0.95	0.95*
[3]NFI	0.95≤NFI<1.00	0.90≤NFI<0.95	0.99*

[3]NNFI (TLI)	0.95≤NFI<1.00	0.90≤NFI<0.95	0.99*****
[3]CFI	0.95≤CFI<1.00	0.90≤CFI<0.95	0.99*****
[4]RMSEA	0.0<RMSEA≤0.05	0.05<RMSEA≤0.08	0.05*****
[4]SRMR	0.00 ≤ SRMR ≤ 0.05	0.05 ≤ SRMR ≤ 0.10	0.04*

[1](Kline, 2016), [2](Schermelleh-Engel & Moosbrugger, 2003), [3](Baumgartner & Homburg, 1996; Bentler, 1980; Bentler & Bonett, 1980; Marsh, Hau, Artelt, Baumert & Peschar, 2006), [4](Browne & Cudeck, 1993)

According to Table 10, it can be seen that all goodness of fit criteria of the scale such as RMSEA (≤0.05), SRMR (<0.05) which shows that the scale is both valid and reliable and measures one phenomenon with 3 factors consistently and GFI, AGFI, NFI, NNFI, CFI (>0.90) which show the items' levels of explanation, model goodness and fit were within the "good fit" limits.

Discussion

Epidemics show that significant changes have occurred in the lives of people throughout history. In addition to being a health problem, epidemics also leave significant effects on the political, economic and social lives of societies. In this sense, epidemics show their effects in almost all areas of social life. Even if the danger for epidemic is eliminated, a significant part of the precautions taken during the epidemic continue after the epidemic. Especially if considered within the context of social interaction processes, social relationships are reconstructed around specific norms and values during and after the epidemic process. The main determining factor of all these processes related to the epidemic and post-epidemic process is shaped depending on the feeling of trust. While all social relationships are organized depending on the degree of trust, the measures taken within the scope of the epidemic have become more evident with the control of social life.

The aim of the present study was to develop a valid and reliable Likert type scale that can measure how the measures taken during the epidemic process are reflected on the post-epidemic social relationships. Likert type scales are measurement tools developed to gather information about the properties to be measured. Since the content validity of the scale is of primary importance, factor analysis was conducted to group the scale to its basic factors. The items in the scale were evaluated considering the related literature and the factors of the scale were determined as social environment, public space and social distance. After the pilot study (n=77), the unrelated items were deleted with item analysis methods and the draft scale was created. The draft scale was applied to 216 individuals and the items which did not sufficiently explain the phenomenon measured with factor analysis were deleted and the final scale which included 17 items and 3 factors was reached. It was shown that the final scale met all of the scale development criteria and successfully measured a single phenomenon with 3 factors. Lastly, the 17-item final scale was applied to a sample group of a total of 438 individuals, 177 females and 261 males, and validity and reliability study was conducted. In line with the data obtained from the new sample the

final scale was applied, confirmatory factor analysis results and all goodness of fit criteria can be shown as a proof that the developed scale is a successful and consistent tool to measure social relationships with its 3 factors. However, the re-application of PESRS scale on different sample groups is very important for the standardization of the scale.

In this context, while the high scores obtained from the PESRS sub-dimensions express participation in the immediate environment and public environment and complying with social distance; low scores will mean not participating in the close environment and collective environment and not complying with social distance. These results are show that the PESRS is a valuable measurement tool in measuring the impact of Covid-19 on our social lives.

According to these results, it is obvious that the PESRS scale, which evaluates social relationships within the context of social environment, public space, and social distance factors, is a valid and reliable measurement tool. So, It has a power to measures social relationship. Using this tool in the scientific studies in this area will contribute to both validity and reliability of the scale and to this literature too.

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1. Contribution Rate Statement Of Researchers:
[*] /First Author %50,
[**] /Second Author %50

2. No Potential Conflict Of İnterest Was Reported By The Authors.

Appendıx – A1

Post-Epidemic Social Relationships Scale (Pesrs)

Dear participant;

This survey form was created for a sociological research conducted to find out how post-epidemic period will affect our social relationships. There are some statements below for this scientific study and you are asked to indicate to what extent these statements are true for you. Each statement is graded as 0 (not true), 1 (rarely), 2 (sometimes), 3 (often), 4 (very often). Please read each statement carefully and consider how suitable these statements are for you, AFTER THE PANDEMIC. Tick one of the boxes to show to what extent the statements are true for you. Responding fully, sincerely and in a realistic way will contribute to achieving the purpose of the study.

Thank you very much for your valuable help and contributions.

Best regards.

Item Number	Items	Not true	Rarely	Sometimes	Often	Very often
1	I can visit other people's homes with my family.	0	1	2	3	4
2	I can get together with our neighbours in homes.	0	1	2	3	4
3	I can easily visit my close relatives.	0	1	2	3	4
4	I can go to picnic areas with my relatives.	0	1	2	3	4
5	I can meet my friends in indoor places such as cafe.	0	1	2	3	4
6	I can participate in team sports.	0	1	2	3	4
7	I can go to the barber/hairdresser.	0	1	2	3	4
8	I can travel for sightseeing with my relatives.	0	1	2	3	4
9	I can hug my relatives.	0	1	2	3	4
10	I can eat out with my friends	0	1	2	3	4
11	Guest(s) can come to our house.	0	1	2	3	4
12	I try to stay away from people due to infectious diseases.	0	1	2	3	4
13	I feel uncomfortable shaking hands even with someone I know.	0	1	2	3	4
14	I'll try to stay away from people at school or workplace.	0	1	2	3	4

15	I can go to shopping malls.	0	1	2	3	4
16	I can perform my prayers in mosque with congregation.	0	1	2	3	4
17	I can easily go to health institutions (Hospital, family health centre, pharmacy).	0	1	2	3	4