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# Prodromal Questionnaire-16 (PQ-16): Validity and Reliability Study in Turkish

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**ABSTRACT**
**Objective:** Early recognition of psychosis could reduce functional decline and healthcare costs by positively affecting the course of the disorder. Thus, the use of fast and reliable screening tools is crucial. The study investigated the psychometric properties of the Turkish version of the Prodromal Questionnaire-16 (PQ-16). **Materials and Methods:** This methodological research was conducted with individuals aged 18–65 years between June-December 2024. Data collection instruments included the Personal Information Form and PQ-16. The scale was evaluated through language and content validity, exploratory and confirmatory factor analyses, convergent and discriminant validity, item–total correlations, internal consistency (Cronbach's alpha), and test–retest reliability. **Results:** The exploratory factor analysis confirmed the 16-item structure, identifying three factors that accounted for 41.85% of the variance. The confirmatory factor analysis also supported this model. Cronbach's alpha was calculated as 0.80, with item loadings ranging from 0.31 to 0.59. Test–retest analysis indicated strong reliability ($r = 0.922$, $p < 0.01$). **Conclusion:** The results indicate that the Turkish PQ-16 is both a valid and reliable measurement tool. Its short and practical format makes it effective in detecting prodromal symptoms of psychosis. Therefore, the scale is recommended for use in early detection efforts by mental health professionals.
**Keywords:** Psychotic Disorders, Reliability and Validity, Scale, Signs and Symptoms.

# Prodromal Belirti Ölçeği-16 (PBÖ-16): Türkçe Geçerlik ve Güvenirlik Çalışması

**ÖZ**
**Amaç:** Psikozun erken dönemde tanınması, hastalığın seyrini olumlu yönde etkileyerek işlevsel kayıpların azaltılmasına ve sağlık harcamalarının düşürülmesine katkı sağlayabilir. Bu nedenle hızlı ve güvenilir tarama araçlarının kullanımı büyük önem taşımaktadır. Bu nedenle bu çalışma, Prodromal Belirti Ölçeği-16'nın (PQ-16) Türkçe formunun psikometrik özelliklerini incelemeyi amaçlamıştır. **Gereç ve Yöntem:** Metodolojik nitelikteki bu araştırma, Haziran–Aralık 2024 tarihleri arasında 18–65 yaş aralığındaki bireylerle yürütüldü. Veri toplama araçları olarak Kişisel Bilgi Formu ve PQ-16 kullanıldı. Ölçeğin dil ve kapsam geçerliliği, açımlayıcı ve doğrulayıcı faktör analizleri, yakınsak ve ayrışan geçerlilik, madde-toplam korelasyonları, iç tutarlılık katsayısı (Cronbach alfa) ve test–tekrar test güvenirliği değerlendirildi. **Bulgular:** Açımlayıcı faktör analizi, ölçeğin 16 maddelik yapısını doğrulamış ve üç faktörün toplam varyansın %41.85'ini açıkladığını gösterdi. Doğrulayıcı faktör analizi sonuçları da bu modeli destekledi. Cronbach alfa katsayısı 0.80 olarak ve madde yükleri 0.31 ile 0.59 arasında bulundu. Test–tekrar test analizi, yüksek düzeyde güvenirlik gösterdi ($r = 0.922$; $p < 0.001$). **Sonuç:** Elde edilen bulgular, PQ-16'nın Türkçe formunun geçerli ve güvenilir bir ölçme aracı olduğunu ortaya koymaktadır. Ölçeğin kısa ve pratik yapısı, psikozun prodromal belirtilerinin belirlenmesinde etkinliğini artırmaktadır. Bu nedenle, ruh sağlığı alanında çalışan profesyoneller tarafından erken tanılama süreçlerinde kullanılması önerilmektedir.
**Anahtar Kelimeler:** Psikotik Bozukluklar, Güvenilirlik ve Geçerlilik, Ölçek, Belirti ve Bulgular.

