

Evaluation of the Psychometric Properties of Scales to Measure Student Satisfaction Used as Indicators of Service Quality in Higher Education in Türkiye

Türkiye’de Yükseköğretimde Hizmet Kalitesinin Göstergesi Olarak Kullanılan Öğrenci Memnuniyeti Ölçeklerinin Psikometrik Özelliklerinin Değerlendirilmesi

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Özet

Yükseköğretimde kalitenin bir göstergesi olan öğrenci memnuniyeti ölçümleri, 2015 yılından bu yana üniversitelerin stratejik planlamasında ve kalite değerlendirmesinde önemli bir veri kaynağı olmuştur. Üniversitelerin iç değerlendirme raporlarına bakıldığında her üniversitenin genellikle kendi anketini yapılandığı ve bu anketlere dayanarak memnuniyet oranlarını raporladıkları görülmektedir. Literatürde, yükseköğretimde öğrenci memnuniyetini ölçmeye yönelik geçerliliği ve güvenilirliği kanıtlanmış ölçekler yer almakta olup bu ölçeklerin anketlere tercih edilmesi gerekmektedir. Ancak bu geçerlik ve güvenilirlik çalışmaları değerlendirildiğinde, çoğunun örneklemden değil de çalışma grubundan elde edilen sonuçlara bağlı olduğu görülmüştür. Ayrıca bu çalışmalar sadece klasik test teorisi çerçevesinde tanımlanan temel metodolojik özellikleri test etmişlerdir. Bu çalışmanın amacı, Türkiye’deki yükseköğretim kurumlarında öğrenci memnuniyetini ölçmek için geliştirilen ölçeklerin bir ölçeğin sahip olması gereken psikometrik özellikleri sağlayıp sağlamadığını sorgulamaktır. Bu amaçla literatür, özel arama motorlarında zaman kısıtlaması olmaksızın belirli filtrelerle taranmıştır. Başlık/özette “öğrenci(ler)in memnuniyet ölçeği”, “geçerlilik”, “güvenilirlik” konularını içeren toplam 147 çalışma elde edilmiştir. Bu çalışma için araştırmacılar tarafından oluşturulan kontrol listesinde geçerlilik, ölçüm hatası, güvenilirlik, yanıt verebilirlik, kültürler arası geçerlilik ve yorumlanabilirlik başlıkları altında toplam 23 alt başlık yer almıştır. 147 makale içerisinde 32 tanesi bu çalışmaya dahil edilme kriterleri göz önünde bulundurularak seçilmiş ve bu spesifik kontrol listesi kullanılarak seçilen makalelerin psikometrik özellikleri incelenmiştir.

Anahtar Sözcükler: Geçerlilik, Güvenilirlik, Öğrenci Memnuniyet Ölçeği, Yükseköğretim

Abstract

Student satisfaction measures as quality indicators in higher education have been an important source of data in the strategic planning and quality assessment of universities since 2015. Upon examination of the internal evaluation reports of various universities, it becomes evident that each institution typically develops its own questionnaire and subsequently reports the proportion of satisfaction based on the responses obtained through this instrument. The literature contains proven, reliable scales for measuring student satisfaction in higher education, which are superior to questionnaires. However, when these validity and reliability studies were evaluated, it was seen that most of them depended on the results obtained from the study group, not from the sample. They only tested the basic methodological features defined in the framework of classical test theory. The aim of this study is to question whether the scales developed to measure student satisfaction in higher education institutions in Türkiye provide the psychometric properties that a scale should have. For this purpose, the literature was searched with specific filters in specific search engines without time constraints. A total of 121 studies, which included “student(s) satisfaction scale”, “validity”, “reliability” in the title/abstract were obtained. A check list, created by the researchers for this study, included a total of 23 sub-titles under the headings of validity, measurement error, reliability, responsiveness, cross-cultural validity and interpretability. Within 121 articles, 32 were selected by considering the inclusion criteria for this study and their psychometric properties were examined by using this specific check list.

