Cukurova Medical Journal
ÇUKUROVA ÜNİVERSİTESİ TIP FAKÜLTESİ

Cukurova Med J 2019;44(3):1055-1063
DOI: 10.17826/cumj.482420

ARAŞTIRMA / RESEARCH

Patient Health Engagement Scale (PHE-s): Validity and reliability for Turkish patients with chronic diseases

Hasta Katılımı Ölçeği: Kronik hastalığı olan hastalarda Türkçe geçerlik ve güvenirlik çalışması

Dilara Usta[1], Fatoş Korkmaz[1], İmatullah Akyar[2], Andrea Bonanomi[3]

[1]Hacettepe University, Faculty of Nursing, Department of Fundamentals of Nursing, [2]Department of Internal Medicine Nursing, Ankara, Turkey
[3]Università Cattolica del Sacro Cuore, Department of Statistical Sciences, Milan, Italy

Cukurova Medical Journal 2019;44(3):1055-1063.

Abstract

Purpose: Engaging patients in their health care management journey has emerged as the requirement of the patient-centered care. Considering as an evidence-based measure, The Patient Health Engagement Scale was developed to evaluate patients' emotional, behavioral, and cognitive competences during their care. This study aimed to assess the psychometric properties of PHE-s in Turkish patients with chronic diseases.

Materials and Methods: In this methodological study, one hundred and fourteen inpatients with chronic diseases were recruited in June 2018 in a university hospital. Content validity and reliability analysis were conducted. The original scale was translated into Turkish and back into English.

Results: The Ordinal alpha was found 0.80, which refers to a good internal consistency. The Rasch analysis demonstrated that the scale is unidimensional. The inter-item polychoric correlation coefficient was equal to 0.61 and every factor loadings in the Categorical Principal Component Analysis were higher than 0.74.

Conclusion: Taking into consideration, The Turkish version of the Patient Health Engagement Scale has good psychometric properties for evaluating the patient engagement phases and can be used by the Turkish-speaking community.

Keywords: chronic disease, nursing, patient engagement, psychometric properties

Öz

Amaç: Hastaları sağlık bakım yönetimine dahil etmek, hasta merkezli bakımın bir gerekliliği olarak ortaya çıkmıştır. Hasta Katılımı Ölçeği, hastaların bakımları süresince duygusal, davranışsal ve bilişsel yeterliliklerini değerlendirmek üzere geliştirilmiştir. Bu çalışmanın amacı, kronik hastalığı olan bireylerde, Hasta Katılımı Ölçeği'nin Türkçe formunun psikometrik özelliklerini belirlemektir.

Gereç ve Yöntem: Bu metodolojik çalışma, bir üniversite hastanesinde yatmakta olan ve kronik hastalığa sahip 114 hasta ile, 2018 yılı haziran ayı içinde yürütülmüştür. Kapsam geçerliliği ve güvenirlik analizi sağlanmıştır. Orijinal ölçeğin Türkçe dil geçerliliği yapılmıştır.

Bulgular: Ordinal alfa değeri 0.80 olarak hesaplanmıştır, bu değer iç tutarlılığın yüksek olduğunu işaret etmektedir. Rasch analizi, ölçeğin tek boyutlu olduğunu göstermektedir. Maddeler arası polikorik korelasyon katsayısı 0.61'dir ve Kategorik Temel Bileşen Analizi'ne göre her faktör yükü 0.74'ten yüksektir.

Sonuç: Sonuç olarak, Hasta Katılımı Ölçeği'nin Türkçe uyarlamasının hasta katılımı fazlarını değerlendirmede yeterli psikometrik özelliklere sahip olduğu söylenebilir.