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## INTRODUCTION

Psychotic disorders constitute a group of severe mental illnesses that typically emerge during adolescence or early adulthood, leading to profound alterations in patterns of emotion, thought, and behavior, and resulting in persistent impairments in cognitive functioning and social skills (Lewczyk, 2025). These disorders not only exert a devastating impact on the quality of life and functional capacity of affected individuals but also generate multidimensional consequences such as recurrent hospitalizations, disability, caregiver burden within families, and social exclusion (Savill et al., 2018). According to the World Health Organization, the treatment costs associated with psychotic disorders impose a substantial economic burden, accounting for approximately 7-12% of total healthcare expenditures in developed countries (Chong et al., 2016). One of the most striking aspects of this situation, bearing severe repercussions at both the individual and societal levels, is that this burden can be substantially reduced through the implementation of effective early intervention strategies. Within this context, the early identification of individuals at risk of developing psychosis and the timely initiation of appropriate interventions are of critical importance, both in terms of altering the trajectory of the illness and in mitigating the costs imposed on healthcare systems.

Epidemiological data suggest that approximately 115,000 individuals experience a first psychotic episode (FPE) annually (Lewczyk, 2025). However, these figures include only those who have received a clinical diagnosis. The literature also highlights a considerable population of individuals who, despite not meeting diagnostic criteria for a psychotic disorder, exhibit subthreshold psychotic symptoms (Savill et al., 2017). Research indicates that nearly 80–90% of individuals who later develop psychotic disorders experience a prodromal phase of varying duration, characterized by attenuated positive and negative symptoms and a decline in functioning (Yılmaz & Bora, 2018). Given their substantially elevated risk compared to the general population, such individuals are defined as the "ultra-high risk" (UHR) group (Yılmaz & Bora, 2018). The early identification of UHR individuals and their referral to appropriate healthcare services is not only crucial for preventing the onset of a first psychotic episode but also for reducing the incidence of severe psychotic disorders such as schizophrenia, which are associated with high rates of morbidity and mortality (Savill et al., 2017; Yılmaz & Bora, 2018). In this regard, several countries, including Australia, the United Kingdom, the United States, and Canada, have implemented preventive health policies that incorporate systematic screening for UHR individuals, thereby successfully reducing the risk of psychosis in this population (Orygen, 2018). Similarly, in Türkiye, the expansion of screening and monitoring programs targeting UHR individuals represents a significant opportunity for the prevention of psychotic disorders at an early stage and for the improvement of community mental health.

A key criterion for early detection is the use of measurement tools that enable rapid and practical assessment of individuals. Accordingly, early intervention programs require assessment instruments that are both easy to administer and demonstrate high levels of validity and reliability. One of the most widely used scales in Türkiye is the Positive and Negative Syndrome Scale (PANSS), a 30-item, 7-point Likert-type instrument administered via semi-structured interviews (Yılmaz & Bora, 2018). However, the administration of the PANSS can take several hours, posing practical difficulties particularly for individuals at risk for psychosis. This limitation hampers the efficiency of early screening efforts by complicating the assessment of larger populations within a short period. Another scale used in Türkiye, the Structured Interview for Psychosis-Risk Syndromes (SIPS), similarly requires semi-structured interviews (Tonyalı et al., 2022). Furthermore, validated instruments such as the Community Assessment of Psychic Experiences (CAPE), which consists of 42 items, are lengthy and time-consuming, thereby increasing the likelihood of incomplete or inaccurate responses (Sevi et al., 2019). Such limitations pose significant barriers to the timely and accurate identification of individuals within the UHR group.

In international literature, however, more practical and time-efficient instruments have been developed for the screening of psychosis risk. Within this context, the Prodromal Questionnaire (PQ) has emerged as a widely recognized tool (Savill et al., 2017). The original 92-item version was developed by Loewy et al. (2005), and a shorter, more feasible 16-item version, the Prodromal Questionnaire-16 (PQ-16), was subsequently developed by Ising et al. (2012). This abbreviated version has demonstrated strong psychometric properties, with sufficient sensitivity and specificity to accurately identify individuals at risk for psychosis (Ising et al., 2012). The PQ-16 is now widely used in international early intervention centers for the detection of individuals exhibiting prodromal symptoms. For instance, Rietdijk et al. (2012) reported that, in secondary mental health services, the PQ was approximately three times more effective than standard referral methods in detecting UHR individuals.