Keywords: Reliability, Validity, Student Satisfaction Scale, Higher Education

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Student satisfaction is related to providing the emotional, academic and social needs of students. Student satisfaction is measured in educational institutions; it is a result of how students perceive educational experiences and outcomes (Oliver and DeSarbo, 1989). Franklin and Shemwell (1995) defined student satisfaction as the difference between individual expectations about the outcome of the process and the reality perceived by the individual before experiencing the educational experience and stated that students' satisfaction and their needs and expectations for educational programs would contribute to their social and cognitive progress.

Oliver (1999) takes attention to satisfaction, which is one of the concepts that universities should focus on while structuring their understanding of education. Universities should strive to maximize student satisfaction by seeing their students as the key stakeholders of higher education and giving importance to their opinions while aiming for success (Harvey et al., 1997). Student satisfaction is important to educational institutions and researchers because this feedback can be used to assess the quality of education, meet students' needs, and improve educational processes. As the level of meeting student expectations and satisfaction in educational services of universities increases, the preference level of universities and higher education institutions increases accordingly (Kaynar et al., 2006).

Researchers often design and conduct studies to improve the educational experience or assess the effectiveness of specific teaching methods or interventions. By measuring student satisfaction, researchers can gauge whether their efforts achieve the desired outcomes. If students are satisfied with their learning experiences, it suggests that the interventions or approaches being studied are effective and beneficial.

Student satisfaction can serve as a measure of teaching effectiveness. When students are satisfied with their instructors, it indicates that the educators' teaching methods, communication, and support are meeting their needs. Positive student satisfaction ratings can provide evidence of effective teaching practices, helping researchers identify and promote strategies that contribute to better educational outcomes.

Researchers may seek to understand the factors influencing student satisfaction and use this knowledge to design interventions that increase student engagement and motivation. By assessing student satisfaction, researchers gain insights into areas that need improvement, identify gaps in the educational experience, and pinpoint specific challenges faced by students. This information can guide the development of new initiatives, policies, or interventions to address these areas of improvement and create a more positive and effective learning environment.

While measuring student, academic, and administrative staff satisfaction in Turkish Universities was seen as a research preference before 2015, it has been used as an important data source for strategic planning and quality assessment after this date. Within the framework of the Institutional External Evaluation Program of the Higher Education Quality Board, the satisfaction questionnaire results presented in the internal evaluation reports of higher education institutions are especially questioned. While evaluating the satisfaction of stakeholders in institutions, questionnaires structured by the institution's quality board are generally used. The validity and reliability of most of these questionnaires were not examined. Even if institutions use their own questionnaires to measure satisfaction, in literature there are satisfaction scales with proven validity and reliability (Baykal et al., 2002; Şimşek et al., 2019). The fact that universities measure satisfaction with different measurement tools causes bias in both the evaluation of the institution by years and the comparison of institutions in terms of satisfaction ratios. This research was designed to answer the question of whether student satisfaction, which is one of the basic measurements in the quality standards of institutions, is measured with valid and reliable tools.

When developing a scale, researchers often focus on just generating questions. However, if the latent dimension that the scale aims to measure cannot be accurately measured, this scale cannot be evaluated differently from questionnaire. Some studies created a list of psychometric properties that any scale must have in order to measure this latent dimension. The most comprehensive checklist that lists the psychometric properties of scales developed in the field of health is the **C**onsensus-based **S**tandards for the selection of health **M**easurement **I**nstruments (COSMIN) checklist (Mokkink et al., 2010). Studies evaluating the measurement properties of an instrument should be of high methodological quality to guarantee appropriate conclusions about the measurement properties of the instrument. To evaluate the methodological quality of a study on measurement properties, standards are needed for design requirements and preferred statistical analyses. The COSMIN group developed a checklist containing such standards. This checklist can be used to evaluate the methodological quality of studies on measurement properties. Although this list may seem specific to the field of health, it can also be used to evaluate the quality of a scale developed in any field.

In this study, we have prepared a more concise check-list from COSMIN and evaluated the student satisfaction scales developed in Türkiye according to this check-list prepared for this study. In addition, because of the effect of sample size and target population on the scale generalizability, they were added as criteria to this check list. The sample population to which the scale was applied. In order to measure the satisfaction of all students in Türkiye without distinction of departments with any scale, the sample which is selected to develop the scale should represent the whole of Türkiye.



