Psychometric Properties of the Hikikomori Questionnaire (HQ-25) in Türkiye

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Abstract

Hikikomori, which means 'social withdrawal' in Japanese, has been seen in a variety of cultures, particularly in developed countries and in the Far East region. The 25-item Hikikomori Questionnaire (HQ-25) is a scale designed to assist in the evaluation of hikikomori, but few studies have examined its psychometric properties in populations outside Japan. The aim of this study was to examine the psychometric properties of a shortened version of the HQ-25. The sample consisted of 501 Turkish participants between 12 and 65 years of age. Data analyses included examination of descriptive statistics, outliers, and normal distribution (skewness-kurtosis), as well as exploratory and confirmatory factor analysis (EFA and CFA respectively), Cronbach alpha and "split-half" for internal consistency and reliability, and Average Variance Extracted (AVE) and Composite Reliability (CR) for convergent and discriminant validity. A single factor model with 8 items from the HQ-25 was formed. Results demonstrated adequate psychometric properties for a single factor structure of an 8-item version of the Hikikomori Questionnaire (HQ-8). This study provides preliminary evidence of the reliability and validity of a brief version of the Hikikomori Questionnaire (HQ-8) in a sample of adults in Türkiye.

Keywords: Hikikomori, Cultural syndrome, Diagnosis, Mental health, Psychometric, Social withdrawal, Social isolation.

Hikikomori Ölçeği'nin (HQ-25) Psikometrik Özelliklerinin İncelenmesi

Öz

Japonca'da 'sosyal geri çekilme' anlamına gelen Hikikomori, başta gelişmiş ülkeler ve Uzak Doğu bölgesi olmak üzere çeşitli kültürlerde görülmüştür. 25 maddelik Hikikomori Anketi (HQ-25), hikikomori'nin değerlendirilmesine yardımcı olmak için tasarlanmış bir ölçektir. Ancak Japonya dışındaki popülasyonlarda psikometrik özelliklerini inceleyen çok az çalışma vardır. Bu çalışmanın amacı, HQ-25'in kısaltılmış bir versiyonunun psikometrik özelliklerini incelemektir. Örneklemi, 12-65 yaş arası 501 Türk katılımcı oluşturmuştur. Veri analizleri tanımlayıcı istatistikler, aykırı değer ve normal dağılım (çarpıklık-basıklık) incelenmesinin yanı sıra, Açıklayıcı ve Doğrulayıcı Faktör Analizi (sırasıyla AFA ve CFA), iç tutarlılık güvenilirliği için Cronbach Alfa ve "iki yarı test güvenirliği" (Split-Half), yakınsak ve ıraksak geçerlilik için Ortalama Açıklanan Varyans (AVE) ve Bileşik Güvenilirlik (CR) değerlerini içermektedir. HQ-25'ten 8 maddelik tek faktörlü bir model oluşturulmuştur. Sonuçlar, Hikikomori Ölçeği'nin (HQ-8) 8 maddelik versiyonunun tek faktörlü yapısı için yeterli psikometrik özellikler gösterdi. Bu çalışma, Hikikomori Ölçeği'nin (HQ-8) kısa bir versiyonunun Türkiye'deki bir yetişkin örnekleminde güvenilirliğine ve geçerliliğine ilişkin ön kanıtlar sunmaktadır.

Anahtar Kelimeler: Hikikomori, Kültürel sendrom, Teşhis, Akıl sağlığı, Psikometrik, Sosyal çekilme, Sosyal izolasyon.