Taken together, these findings underscore the necessity of conducting a validity and reliability study of the PQ-16 in the Turkish context. Due to its ease of administration and high sensitivity in identifying at-risk individuals, the Prodromal Questionnaire-16 (PQ-16) holds significant potential as an effective and sustainable screening instrument in community-based psychosis risk detection and early intervention programs.

The present research investigates the validity and reliability of the Turkish adaptation of the Prodromal Questionnaire-16 (PQ-16).

## MATERIALS AND METHODS

### Study type

This study was designed as a methodological research study.

### Study group

The research was conducted between June and December 2024 with adult participants aged 18–65 years from the Turkish population.

### Study population and sample

The validity and reliability of the Prodromal Symptom Scale-16 have previously been examined across different international samples, including adolescents (Loewy et al., 2005), individuals presenting with non-psychotic psychiatric symptoms (Ising et al., 2012; Azzali et al., 2018), and community samples of individuals without a history of psychiatric disorders (Pantlin & Davalos, 2016; Shi et al., 2016). In line with these studies, the target population of the present research consisted of Turkish adults aged 18–65 years who had not received a psychiatric diagnosis. Inclusion criteria were defined as: (1) being between 18–65 years of age, (2) having no psychiatric diagnosis, (3) being literate, and (4) voluntarily consenting to participate in the study. The sample size was determined in accordance with the guidelines proposed by Comrey and Lee. According to these guidelines, a sample of 100 participants is considered "poor," 200 "fair," 300 "good," 500 "very good," and 1000 "excellent." Furthermore, for factor analysis, a minimum sample size of 300 participants has been recommended (Çokluk et al., 2014). Based on these recommendations, a minimum of 300 participants were targeted. However, as more eligible participants became available, the data collection process was completed with 500 individuals, thereby achieving a "very good" sample size.

Demographic analyses revealed that the mean age of participants was 25.53±9.39 years (range: 18-61). Among the sample, 84.4% were female, 87.3% were single, 38.4% had completed secondary education, and 77% were unemployed.

### Language and content validity

**Translation:** The scale was independently translated from English to Turkish and from Turkish to English by two bilingual experts. Both translated versions were reviewed by the research team, and the most appropriate Turkish version was determined.

**Back-translation:** To maintain precision and consistency, two independent experts who had not been involved in the initial translation process retranslated the Turkish version back into English. This back-translation was compared with the original scale, revealing only minor and insignificant differences. The comparison confirmed a high degree of semantic equivalence between the back-translated and original versions.

**Expert Review:** The Turkish version of the scale was evaluated by 10 academic experts (associate professors and professors) specializing in psychiatric nursing. Experts were asked to rate each item using a 4-point Likert-type scale (1 = Not appropriate, 2 = Needs major revision, 3 = Needs minor revision, 4 = Appropriate). No significant differences were observed across expert ratings. Based on this process, the initial Turkish version of the scale was finalized.

**Pilot Testing:** In line with recommendations in the literature (Şeker & Gençdoğan, 2006), a pilot study was conducted with 26 participants to assess the clarity and comprehensibility of the Turkish version. Findings indicated that the scale was linguistically clear and required no structural modifications. Consequently, the instrument was deemed suitable for administration in the Turkish population. Participants in the pilot study were not included in the main dataset.

### Data collection

Data were collected using a Google Forms survey, which was shared on social media to recruit volunteers. In the first section of the questionnaire, inclusion criteria were explicitly stated, and participants were asked to confirm whether they met these criteria. A warning indicated that individuals not meeting the criteria should not proceed. This section also included the informed consent form, which participants were required to read and approve. Eligible participants who provided consent were directed to the second section, where they completed the Personal Information Form and the Prodromal Questionnaire-16 (PQ-16). To prevent missing data, the survey was structured so that each item was mandatory. Furthermore, the questionnaire was configured to allow only a single submission per participant, thereby avoiding duplicate responses. In total, data from 500 participants who met the inclusion criteria and completed the survey in full were included in the analyses.

### Data collection instruments

**Information form:** This form, developed by the researchers, consisted of four questions assessing participants' age, gender, educational status, and employment status.