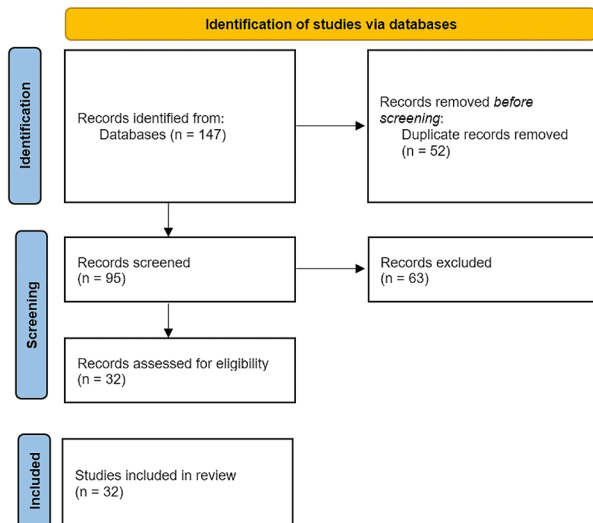
Method

This systematic review set out to identify the student satisfaction scales that have been developed in Türkiye, and to systematically catalogue their psychometric properties, and to present some evidence about the validity and reliability of these scales. Reliability refers to the consistency, stability, and precision of the measurements obtained from a scale. Validity refers to the extent to which a scale accurately measures the construct or concept it is intended to measure. Both reliability and validity are essential for ensuring that the measurements obtained from a scale are meaningful and accurate.

Search strategy

The literature was searched with specific filters in PubMed, Scopus, Science Direct, Google Scholar, National Thesis Center search engines without time constraints. For each search engine, filters suitable for the purpose of the study were created. The search filter example for PUBMED is (“*Student Satisfaction*”[Title/Abstract]) AND (((*Türkiye*[Title/Abstract] OR *Turkish*[Title/Abstract]) OR “*Turkish population*”[Title/Abstract]) OR “*Turkish sample*”[Title/Abstract]) OR “*Turkish form*”[Title/Abstract]) AND (Reliability[Title/Abstract] OR Validity[Title/Abstract]).

■ **Figure 1.**
Flow chart of the study.



Selecting articles

For the first search, all papers including student satisfaction scale were identified from each search engine. Then duplicate articles were extracted and obtained from the first search. After getting potential papers with a candidate student satisfaction then they were screened by all authors. The titles and abstracts were scanned manually to identify the valid-discard articles that serve the study aim. While selecting valid articles among the

obtained by systematic search, it was paying attention that the relevant article was a study in which the validity and reliability of the student satisfaction scales directly or under service quality were conducted. The studies that used the student satisfaction scales but did not deal with any validity or reliability measure were discarded. For example, if any article used an existing student satisfaction scale in its method and examined the correlation between the results obtained from this scale and the manifest variables, this article was discarded.

Check list items

Validity (content, construct, criterion), measurement error, reliability (internal consistency, test-retest reliability, intra-class correlation coefficient), responsiveness (effect size, standardized response mean, Area Under Receiver Operating Characteristic Curve, sensitivity, specificity), Cross-cultural validity (confirmatory factor analysis, differential item functioning), interpretability (minimal important change, minimal important difference), target population of scale, sample size, number of items, response type were selected as criteria's for check list. The purpose of this study is not to evaluate the methodological quality of student satisfaction scales in the literature and to rank them from best to worst; it is to profile only the psychometric properties evaluated in these scales. Therefore, each article was evaluated by questioning whether it met the defined criteria; the total score was not calculated.