Anahtar kelimeler: kronik hastalık, hemşirelik, hasta katılımı, psikometrik özellikler

INTRODUCTION

Engaging patients in chronic care is recognized as a vital element of high-quality healthcare services, specifically when chronic disease management is taken into account[1, 2]. Since the nature of the chronic diseases requires change in life styles and needs an

Yazışma Adresi/Address for Correspondence: Dr. Dilara Usta, Hacettepe University, Faculty of Nursing, Department of Fundamentals of Nursing, Ankara, Turkey E-mail: dilarausta6@gmail.com
Geliş tarihi/Received: 13.11.2018 Kabul tarihi/Accepted: 26.02.2019 Çevrimiçi yayın/Published online: 08.09.2019

organized, proactive multicomponent, patient-centered approach, patients must be included as main actors of care process. Patient engagement is described as a patient-centered care model, in which healthcare professionals engage patients as peers to make decisions about their care, based on clinical evidence and patients' care expectations[3].

Patients' emotional, cognitive, and conative dynamics affect their attitudes and meaning-making skills during care[3,4]. This process is featured in four sequential phases: blackout, arousal, adhesion, and eudaimonic project[4,5]. *Blackout* phase, starting with a diagnose, patients describe their situation as unexpected and out of their control[6] which causes emotional confusion[3, 5]. Within the following phase, *arousal*, patients are highly aware of their every clinical symptoms which are perceived as an "alarm bell" leading permanent anxiety and negative feelings[4]. When patients have enough knowledge about their disease and behavioral skills to adhere medical treatment, the *adhesion* phase emerges.[3]. When patients completely adjust their condition and have a better psychological position is regarded as *eudaimonic project* phase[5].

Understanding patients' position in the engagement process provides clinicians and healthcare services to better adapt to enhance patients' role in their chronic care management[4]. Identifying the engagement phase allows clinicians to determine the approach to the patient. i.e. [1] stimulating patients in managing their care and playing an active role in treatment process, [2] providing the reliable information and support to strengthen their health literacy, [3] empowering patient's autonomy in decision making, [4] enabling the involvement of family in the caring process, and [5] reinforcing the team work among healthcare providers[7-9]. In blackout phase, clinicians are perceived as an information source and expected to act as supportive figures. In the arousal phase, patients generally express their need for clinician support and anticipate psychological help. Patients in the adhesion phase need to be supported both at the emotional and practical level. Finally in the eudaimonic project phase, the clinician is required to assist patients in chronic disease management strategies and help patients in making life plans[3].

Patient engagement in chronic disease management is positively related to life satisfaction[10,11], higher quality of life[12], better clinical outcomes[13], better patient self-management[14], perceiving a higher quality of life and enhanced health status[15-17], effective medication adherence and improved medication safety[14,17-20], and reduction in healthcare costs[21, 22].

Since the effective improvements in adapting methods of patient engagement are needed, it is critical to assess the phase of patient engagement with a validated tool to meet patients' needs and expectations more efficiently[23]. The PHE-s is first developed and validated by Graffigna et al.[4] to evaluate the psychosocial experience in patients with chronic disease. Additionally, the adaptations of the PHE-s in Chinese[24] and Spanish[25] languages are completed. In Turkey, there is no study to evaluate the patient engagement process. Therefore, in this study, it is aimed to conduct the Turkish validity and reliability study of the PHE-s in patients with chronic diseases.

MATERIALS AND METHODS

This methodological research was conducted to analyze the validity and reliability of the PHE-s in Turkish. It was conducted at the clinics of general internal medicine in a university hospital in June 2018. Patients with chronic diseases were recruited from among inpatients of general internal medicine department based on the following inclusion criteria: Patients [a] older than 18 years old, [b] literate, [c] diagnosed with chronic diseases, [d] following a medical treatment for the chronic disease/s and [e] not having a major psychiatric disease.

Written permissions were obtained from the authors who conducted the original scale development study. Our research was found acceptable by a university's ethics committee (GO 17/827) in Ankara, Turkey. The written permission of the institution has been taken from the relevant departments to conduct the research. Each patient received information about the study with an informed consent and was asked to give written permission. In addition, participants were notified about their right to withdraw and anonymity.