**Prodromal Questionnaire-16 (PQ-16):** Originally developed by Loewy et al. (2005) in a 92-item format to evaluate individuals at ultra-high risk (UHR) for psychosis, the Prodromal Questionnaire was later adapted into a shorter, 16-item version by Ising et al. (2012). The PQ-16 can be used both in clinical samples seeking help for non-psychotic disorders and in community samples of individuals not seeking mental health services (Chen et al., 2016). The PQ-16 consists of three subscales: "Perceptual abnormalities" (nine items), "Unusual thought content" (five items), and "Negative symptoms" (two items) (Ising et al., 2012). The instrument is divided into two parts. In the first part, participants respond "yes = 1" or "no = 0" to items assessing lifetime experiences of prodromal symptoms, with total scores ranging from 0 to 16. In the second part, only the items endorsed with "yes" are

rated according to the level of distress they caused, using a four-point Likert scale (0=none, 1=mild, 2=moderate, 3=severe). The total distress score can range from 0 to 48 (Ising et al., 2012). For screening purposes, individuals scoring 6 or above on the first section are considered more likely to belong to the UHR group, warranting further comprehensive clinical evaluation (Savill et al., 2018; Ising et al., 2012). The internal consistency of the original version has been reported with a Cronbach's alpha coefficient of 0.77 (Ising et al., 2012).

**Data analysis**

The data were processed using SPSS 27 and R software, with a significance threshold set at $p<0.05$. Descriptive statistics such as mean, standard deviation, and percentage values were computed. To examine content validity, Kendall's coefficient of concordance (W) was applied to measure expert agreement. The adequacy of the sample for factor analysis was evaluated through the Kaiser-Meyer-Olkin (KMO) test and Bartlett's test of sphericity. Construct validity was assessed via Confirmatory Factor Analysis (CFA). Internal validity was checked using the 27% upper-lower group method, while reliability was determined with Cronbach's alpha and the split-half method.

**Ethical considerations**

This research adhered to the ethical standards outlined in the Declaration of Helsinki. Authorization to employ the Prodromal Questionnaire-16 (PQ-16) was secured through email correspondence with its original author. The Ethics Committee of Bartın University approved the study on May 30, 2024 (Approval No: 2024-SBB-0453). Before taking part, participants were clearly informed about the objectives and procedures, and their written consent was collected.

## RESULTS

**Validity Analyses**

Data suitability for factor analysis was assessed using the Kaiser-Meyer-Olkin (KMO) test and Bartlett's test of sphericity. The KMO value was found to be 0.86, and Bartlett's test yielded $\chi^2=1316.602$, $p<0.001$, indicating adequacy for factor analysis. Results of the Exploratory Factor Analysis (EFA) revealed three factors with eigenvalues greater than 1. The first factor included nine items, the second factor five items, and the third factor two items. Together, the three-factor structure explained 41.85% of the total variance. Factor loadings for the 16 items varied between 0.31 and 0.59 (Table 1).

**Table 1. Factor structure, eigenvalues, and explained variance of the PQ-16 scale.**

| Items | Perceptual Abnormalities | Unusual Thought Content | Negative Symptoms |
|---|---|---|---|
| **S3** | 0.499 | | |
| **S4** | 0.441 | | |
| **S5** | 0.445 | | |
| **S6** | 0.447 | | |
| **S8** | 0.307 | | |
| **S9** | 0.597 | | |
| **S11** | 0.576 | | |
| **S12** | 0.558 | | |
| **S13** | 0.398 | | |
| **S2** | | 0.343 | |
| **S10** | | 0.478 | |
| **S14** | | 0.481 | |
| **S15** | | 0.487 | |
| **S16** | | 0.455 | |
| **S1** | | | 0.378 |
| **S7** | | | 0.330 |
| **Eigenvalue** | 4.158 | 1.293 | 1.054 |
| **Explained Variance (%)** | 25.989 | 34.871 | 41.859 |
| **KMO** | | | 0.866 |
| **Bartlett's Test** | | | 1316.602 |
| **p** | | | 0.000 |

KMO= Kaiser Meyer Olkin

The three-factor structure of the PQ-16 was further examined through second-order multifactor Confirmatory Factor Analysis (CFA). Fit indices indicated an acceptable model fit: $\chi^2=245.301$; df=101; $\chi^2/df=2.428$; p=0.000; RMSEA=0.053. Additional fit indices, including NFI, NNFI, CFI, IFI, RFI, SRMR, GFI, and AGFI, were also within acceptable to good fit thresholds ($p<0.001$). The factors in the CFA ranged between 0.31 and 0.58 (Figure 1; Table 2).