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INTRODUCTION

As is known, the COVID-19 pandemic has also led to a negative impact on mental health along with many citizens being locked in their homes and entering the quarantine (social isolation) process. The best example pointing out to this mental health problem caused by severe social isolation is what is known as hikikomori, a form of severe social withdrawal described in Japan in the late 20th century and recently discovered around the world (Kato et al., 2020). At this point, it should be known that there are similarities and differences between Hikikomori and social isolation related to COVID-19. When hikikomori and social isolation are considered together, there is a deliberate escape from the socialization process while it should be accepted that there may be some reasons such as necessity (government restrictions) and / or fear of infection in the process of COVID-19 and social isolation (Kato et al., 2020). Currently, the diagnostic criteria for hikikomori are as follows: significant social isolation in one's home; continuous social isolation process of at least 6 months; significant functional impairment or distress associated with social isolation. Four aspects of this revised definition of Hikikomori are emphasized. The first one is that individual is in the process of "significant social isolation in one's home". By definition, the frequency of going out of the house is a factor here. People leaving their home 4 days or more a week do not meet the Hikikomori criteria. Secondly, they are in the process of "social isolation of at least 6 months". During the 6-month isolation period here, it has been reported that individuals generally have very little interaction together with the denial of social interaction. Third, they experience "significant functional impairment or distress associated with social isolation". In this process, distress or functional impairment is vital and should be carefully evaluated since Hikikomori is a pathological condition. Especially in the early stages of this situation, it has been reported regarding the social isolation process that not being outside allows individuals to escape from the painful realities of life and in this respect, they experience satisfaction with a sense of relief. However, as the duration of social isolation gets longer, most individuals also confirm that there are some negative sides such as loneliness. Fourth, it is accepted as an exclusion criterion for Hikikomori's assumptions that it is a "psychiatric disorder". As it is clear that Hikikomori tends to occur not alone but with various psychiatric disorders that contribute to psychopathology. These simplified diagnostic criteria can be a standard for evaluating Hikikomori case (Kato et al., 2020).

In Türkiye, Hikikomori poses a threat to young people and expert psychologists draw attention to the fact that these young people, who do not leave their rooms and play computer games all the time, become antisocial and do not talk to anyone and they need serious treatment. However, it is emphasized that Hikikomori is not considered as a disease and is not noticed by many parents in Türkiye although this problem is obvious (Hürriyet Kelebek, 2007).

According to Kasak et al. (2022), a 15-year-old male adolescent who did not go to school for one year, did not leave his room except for his physical needs, and cut off social communication with everyone, including his family, was handled as a case. As a result of the clinical examination, the social isolation of the patient was found to be associated with the hikikomori syndrome. This is the first report of hikikomori in Türkiye. This case of hikikomori in Türkiye shows that hikikomori can be seen not only in Japan but also in other countries. In this respect, it is important to support

hikikomori as an intercultural syndrome. This study will be a source for questioning the cases in Türkiye as well as raising awareness for the Turkish society on hikikomori rising in Japan and other Far East countries and gaining a global dimension with each passing day.

The Hikikomori Scale (HQ-25) was developed by Teo et al. (2018). In the current study, our aim is to develop an abbreviated version of HQ-25. In addition, during the development of the original scale, analyzes of its psychometric properties will be carried out by completing the deficiencies related to the validity of the scale.

MATERIAL and METHODS

Participants
The study was conducted in 501 participants for general screening purpose without distinguishing between clinical cases and non-clinical cases. The study was conducted on 225 females (Mean age =30.39 ± 10.97) and 276 males (Mean age =27.19 ± 9.33) for a total of 501 Turkish participants (Mean age=28.63 ± 10.21] aged between 12 and 65 years. Data were collected via an online form (various social networking platforms, e-mail, etc.). Approval was obtained from all participants for the written information form in the application link.

Instrument
The Hikikomori Scale (HQ-25) consists of 25 items measured on a 4-point Likert scale (0 "strongly disagree"……… 4 "strongly agree"), which evaluates hikikomori at three levels (socialization, isolation and emotional support). Scale scores are the sum of all items for each subscale; there are reversed items. The HQ-25 has a score range of 0-100.

Data Analyses
In the study, analyses were carried out by considering the limitations and suggestions in the previous study (Teo et al., 2018) in the creation of a different structure of HQ-25.
In order to determine the factor structure of the HQ-25, we used Principal Axis Factoring (PAF), a method that includes both the common variance and the error variance (Fabringer, Wegener, MacCallum and Strahan, 1999; Tabachnick and Fidell, 2001) and can reveal the latent structures between the variables measured (Cattell, 1978; Fabringer et al., 1999; McDonald, 1985). Next, confirmatory factor analysis (CFA) was performed by using the commonly used maximum likelihood (ML) estimation method through the Analysis of Moment Structures 23. (AMOS 23.) program (Brown and Moore, 2012). Finally, "Cronbach Alpha" and "Split-Half" were used for the reliability of the three measurement models for internal consistency; in order to determine the discriminant validity, the Average Variance Extracted (AVE), and the Composite Reliability (CR) values were calculated with the help of the formula in the Excel program.