The sample size was estimated by multiplying the total number of items by ten. The 5-10 participants for per variable is commonly accepted in the literature[26, 27], yet Jöreskog and Sörbom[28] suggested that having 10 participants per parameter is sufficient. Therefore, for the PHE scale with 5 items, there should be at least 50 survey participants. The study was completed with 114 inpatients.

Patients were included in the study with simple

random sampling method. First, each participant was visited in patient room, given information about the study and were invited to the research. Then, the forms were distributed them and the structure of the PHE-s was clarified. It took about 10-12 minutes for each patient to fill in the forms.

Instruments

In data collection phase, the Sociodemographic Form prepared based on the literature by the authors and the PHE-s was used[4, 24, 25].

The Sociodemographic Form

In this form, there are a total of seven questions about the age, gender, marital status, education status, working status, type of chronic disease and when the patient was diagnosed.

Patient Health Engagement Scale

The scale was first developed and validated by Graffigna et al.[4] in Italy in 2015. The PHE-s was developed based on a 4-stage model of patient engagement which reflects a dynamic and complex process (blackout, arousal, adhesion and eudaimonic project)[4]. The PHE-s has an ordinal structure, consisted of five items with seven responses that potentially indicates the stages of engagement experience lived by the patients (See Table 1). Patients were asked to respond by positioning themselves between one and seven points in relation to their experience. The PHE-s allows patients to assess their engagement stage in intermediate positions (e.g. between arousal and adhesion). Thus, intermediate positions are referred to the former engagement phase, for example, a score of four points out the patient locates him/herself in the second phase of engagement meanwhile a point seven means a position in the fourth phase[4]. Figure 1 demonstrates the instruction form to be presented to the patients before filling in the scale. In course of calculating the final PHE-s score, the median value is regarded more substantial and reliable accordingly the scale's ordinal nature[29]. Procedure of calculating the PHE-s level is given in figure 2.

Table 1. Items of the PHE-s: Turkish version

	Items			
	Hastalığım hakkında düşündüğümde			
1	Tamamen karanlıkta kalmış gibi hissederim.	Telaşlanıyorum.	Durumumun farkındayım.	Olumlu hissediyorum.
2	Şaşkın hissediyorum.	Zor durumdayım.	Hastalığımın bilincindeyim.	Rahat/sakin hissediyorum.
3	Duygularla bunalmış hissediyorum.	Her yeni belirti ortaya çıktığında kaygılanıyorum.	Hastalığıma alıştım.	Hastalığıma rağmen hayatımı uyum ve devamlılık içinde hissediyorum.
4	Hastalığım yüzünden çok bezginim.	Hastalıkla baş etmeye çalıştığım zaman endişe hissediyorum.	Hastalığıma uyum sağladığımı hissediyorum.	Sağlık durumum ve geleceğimden genel olarak umutluyum.
5	Hastalığım nedeniyle büyük bir baskı altında hissediyorum.	Yeni bir belirti ortaya çıktığında üzülüyorum.	Hastalığımı kabullendiğimi düşünüyorum	Hastalığıma rağmen hayata anlam verebiliyorum.

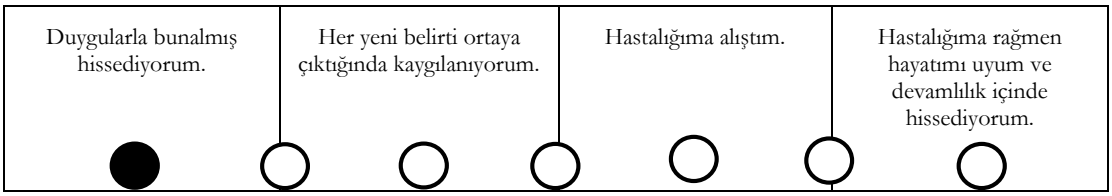
Figure 1. Instruction form of introducing the PHE-s to the patients (Graffigna et al. 2015b)[40]