The internal validity of the scale was evaluated using the 27% upper-lower group comparison method. Independent samples t-tests indicated significant differences between the mean scores of the upper

group (participants with the highest prodromal symptom levels) and the lower group (participants with the lowest prodromal symptom levels), confirming internal validity (t=-35.977; p<0.001) (Table 3).

**Table 2. Confirmatory factor analysis fit indices for the PQ-16 scale.**

| Fit Indices | Good Fit | Acceptable Fit | Model Result | Fit |
|---|---|---|---|---|
| **RMSEA** | 0<RMSEA<0.05 | 0.05≤RMSEA≤0.10 | 0.053 | Acceptable |
| **NFI** | 0.95≤NFI≤1 | 0.90≤NFI≤0.95 | 0.916 | Acceptable |
| **NNFI** | 0.97≤NNFI≤1 | 0.95≤NNFI≤0.97 | 0.959 | Acceptable |
| **CFI** | 0.97≤CFI≤1 | 0.95≤CFI≤0.97 | 0.951 | Acceptable |
| **IFI** | 0.95≤IFI≤1 | 0.90≤IFI≤0.95 | 0.903 | Acceptable |
| **RFI** | 0.90≤RFI≤1 | 0.85≤RFI≤0.90 | 0.882 | Acceptable |
| **SRMR** | 0≤SRMR≤0.05 | 0.05≤SRMR≤0.10 | 0.048 | Good Fit |
| **GFI** | 0.95≤GFI≤1 | 0.90≤GFI≤0.95 | 0.940 | Acceptable |
| **AGFI** | 0.90≤AGFI≤1 | 0.85≤AGFI≤0.90 | 0.919 | Good Fit |
| **$\chi^2$/df** | 0≤$\chi^2$/df≤3 | 3≤$\chi^2$/df≤5 | 2.428 | Good Fit |

**Table 3. Item discrimination analysis for the PQ-16 scale.**

| Group | n | Mean | SD | t | p |
|---|---|---|---|---|---|
| **Lower group** | 135 | 0.40 | 0.49 | -35.977 | 0.000 |
| **Upper group** | | 7.71 | 2.31 | | |