RESULTS

Analyses were carried out to create a short version of the HQ-25. The analysis procedures performed are given below under the sub-headings respectively.

Determination of Sample Size (Suitability for Factor Analysis)

First of all, the suitability of the sample group for factor analysis was determined. According to the analyses performed, the Kaiser-Meyer-Olkin (KMO) value of 0.90 and the Barlett test value of 1364.602 ($p< .000.$, sd= 28) showed that the dataset was suitable for factor analysis (Field, 2009).

Item Analysis Based on Correlations

In Likert type scales, which are one of the techniques for measuring attitudes, the item discrimination index can be computed using different techniques (Şahin & Gülleroğlu, 2013). Calculating the correlations between each item and the scale score is the first objective control proposed by Likert. If the sign of the correlation coefficient calculated in this way for an item is negative and its value is zero or close to zero, this indicates that the item is insufficient to measure the attitude that is intended to be measured with other items. Items with a low correlation with the scale score (the sum of other items) may contribute little to the measurement of the attitude that is intended to be measured by the final scale. The same is true for the relationship of a substance with other substances. The reliability and validity of a scale created by bringing together items that are low or unrelated will be low. As a result, items with low correlations should be removed and not included in the final scale. Items to be included in the final scale should have high correlations. The fact that the items have high correlations with each other and with the scale scores is an indication that they measure in the same dimension (Ghiselli et al., 1981).

In this context, analyses were carried out to create a short version of the HQ-25. In the study, statistics for item scores were determined via the techniques of correlation and factor analysis. In the correlation technique, among the items in the 3 sub-dimensions of HQ-25 namely socialization, isolation, and emotional support, the items with the highest correlation and distinctiveness that could measure the features to be measured were selected. The results of the items selected following the analysis are given in Table 1.

Table 1. Selected item numbers and correlation coefficient

Sub-Dimensions	Selected Item Numbers	Correlation Coefficient (r)
Socialization	Item 6 / Item 8 / Item 23	0,59 / 0,60 / 0,60
Isolation	Item 2 / Item 5 / Item 9 / Item 12 / Item 19	0,40 / 0,65 / 0,56 / 0,60 / 0,55
Emotional Support	…………………………………	………………………………………………..

When Table 1 is examined, it has been found that item 6 (r=0.59), item 8 (r=0.60), item 23 (r=0.60) are found in the "socialization" sub-dimension; item 2 (r=0.40), item 5 (r=0.65), item 9 (r=0.56), item 12 (r=0.60) and item 19 (r= 0.55) are found from the "isolation" sub-dimension and when the correlation coefficients for both sub-dimensions are examined, it is seen that the lowest correlation

coefficient is 0.40 while the highest correlation coefficient is 0.65. Since the items in the "Emotion support" sub-dimension were below the criterion (the lowest correlation coefficient of 0.40 and above), no item was selected. In this regard, Explanatory Factor Analysis (EFA) was carried out with the selected items. Analysis results are given in Table 2.

Table 2. Factor loadings for the selection of highly correlated items suitable for the concept of "social withdrawal" included in the Hikikomori Questionnaire

Selection of highly correlated items suitable for the concept of "social withdrawal" Number	Item text	Factor 1	Variance %
Item 5	I shut myself in my room.	0.721	
Item 23	I don't enjoy social interactions.	0.680	
Item 8	I feel uncomfortable around other people.	0.671	
Item 12	I rarely meet people in-person.	0.671	% 47.64
Item 6	People bother me.	0.652	
Item 19	I have little contact with other people talking, writing, and so on.	0.614	
Item 9	I spend most of my time alone.	0.605	
Item 2	I spend most of my time at home.	0.430	

In Table 2. Explanatory Factor Analysis (EFA) was performed with the items with the highest correlation values in the 3 sub-dimensions of HQ-25 namely socialization, isolation and emotional support. Principal Axis Factoring (PAF) method was chosen as the method.