Aşağıda sizin hastalığınıza uyumunuzu ve bakımınıza katılma durumunuzu belirlemek üzere hazırlanmış olan Hasta Katılımı Ölçeği' nin maddeleri yer almaktadır. Ölçek toplamda 5 satırdan oluşmaktadır. Her bir satırda 4 adet ifade ve 7 adet işaret seçeneği bulunmaktadır. Her bir satırda size uygun bulduğunuz "bir" seçeneği işaretleyiniz. Eğer yan yana bulunan iki ifadenin arasında kalmışsanız, ikisinin arasındaki seçeneği işaretleyiniz.

Soruları yanıtlamanıza yardımcı olacak bir örnek

Örnek 1

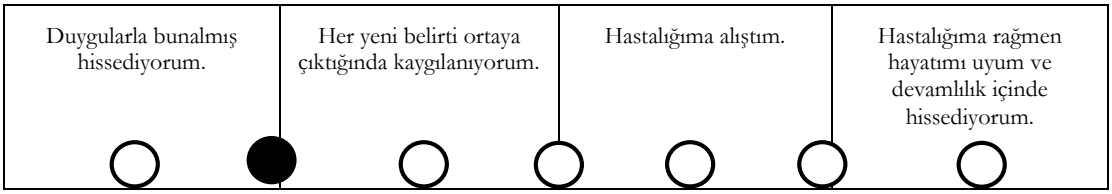
Hastalığım hakkında düşündüğümde…



Eğer hastalığınızın size hissettirdiği duygulardan bunalmış hissediyorsanız, ilk seçeneği işaretleyiniz.

Örnek 2

Hastalığım hakkında düşündüğümde…



Eğer hastalığınızın size hissettirdiği duygulardan bunalmış hissediyor ve aynı zamanda ortaya çıkan her yeni belirtiden dolayı kaygı duymaya başladıysanız, ikinci seçeneği işaretleyiniz.

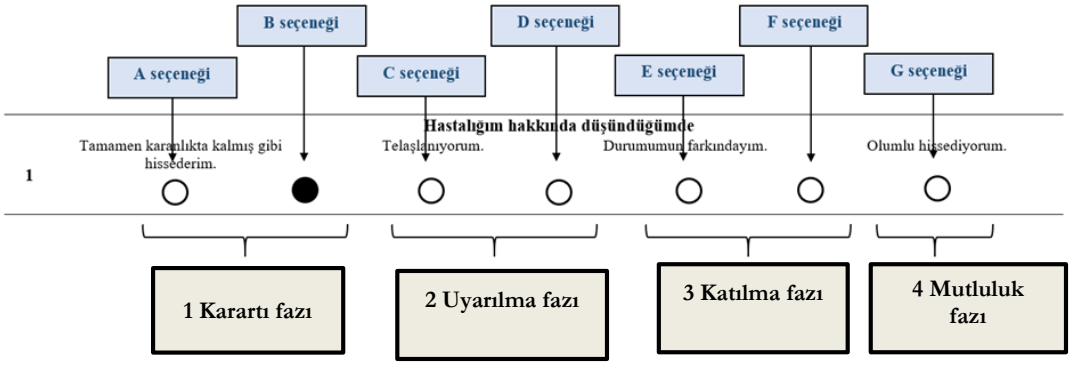
Translation process

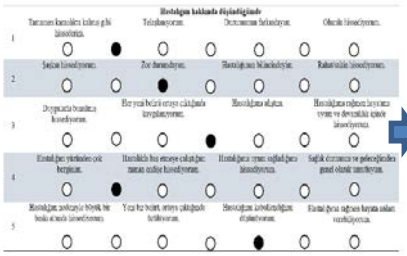
The method of the translation process[30, 31] followed these steps: [a] The PHE-s was first translated from English into Turkish by three academicians with competent English language skills from the faculty of nursing who are working in the relevant field. [b] The obtained translations were combined and turned into a single instrument by an assistant professor. [c] The congruity of the combined scale to Turkish was assessed by the Turkish Language and Literature specialist and arranged according to the recommendations. [d] Then the PHE-s, finalized in Turkish, was retranslated into English by three academicians who were experts in the area and proficient in English. [e] The final translation and the original format was compared by the author who developed the scale and was found compatible.