SD= Standard deviation

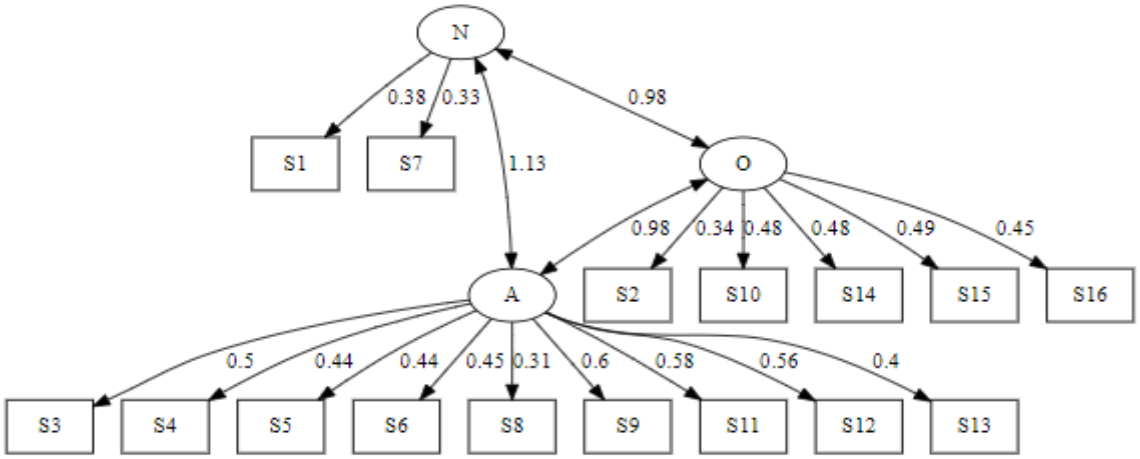


**Figure 1. Confirmatory factor analysis diagram of the PQ-16 Scale.**

**Reliability Analyses**

Reliability of the PQ-16 was evaluated using Cronbach's alpha and the split-half method. Cronbach's alpha was calculated as 0.797, and the Guttman split-half coefficient as 0.785. The first half of the scale (first eight items) yielded a Cronbach's alpha of 0.673, whereas the second half (last eight items) yielded 0.735. The correlation coefficient between the two halves was 0.659. Item-total correlation coefficients ranged from 0.302 to 0.535 (Table 4).

**Table 4. Reliability analysis results of the PQ-16 scale.**

| Sub-dimensions of the Scale | Scale Items | Item-Total Correlation | Cronbach's Alpha if Item Deleted | Cronbach's Alpha |
|---|---|---|---|---|
| **Perceptual Abnormalities** | S3 | 0.442 | 0.783 | |
| | S4 | 0.392 | 0.787 | |
| | S5 | 0.403 | 0.786 | |
| | S6 | 0.405 | 0.788 | |
| | S8 | 0.302 | 0.795 | |
| | S9 | 0.535 | 0.775 | |
| | S11 | 0.516 | 0.776 | |
| | S12 | 0.497 | 0.778 | |
| | S13 | 0.345 | 0.791 | 0.72 |
| **Unusual Thought Content** | S2 | 0.312 | 0.795 | |
| | S10 | 0.412 | 0.786 | |
| | S14 | 0.421 | 0.786 | |
| | S15 | 0.419 | 0.786 | |
| | S16 | 0.394 | 0.787 | 0.62 |
| **Negative Symptoms** | S1 | 0.363 | 0.791 | |
| | S7 | 0.329 | 0.792 | 0.51 |
| **PQ-16 Total** | | **Cronbach's Alpha** | | 0.797 |
| | | **Guttman Split-Half** | | 0.785 |

**Table 5. Correlations between PQ-16 subscales and total score.**

| Subscales | Mean | SD | Skewness | Kurtosis | F1 | F2 | F3 |
|---|---|---|---|---|---|---|---|
| **F1. Perceptual Abnormalities** | 1.91 | 1.90 | 1.041 | 0.764 | 1 | | |
| **F2. Unusual Thought Content** | 0.94 | 1.07 | 1.322 | 1.647 | 0.613** | 1 | |
| **F3. Negative Symptoms** | 0.73 | 0.71 | 0.439 | -0.946 | 0.457** | 0.364** | 1 |
| **PQ-16 Total** | 3.59 | 3.10 | 1.039 | 1.003 | 0.933** | 0.808** | 0.637** |

SD= Standard deviation; *p<0.05; **p<0.001

Correlation analysis between subscales indicated that the dimensions of the scale function as internally related components of the same construct with associations ranging from weak (r=0.364) to very strong (r= 0.933) (p < 0.001) (Table 5). For test-retest analysis, the scale was administered again to 32 participants after one month. The test-retest analysis yielded a correlation of r=0.922 (p<0.001), indicating a very strong, positive, and statistically significant relationship between the two administrations (Table 6).

**Table 6. Test-retest reliability analysis of the PQ-16 scale.**

| | Mean±SD | Min–Max |
|---|---|---|
| First Assessment (n=500) | 3.59±3.10 | 0–16 |
| Second Assessment (n=32) | 3.08±3.42 | 0–16 |
| Test-Retest Correlation | r=0.922* | |

SD= Standard deviation; *p < .001

## DISCUSSION

Considering the severe psychotic symptoms and profound functional impairments caused by psychosis, the importance of early intervention in psychotic disorders becomes evident. This necessity further underscores the demand for valid and reliable measurement tools capable of detecting prodromal symptoms at an early stage. In early intervention centers in countries such as Australia, the United Kingdom, and the United States, the Prodromal Questionnaire (PQ) is widely employed to assess psychosis risk symptoms (Orygen, 2018; Savill et al., 2018). Particularly, the short form with 16 items, the PQ-16, is frequently preferred due to its ease of administration and time efficiency (Savill et al., 2018).