As a result of the factor analysis carried out with the selected items. it is seen that a structure consisting of 8 items and a single factor has emerged. The single factor structure with 8 items was named HQ-8. While factor load values for the items of HQ-8 ranged from ".43 to .72" the variance explained by the items was determined to be 47.64%.

The items and contents related to the HQ-8 factor were accepted as item 5 (I shut myself in my room), item 23 (I don't enjoy social interactions), item 8 (I feel uncomfortable around other people), item 12 (I rarely meet people in-person), item 6 (People bother me), item 19 (I have little contact with other people talking, writing, and so on), item 9 (I spend most of my time alone), item 2 (I spend most of my time at home).

Confirmatory Factor Analysis (CFA) was performed to confirm the 8-item single factor structure of HQ-8. The path diagram of the 8-item single factor structure of the HQ-8 and the fit indices regarding the model are shown in Figure 1 and Table 3.
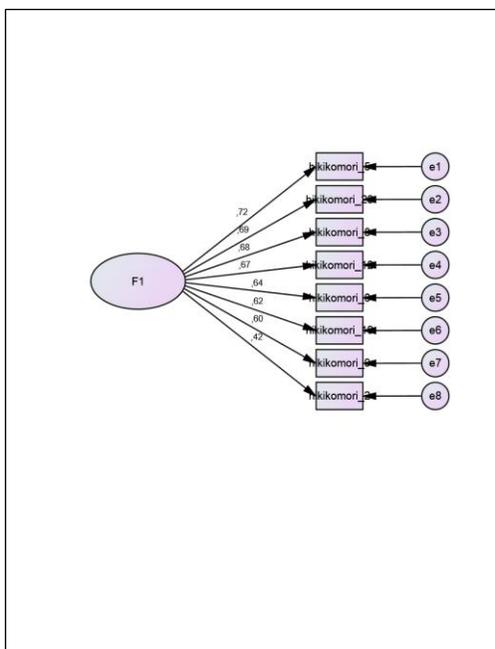
Figure 1. HQ-8 Path Diagram

Table 3. Fit indices Hikikomori Questionnaire (HQ-8)

Fit indices	x2/sd	CFI	GFI	AGFI	NFI	TLI	RMSEA
HQ-8	2.13	0.98	0.98	0.96	0.97	0.97	0.04

X2 =Chi-Square, df=Degree of Freedom. GFI=Goodness of Fit Index. CFI=Comparative Fit Index. RMSEA=Root Mean Square Error of Approximation. RMR= Root Mean Square Residual. NFI= Normed Fit Index. TLI= Tucker-Lewis Index

In Table 3, the fit indices of the Confirmatory Factor Analysis (CFA) results performed by using the maximum likelihood (ML) estimation method of HQ-8 range within (x2/sd= 2.13; CFI= 0.98; GFI= 0.98; AGFI= 0.96; NFI= 0.97; TLI= 0.97; RMSEA= 0.04).

Discriminant Validity

The development or adaptation of scales is often associated with the application of a factor analysis (EFA, CFA) and further testing to establish the validity of measures (i.e., convergent, discriminant). Farrell (2009) emphasized the necessity of reviewing discriminant validity in scale development and adaptation studies. If a factor analysis is misinterpreted, and discriminant validity is not established, then scales used in research may not function correctly, and conclusions made regarding relationships between constructs under investigation may be incorrect. CR and AVE values use to reveal discriminant validity (the relationship of expressions with the structure they are attached to) (Hair et al., 2009).

In addition to the structural validity of the HQ-8, analyzes were also performed for its discriminant validity. For this purpose, the Average Variance Extracted (AVE), and the Composite Reliability (CR) values were calculated with the help of formulas in Excel. Analysis results are indicated in Table 4.

Table 4. HQ-8 AVE and CR Values for HQ-8

Item number	Item text	AVE	CR
Item 5	I shut myself in my room.		
Item 23	I don't enjoy social interactions.		
Item 8	I feel uncomfortable around other people.		
Item 12	I rarely meet people in-person.		
Item 6	People bother me.		
Item 19	I have little contact with other people talking, writing, and so on.	0.40	0.84
Item 9	I spend most of my time alone.		
Item 2	I spend most of my time at home.		