Content validity

The constituted Turkish version of the scale and the evaluation form[32] were submitted to 8 experts, including specialists of nursing services administration, obstetrics and gynecology, internal medicine, public health, and psychiatric nursing. These experts confirmed the first Turkish version of the PHE-s to assess its content validity with Turkish language.

Figure 2. Procedure to calculate the PHE-s level (Graffigna and Barello, 2016)





Sıra değeri	Ölçek puanı
B	1
C	2
D	2
B	1
E	3

Elde edilen ölçek madde puanları sıralanarak ortadaki değer bulunur.

1 1 2 2 3

Madde puanlarının medyanı, katılım fazını gösterir (Faz 2: Uyarılma)

Assessing reliability and data analysis

The data were examined with IBM SPSS 24.0, and R 3.2.4 software packages. The content validity was estimated using the content validity index (CVI), Scale-level Index Average (S-CVI/Ave), and the item-level (I-CVI)[33].

The psychometric properties of an ordinal scale

As the process of testing the psychometric properties of an ordinal scale, The Categorical Principal Component Analysis – one factor solution (CATPCA) was performed in exploratory analysis. Infit-Outfit mean square standardized (MNSQ), logits, Chi-Square, and p-value were estimated. In addition, the Rasch Model (RM) was carried out to additional investigation if the PHE-s was unidimensional. If the data suited the RM, the MNSQ values should be between 0.6-1.4 and all of the thresholds should be below the limit of 4.0 logit[34]. Moreover, the Person Separation Index (PSI) was used to evaluate the reliability of the RM. Finally, the

internal consistency was calculated with Ordinal Alpha via Empirical Copula Index. The item-item polychoric correlation was shown which is considered as a subtype of internal consistency reliability[35, 36]. A reliability index which is more than 0.7, 0.8, or 0.9 can be defined as "acceptable, good, or excellent", respectively[37].

RESULTS

Participants (n=114) in the study were 50.9% male, aged between 18 and 82 (M=55.9, SD=14.5) (27.2% of the patients are older than 65), and 71.9% of them were married. Most of the patients (38.6%) were graduated from elementary school, and 43% were unemployed. The patients' average hospitalization period for current stay was 9.7 ± 12.2 days and the average duration from the first diagnosis was 8.2 ± 9.0 years. Chronic diseases of the patients can be seen in Table 2.

As content validity analysis, the CVI was performed. It was found that the I-CVI values varied 0.87-1.00, and the S-CVI/Ave was 0.98 in the PHE-s. In Table 3 these are reported, for each item, descriptive statistics (minimum, maximum, and range, median as tendency central index and Shannon Entropy as dispersion index, due by the ordinal nature of the data).

Exploratory analysis

The exploratory analysis conducted by a CATPCA suggested only one factor (eigenvalue equal to 3.2), explaining 62.8% of the total variability. The factor loadings had a value superior to 0.70. The unidimensionality of the scale is confirmed (Table 4).

Internal consistency

The internal consistency was measured by the average inter-item polychoric correlation index, obtained by the average of all polychoric correlation coefficients. The polychoric correlation coefficient is a correlation measure, suitable for ordinal data. Every polychoric correlation coefficient was higher than 0.5. The average inter-item polychoric correlation is equal to 0.61, which indicates a high correlation between items (Table 5).

The internal consistency is also measured by the Ordinal Alpha via Empirical Copula, equal to 0.80. So PHE scale showed a good internal consistency. In Table 6, the Ordinal Alpha was evaluated after deleting individual items. Since deleting every item the value of Ordinal alpha decreases, then each item contributed significantly to the PHE scale score. Overall, the study of the internal consistency of the PHE-s was satisfactory.