In this research, the psychometric evaluation of the Turkish PQ-16 was carried out using both Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA). EFA, as a multivariate technique, is widely employed in developing and validating theoretical constructs and measurement tools (Watkins, 2018). To determine whether the sample was appropriate for factor analysis, the Kaiser-Meyer-Olkin (KMO) statistic was calculated. According to established benchmarks, KMO scores of 0.90-1.00 indicate excellent adequacy, 0.80-0.89 very good, 0.70-0.79 good, 0.60-0.69 moderate, 0.50-0.59 poor, and below 0.50 unacceptable (Yaşlıoğlu et al., 2017). In this study, a KMO value of 0.86 showed that the data were very well suited for factor analysis. Bartlett's sphericity test was also significant ($p<0.001$), further confirming the appropriateness of the dataset (Yaşlıoğlu et al., 2017; Watkins, 2018).

The factor structure of the scale revealed a three-factor solution, with nine items in the first subscale, five in the second, and two in the third. These three factors accounted for 41.85% of the total variance. In the literature, an explained variance exceeding 40% is generally considered acceptable for construct validity (Baştürk et al., 2013). Thus, the findings of this study support the adequacy of the factor structure of the PQ-16. Previous cross-cultural validation studies have reported diverse factor structures, including unidimensional (Parabiaghi et al., 2024), two-factor (Howie et al., 2023), three-factor (Chen et al., 2016; Ising et al., 2012; Savill et al., 2018), and four-factor (Levey et al., 2018) models. Nevertheless, in most studies, the PQ-16 has been evaluated primarily based on the total score rather than its subscales (Parabiaghi et al., 2024; Savill et al., 2018). This suggests that, particularly in screening contexts, the overall score of the scale serves as a more decisive indicator for clinical decision-making (Savill et al., 2018).

The CFA results further confirmed the three-factor structure, with a $\chi^2/df$ ratio of 2.428, demonstrating good model fit. Moreover, fit indices such as CFI, GFI, AGFI, and NFI were all above the threshold of 0.90, indicating statistical support for the model's validity. The RMSEA value of 0.053 also fell within acceptable error margin. These findings are consistent with the fit indices suggested in the literature (Gürbüz & Şahin, 2015). The results are also in line with prior validation studies conducted in different cultural contexts (Ising et al., 2012; Levey et al., 2018; Howie et al., 2023), reinforcing the validity of the PQ-16 as a psychometric instrument. Within the three-factor model identified in this study, factor loadings ranged from 0.31 to 0.59, with all items exceeding the commonly accepted minimum threshold of 0.30. Although it is generally recommended that factors include at least three items, previous literature has highlighted that two-item subscales can also demonstrate adequate internal consistency and usability in certain contexts (Worthington & Whittaker, 2006). Given that the PQ-16 is most often interpreted based on its total score (Ising et al., 2012; Levey et al., 2018; Howie et al., 2023), the inclusion of the two-item subscale is both theoretically justified and consistent with prior research. Therefore, no items were excluded, and the three-factor structure of the Turkish version of the PQ-16 was accepted as valid. For practical applications, the total score is recommended as the primary outcome measure. The internal validity of the scale was further supported by the 27% upper-lower group comparison, which demonstrated significant differences between participants with high versus low levels of prodromal symptoms. This finding indicates that the PQ-16 possesses sufficient discriminative power to differentiate between varying levels of symptom severity.

Reliability is a fundamental psychometric property that reflects the stability and consistency of a measurement tool across time and conditions (Şencan, 2005). A reliable scale should produce consistent results when administered repeatedly under similar circumstances and should demonstrate coherence among items designed to measure the same construct (Çapık, 2014). Among the most widely used indicators of internal consistency is Cronbach's alpha coefficient, with values approaching 1.0 reflecting greater consistency (Şencan, 2005). Values below 0.60, on the other hand, indicate questionable reliability (Çapık, 2014). Ising et al. (2012) reported a Cronbach's alpha of 0.77 for the PQ-16 in their original validation. In a Dutch adolescent sample, de Jong et al. (2016) found a reliability coefficient of 0.84. Research from China (Chen et al., 2016) and Italy (Azzali et al., 2018) also demonstrated acceptable reliability, with alpha values of 0.75 and 0.81, respectively. In the present Turkish adaptation, the Cronbach's alpha of 0.80 demonstrates that the PQ-16 possesses adequate internal consistency for assessing prodromal symptoms, performing comparably to, and in some cases exceeding, results obtained in other cultural contexts. This finding supports the scale's reliability in the Turkish population and highlights its cross-cultural applicability as a consistent measurement tool.