Findings

The search identified 147 abstracts related to potential student satisfaction. After excluding 52 duplicates, 95 unique papers that satisfied the selection criteria were remained. The full texts of all of these articles were obtained. Then 63 of these were discarded because these studies used the student satisfaction scales but did not deal with any validity or reliability measure. Finally, 32 article which conducted validity and reliability of the student satisfaction directly or under service quality were defined as valid (Aslan and Öztürk, 2020; Ataman and Adıgüzel, 2019; Baykal et al.2011; Baykal et al.,2002; Bayrak, 2007; Bektaş and Ulutürk, 2013; Çinkır et al., 2019; Çomaklı, 2015; Demirdağ, 2017; Demirli and Kerimgil, 2009; Ekinci and Burgaz, 2007; Erden, 2015; Erdoğan and Uşak, 2005; Gökulu, 2020; Günaydın and Dalkıran, 2020; Haliloğlu et al., 2011; İçli and Anıl, 2014; Karadağ and Yücel, 2020; Olcay and Ay, 2019; Şahin, 2009; Şen, 2013; Şimşek et al. 2019; Tatar et al., 2017; Tayyar and Dilşeker, 2012; Tütüncü and İpekgil, 2003; Yavuz, 2020; Yavuz and Akman, 2018; Yıldız and Karar, 2009; Yılmaz, 2019; Yılmaz and Çokluk, 2006; Zineldin et al., 2011) (■ Fig. 1). All 32 articles were reviewed and a prepared check list was filled to ascertain the psychometric evidence. The Summary results of this psychometric evaluation are given at ■ Table 1.

Table 1.

Summary of overall psychometric evaluation for 32 articles.

Validity	No evidence	Absent	Present
Content	4 (%12)	12 (%38)	16 (%50)
Internal construct validity		2 (%6)	30 (%94)
External construct validity		31 (%97)	1 (%3)
Criterion validity		25 (%78)	7 (%22)
Measurement Error	No evidence	Absent	Present
Standard Error of Measurement		32 (%100)	0 (%0)
Smallest Detectable Change		32 (%100)	0 (%0)
Limits of Agreement		32 (%100)	0 (%0)
Reliability	No evidence	Absent	Present
Internal consistency	1 (%3)	1 (%3)	30 (%94)
Test-retest reliability (Pearson correlation)		29 (%91)	3 (%9)
Intra-class correlation coefficient		32 (%100)	0 (%0)
Responsiveness	No evidence	Absent	Present
Effect size		32 (%100)	0 (%0)
Standardized response mean		32 (%100)	0 (%0)
Area under Receiver Operating Characteristic Curve		32 (%100)	0 (%0)
Sensitivity/Specificity		32 (%100)	0 (%0)
Cross-cultural validity	No evidence	Absent	Present
Confirmatory factor analysis		22 (%69)	10 (%31)
Differential item functioning		32 (%100)	0 (%0)
Interpretability	No evidence	Absent	Present
Minimal important change		32 (%100)	0 (%0)
Minimal important difference		32 (%100)	0 (%0)

Considering the target population of the study, which is one of the factors affecting the reliability of the scale, a study group was used instead of the sample representing the population in all studies. No sample selection was carried out from the population using the convenient sampling methodology. At used 32 articles, median (min-max) size of study groups was 482 (112-39368). The Median (min-max) number of items of the scale was 36 (3-113). When the response types of items are evaluated, item response type was not reported in 1 article (3%); 5-point Likert response type was used in 26 articles (81%); 7-point Likert response type was used in 4 articles (13%), and 10-point likert response type was used in one article (3%). It can be said that the most used item response type is 5-point likert.

From Table 1, it is seen that content validity was examined in only half of the studies. Internal construct validity was questioned in 94% of the studies. On the contrary, it is seen that the external construct validity was not questioned in 97% of the studies. Criterion validity was not evaluated for 78% of these articles. Measurement error, responsiveness, interpretability and differential item functioning were not questioned in any of these 32 articles. For internal consistency, 94% of articles had given

Cronbach-alpha coefficient. Test-retest was questioned in only 3(9%) studies, and this query was also made with correlation analysis. However, the test-retest should be examined with an intra-class correlation coefficient, not with correlation analysis, because of the measurement theory rule. But none of the studies calculated the intra-class correlation coefficient while evaluating the test-retest.

In 32 articles, 10 (31%) of them performed confirmatory factor analysis (CFA). The reason for using CFA in these studies was to increase the validity of the scale rather than to evaluate the real cross-cultural validity. Therefore, the CFA failed to serve the right purpose. Exploratory factor analysis was also performed in all studies that used CFA.