RASCH analysis

The item analysis was conducted by Infit and Outfit statistics. Their value ranged from 0.721 – 0.881, all within the acceptable range. The reliability in the Rasch Model was evaluated by the Person Separation Index (PSI = 0.848) (Table 7).

Table 2. Chronic diseases of patients

Chronic disease*	n (%)
Diabetes mellitus	38 (33.3)
Hypertension	33 (28.9)
Cancer**	25 (21.9)
Cardiovascular disorder	21 (18.4)
Chronic renal failure	15 (13.2)
Rheumatologic disorders	11 (9.7)
Chronic obstructive pulmonary disease	9 (7.9)
Anemia	5 (4.4)
Cushing syndrome, Hypothyroidism, Goiter	5 (4.4)
Asthma, Chronic bronchitis	4 (3.5)
Chronic liver failure, Celiac disease, Chronic pancreatitis, Cystic fibrosis	4 (3.5)
Systemic lupus erythematosus	4 (3.5)
Hyperlipidemia	3 (2.6)
Osteoporosis	1 (0.9)

*Multiple data; **Patients with leukemia, lymphoma, multiple myeloma, lung, breast, and thymus cancers

Table 3. Item-level descriptive statistics for ranks on the PHE.

PHE Item	Rank Range	Minimum	Maximum	Median	Shannon Entropy
Item 1	1-4	1	4	3	0.82
Item 2	1-4	1	4	3	0.81
Item 3	1-4	1	4	3	0.89
Item 4	1-4	1	4	3	0.76
Item 5	1-4	1	4	3	0.77

Table 4. Factor loadings from Categorical Principal Component Analysis (CATPCA) – One factor solution

PHE Item	One factor solution
Item 1	0.748
Item 2	0.804
Item 3	0.831
Item 4	0.785
Item 5	0.793

Table 5. Item-item polychoric correlation matrix for ranks on the PHE

PHE Item	Item 1	Item 2	Item 3	Item 4	Item 5
Item 1	-	0.61	0.61	0.58	0.52
Item 2		-	0.67	0.56	0.57
Item 3			-	0.57	0.63
Item 4				-	0.70
Item 5					-

Table 6. Ordinal alpha via empirical copula if item deleted

Item	Ordinal Alpha if item deleted
Item 1	0.77
Item 2	0.75
Item 3	0.74
Item 4	0.76
Item 5	0.76

Table 7. PHE Scale – Rasch Analysis

PHE Item	Measure (logits)	Infit MNSQ	Outfit MNSQ	Chi-Square (df)	p-value
Item 1	0.75	0.881	0.831	90.54 (108)	0.89
Item 2	0.20	0.813	0.756	82.40 (108)	0.97
Item 3	0.63	0.721	0.741	80.81 (108)	0.98
Item 4	-0.78	0.834	0.822	89.58 (108)	0.90
Item 5	-0.73	0.844	0.804	87.64 (108)	0.93

DISCUSSION

In this research, we conducted the validity-reliability study of the PHE-s into Turkish and examined the psychometric properties in patients with chronic diseases. For the content validity of the PHE-s, the CVI was used which was obtained from the expert evaluations. It is stated that the content validity indexes of the items should be above 0.80 in order to be sufficient[38]. In this study, the I-CVI values ranged between 0.87-1.00 and the S-CVI/Ave was 0.98, which presented a very high validity. The exploratory analysis (CATPCA) confirmed that all factors had a very high value (ranging from 0.74 to 0.83), that means the CATPCA suggests the PHE-s fit in with a single-factor and unidimensional construct. The CATPCA was performed through the ordinal nature of the items of the PHE-s [4].