In Table 4, the AVE, and CR values of HQ-8 are given. Accordingly, the AVE value of the single-factor structure of HQ-8 was 0.40, and the CR value was 0.84.

Reliability Analysis

Cronbach Alpha and Split-Half reliability methods were preferred for the reliability of HQ-8. Analysis results are indicated in Table 5.

Table 5. Cronbach's Alpha Coefficients, Spearman-Brown Coefficient and Guttman Split Half Coefficient for HQ-8

Item number	Item text	Cronbach's Alpha Coefficients (α)	Split-Half	
			Spearman-Brown Coefficient	Guttman Split Half Coefficient
Item 5	I shut myself in my room.			
Item 23	I don't enjoy social interactions.			
Item 8	I feel uncomfortable around other people.			
Item 12	I rarely meet people in-person.			
Item 6	People bother me.	0.83	0.87	0.87
Item 19	I have little contact with other people talking, writing, and so on.			
Item 9	I spend most of my time alone.			
Item 2	I spend most of my time at home.			

In Table 5, the Cronbach Alpha and Split-Half reliability values of HQ-8 are given. The Cronbach Alpha coefficient was calculated as 0.83. The Spearman-Brown formula provides an estimate, based on the split-half correlation, of the reliability of the test as a whole. Following the procedures performed with the formula [r Test= (2r/1+r); r= correlation coefficient of half-test] on the values obtained after the Split-Half analysis conducted regarding HQ-8, Spearman-Brown value and Guttman value were calculated as 0.87.

DISCUSSION

Hikikomori, which means 'social withdrawal' in Japanese, is known as a mental health problem, which is very common among young people in the Far East region today and is observed especially in people who use technology intensively. With the purpose of addressing the Hikikomori problem which has yet to be confirmed with measurement tools and has a high potential to be seen in all developed countries, Teo et al., (2018) have developed a measurement tool called The Hikikomori Questionnaire (HQ-25). The starting point of the current study was the fact that there were limitations that the psychometric properties were not adequately evaluated in the development study of the measurement tool. The aim of the current study was to conduct additional psychometric testing of the Hikikomori Questionnaire (HQ-25) developed by Teo, et al. (2018). Analyzes were carried out to create a short version of the HQ-25. In the study, statistics for item scores were determined via the techniques of correlation and factor analysis. In the correlation technique, among the items in the 3 sub-dimensions of HQ-25 namely socialization, isolation, and emotional support, the items with the highest correlation and distinctiveness that could measure the features to be measured were selected. The reason for choosing the item in the study; during the development of the HQ-25, no Confirmatory Factor Analysis (CFA) was performed on the sample group (mixture of clinical population and healthy volunteers, not conducting on young population) regarding psychometric properties of the scale, whether a short revised form could be created, taking into account only the socialization factor, removal of reverse-scored items or the creation of a factor structure in a different way (Teo, et al., 2018). In this regard, analyses were carried out by considering the limitations and suggestions in the previous study (Teo et al., 2018) in the creation of a different structure of HQ-25. We were especially interested in creating a shorter version of the Hikikomori Questionnaire based on a different factor structure from the original HQ-25. Our analyses revealed a single-factor structure with 8 items ($x^2/sd= 2.13$; CFI= .98; GFI= .98; AGFI= .96; NFI= .97; TLI= .97; RMSEA= .04) that possesses excellent fit values (Schumacher & Lomax, 1996; Schermelleh & Moosbrugger, 2003). This study provides some of the first evidence of robust psychometric properties of a shortened, 8-item version of the Hikikomori Questionnaire. AVE, CR values of the HQ-8 were calculated as 0.40, 0.63 and 0.84, respectively. While AVE value ($0.50 < …$) and CR value ($0.70 < …$) are expected in the literature (Hair et al., 2009), it is seen that the average explained variance values in the study are below the critical value of 0.50. Fornel and Larcker (1981), on the other hand, reported that although the AVE value is below 0.50, the AVE values below 0.50 can be accepted as the CR value is above 0.70. The Cronbach Alpha coefficient of the HQ-8 was found as 0.83, the Spearman-Brown value was 0.87 and the Guttman value was 0.87. These values suggest that the HQ-8 is valid and reliable.