Conclusions

It is thought that improving the quality of education depends on striving for continuous improvement, focusing on stakeholder interests and increasing student satisfaction. In this context, it is important for institutions to measure satisfaction with the service provided by higher education institutions. Today, satisfaction, which is an indicator of service quality, must be evaluated correctly in order to survive



in the intense competition environment between more than 200 higher education institutions, to increase national or international recognition, and to provide quality service that will satisfy customers. In this study, psychometric properties of scales developed to measure student satisfaction in higher education institutions in Türkiye were evaluated. When we look at the methodological studies aiming to measure student satisfaction, it was seen that the existing student satisfaction scales were not developed on a sample reflecting the general population and the psychometric properties of the scales were not questioned in detail. In addition, it was observed that classical test theory was used in all scales when questioning the internal construct validity. Using the item response theory or advanced methodologies for scale development will enable questioning causality and examining the response behaviors of the respondents. A student satisfaction scale to be implemented throughout Türkiye should be developed with a methodology that questions the item functioning differences according to the qualifications of the universities (engineering, medicine, etc.). In addition, there is a need for interpretability statistics that show whether the increase or decrease in student satisfaction is significant compared to the previous year for internal evaluations. It was observed that differential item functioning was not questioned in any of the reviewed articles. Questioning the change in students' satisfaction levels according to their grade level, gender, socio-economic level...etc. can enable administrators to better understand the points where satisfaction is not achieved and produce solutions.

The fact that institutions that evaluate student satisfaction with a questionnaire obtain the satisfaction rate by a single general question is insufficient to determine the degree of satisfaction. If a satisfaction scale with proven validity and reliability has a cut-off point for the total score that can divide the participants into two groups as "satisfied/not satisfied", it will enable the institution to measure the student satisfaction rate more precisely. However, in none of the studies examined, there was no evidence questioning the cut-off point of the scale and the accuracy of this cut-off point. In all articles questioning test-retest reliability of scales, an appropriate statistical methodology was not used. Considering the articles examined in the study, it is seen that especially the internal validity and internal consistency are evaluated, but the examination of other validity-reliability criteria is ignored. All these need advance statistics perspectives.

In this study, we aimed to evaluate the psychometric properties of student satisfaction scales developed for the Turkish population. Without rating the psychometric quality of the scales, we descriptively presented the psychometric properties of the scales examined in these articles. This review was conducted using specific search engines and specific search filters. Therefore, different results can be obtained using different search engines. Data

were gathered from publications in a systematic manner using forms we designed that included all the psychometric measures included in the COSMIN checklist. Errors in data extraction were avoided by all authors carrying out the procedure independently and resolving any inconsistencies through discussion. However, results may differ depending on the perspectives of different evaluators.

In conclusion, since this is the first systematic review study covering all student satisfaction scales developed for the Turkish population, our findings cannot be directly compared to those of previous studies on the subject. However, this study will be an important resource for methodological studies on student satisfaction. As a result, there is a need for student satisfaction scales to be developed with more detailed methodologies based on population-based samples, which will ensure the comparability of universities in terms of student satisfaction as a quality indicator in higher education institutions in Türkiye.

Yazar Katkıları / Author Contributions: SY: Fikir, tasarım, kaynak taraması, makalelerin taranması, kontrol listesinin doldurulması, bulguların yorumlanması; PD: tasarım, kaynak taraması, makalelerin taranması, kontrol listesinin doldurulması, bulguların yorumlanması; AA: tasarım, kaynak taraması, makalelerin taranması, kontrol listesinin doldurulması, bulguların yorumlanması; MS: kontrol listesinin doldurulması. / *SY: Idea, design, literature review, article scanning, checklist filling, interpretation of findings; PD: Design, literature review, article scanning, checklist filling, interpretation of findings; AA: Design, literature review, article scanning, checklist filling, interpretation of findings; MS: checklist filling.*

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-Bu çalışmada etik kurul raporu gerekmemiştir.
-*Ethics committee report was not required for this study.*

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