One of the commonly employed methods for assessing the consistency of scale scores is the split-half reliability test (Tavşancıl, 2019). This method evaluates the correlation between scores obtained from two equivalent halves of a scale, providing an estimate of overall reliability (Gürbüz & Şahin, 2015). In this study, Guttman's split-half coefficient was calculated to determine split-half reliability. In the literature, values of 0.70 and above are considered good (Kline, 2011). In this context, the split-half coefficient of 0.78 obtained for the PQ-16 demonstrates high reliability. Furthermore, correlations among subscales indicate that the dimensions of the scale are internally coherent and operate as related components of the same construct.

Test-retest reliability is another essential method for assessing the temporal stability of a measurement instrument. This approach examines the correlation between scores obtained from the same individuals at different time points, thereby determining the scale's stability over time (Çapık, 2014). High correlations between administrations indicate that the instrument consistently reflects the construct it is designed to measure. In the literature, a coefficient of 0.70 or higher is generally considered strong evidence of test–retest reliability (Gürbüz & Şahin, 2015). In this study, the correlation coefficient between the two administrations of the PQ-16 was 0.92, indicating a very high level of temporal stability and strong test–retest reliability.

Taken together, these findings suggest that the PQ-16 demonstrates sufficient psychometric properties in terms of validity and reliability. The results of both exploratory and confirmatory factor analyses confirmed a theoretically consistent factorial structure. A high Cronbach's alpha coefficient supported the internal consistency of the scale, while the 27% upper-lower group comparisons provided evidence for its discriminative capacity. Moreover, the strong correlations obtained through test–retest and split-half analyses confirm that the PQ-16 is a stable and reliable measurement tool over time. Therefore, the PQ-16 could be considered a valid and reliable instrument for assessing prodromal symptoms. Its psychometric strength supports its use in both clinical practice and research settings.

**Study limitations and strengths**

The study is subject to some limitations; notably, the cross-sectional nature of the data collection prevented examination of the scale's long-term stability. Second, one of the subscales consisted of only two items, which may raise structural concerns; however, since previous studies have primarily utilized the total score for evaluation, this structure was deemed acceptable. Third, reliance on self-report measures may have introduced response bias. The demographic composition of the sample limits generalizability, as participants were predominantly female, younger, and unemployed; therefore, the findings should be interpreted cautiously when applied to populations with different gender, age, or socioeconomic profiles. Future research should aim to recruit more demographically balanced and diverse samples to further evaluate the psychometric properties of the PQ-16 across different groups. Taken together, these limitations highlight the need for subsequent studies to employ longitudinal designs, include varied samples, and conduct criterion validity analyses to strengthen the evidence base for the scale.

## CONCLUSION

The Turkish version of the PQ-16 demonstrated adequate psychometric properties in terms of validity and reliability, establishing its utility as a practical screening tool for mental health professionals. Its brevity, clarity, and ease of administration make it especially valuable for the rapid identification of individuals at risk for psychosis, facilitating timely evaluation and referral without unnecessary delays. The scale can serve as an effective pre-assessment tool in settings such as community mental health centers, school counseling services, and primary healthcare facilities, thereby supporting early detection efforts. In this respect, the PQ-16 provides mental health professionals with a time- and resource-efficient, evidence-based instrument. Future research should aim to validate the scale across diverse populations, including adolescents, clinical outpatients with psychiatric diagnoses, older adults, and pregnant women. Expanding the evidence base across different clinical and community contexts, alongside the development of comprehensive guidelines for practitioners, will enhance the applicability and sustainability of the PQ-16 as a robust tool for early detection of psychosis risk.

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**Conflict of Interest**

The authors declare no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

**Author Contributions**

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**Ethical Approval**

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