Data on the psychometric properties of the 25-item Hikikomori Questionnaire (HQ-25) in other populations are still scarce. When the cultural adaptation studies on the subject were examined in the literature, it was seen that Amendola et al. (2022b) made an adaptation study to the Italian adolescent population by examining the psychometric properties of the 25-item Hikikomori Questionnaire (HQ-25). Analysis results indicated strong psychometric properties and diagnostic accuracy for a 25-item questionnaire. The researchers reported that the study had some limitations. Therefore, the scale cannot be generalized to other groups or populations, such as adults or

adolescents with psychiatric disorders. It has been reported that additional study is required in Italian and other participant samples to increase clinical validity and determine the most appropriate limit.

In another study by Amendola et al. (2022a) the psychometric properties of the Italian version of HQ-25 with an adult sampling were tested. As a result of CFA, it was determined that a three-factor model fit better than a one-factor solution. Results reported that the scale showed good psychometric properties with the sample of Italian adults aged 18-50 years. The researchers reported that the study had some limitations. Therefore, generalization of the results to other groups or populations cannot be possible. In addition, as a result of the analysis, the factor loads of item 7 (0.151) and item 21 (0.312) were low. It has been reported that this situation may be due to the difference of the samplings. It is possible that these items may not be as adequately representative of emotional support as they were in clinical participants, as in the original study by Teo et al.   Past studies of HQ-25 (Fino et al., 2022; Hu, et al., 2022; Amendola et al., 2022b) reported no confirmation or information on factor loadings. Such differences may also be due to "naturally expected" cultural differences between the Italian population and the Japanese or Turkish population.

The psychometric properties of the Italian version of the 25-item Hikikomori Questionnaire (HQ-25-I) were tested in a community and clinical sample by Fino et al. (2022). The results showed that the original scale model fitted the data well and was constant between the two groups. The results of the study reported that the HQ-25-I is reliable, but its validity needs to be examined further.

LIMITATIONS AND FUTURE DIRECTIONS

There are several limitations to this study. First, the sample was a convenience sample. Second, clinical evaluation for the presence of hikikomori was not done in this study, and thus it is not known whether individuals with hikikomori were included in the study. Third, no measures of psychiatric symptoms, psychological health, or quality of life were included in this study. Further research examining the comparison between the HQ-8 and such measures is warranted. Finally, further research on the HQ-8 in different cultures, settings and populations is necessary.

CONCLUSIONS

The HQ-8, an abbreviated form of the HQ-25, shows preliminary evidence of being a valid and reliable measurement tool that can be used to help in the assessment of a relatively new mental health problem.

Conflict of Interest: There is no conflict of interest.

Availability of data and materials. The datasets used and/or analyzed during the current study are available from P.G.G. author on reasonable request.

Researchers' Contribution Rate Statement: Conceptualization, A.R.T., methodology, Ö.Y.T, P.G.G., M.E.D, data collection, P.G.G, M.E.D, analysis, Ö.Y.T, writing—original draft preparation, Ö.Y.T, A.R.T., P.G.G., M.E.D, writing—review and editing, Ö.Y.T, A.R.T All authors have read and agreed to the published version of the manuscript.

Ethical Approval: Ethical rules in accordance with the Helsinki Universal Declaration were followed in this study.

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APPENDIX

Hikikomori Questionnaire (HQ-8)- (PROPOSED)	
Hikikomori Questionnaire (HQ-8)	**Accepted Item**
Item 5	I shut myself in my room.
Item 23	I don't enjoy social interactions.
Item 8	I feel uncomfortable around other people.
Item 12	I rarely meet people in-person.
Item 6	People bother me.
Item 19	I have little contact with other people talking, writing, and so on.
Item 9	I spend most of my time alone.
Item 2	I spend most of my time at home.

Note: Selection of highly correlated items suitable for the concept of "social withdrawal" Number