The average inter-item polychoric correlation (0.61) showed a high correlation between items as in the original version of the PHE-s (0.68). In this study, the Ordinal Alpha via Empirical Copula was calculated, since this version prevents the assumption by the researcher about the dependency type for hidden variables underlying the ordinal indicators [4]. The data obtained from the PHE-s indicated a good internal consistency for patients with chronic diseases by Ordinal Alpha (α=0.80). In the Italian, Chinese, and Spanish versions, the Ordinal Alpha values were found 0.85, 0.89, and 0.85, respectively[4, 24, 25].

The Rasch analysis was performed to investigate if the PHE-s was unidimensional and the items fit the model sufficiently[4]. The analysis demonstrated a good series of infit values (ranged 0.721 – 0.881) for each items of the PHE-s, which was acceptable. If the data fitted the Rasch model, the statistics could be between 0.6 and 1.4[34]. In the original version of the scale, the Rasch analysis varied 0.62 to 1.14[4].

In conclusion, our study showed the evidence that the PHE-s in Turkish population has a satisfactory psychometric properties in patients with chronic diseases. Thanks to its ordinal and short structure, it can be easily implemented into the health care which allows the professionals to sustain patient-centered care experiences. It is known that engaging patients in their healthcare experience has a positive impact on their adherence in treatment and health care management[39]. For that reason, it is recommended that implementing the PHE-s in health care settings to better understand the engagement levels of patients with chronic diseases.

Yazar Katkıları: Çalışma konsepti/Tasarımı: DU, FK, İA; Veri toplama: DU; Veri analizi ve yorumlama: : DU, FK, İA, AB; Yazı taslağı: DU, FK, İA, AB; İçeriğin eleştirel incelenmesi: DU, FK, İA, AB; Son onay ve sorumluluk: DU, FK, İA, AB; Teknik ve malzeme desteği: DU; Süpervizyon: DU, İA, FK; Fon sağlama (mevcut ise): yok.
Bilgilendirilmiş Onam: Katılımcılardan yazılı onam alınmıştır.
Hakem Değerlendirmesi: Dış bağımsız.
Çıkar Çatışması: Yazarlar çıkar çatışması beyan etmemişlerdir.
Finansal Destek: Yazarlar finansal destek beyan etmemişlerdir.
Teşekkür: PHE'leri Türkçe'ye çevirmeye ve uyarlamaya izin verdiği için Guendalina Graffigna, Serena Barello ve Edoardo Lozza'ya hepimiz teşekkür ediyoruz. Çalışmaya katılan hastalara ve profesyonellere, çeviri geri dönüş ve içerik geçerliliği süreçlerinde değerli katkılarından dolayı minnettarız.

Author Contributions: Concept/Design : DU, FK, İA, ; Data acquisition: DU; Data analysis and interpretation: DU, FK, İA, AB; Drafting manuscript: DU, FK, İA, AB; Critical revision of manuscript: DU, FK, İA, AB; Final approval and accountability: DU, FK, İA, AB; Technical or material support: DU; Supervision: DU, İA, FK; GÖ; Securing funding (if available): n/a.
Informed Consent: Written consent was obtained from the participants.
Peer-review: Externally peer-reviewed.
Conflict of Interest: Authors declared no conflict of interest.
Financial Disclosure: Authors declared no financial support

Acknowledgments: We all thank to Guendalina Graffigna, Serena Barello, and Edoardo Lozza for permitting to translate and adapt the PHE-s into Turkish language. We are grateful to the patients who participated in the study and to professionals for their precious contributions in translation-back translation and content validity processes.

REFERENCES

1. Graffigna G, Barello S, Libreri C, Bosio CA. How to engage type-2 diabetic patients in their own health management: implications for clinical practice. BMC Public Health. 2014;14:648.
2. Wyatt KD, Stuart LM, Brito JP, Carranza Leon B, Domecq JP, Prutsky GJ et al. Out of context: clinical practice guidelines and patients with multiple chronic conditions: a systematic review. Med Care. 2014;52:92-100.
3. Barello S, Graffigna G, Vegni E, Savarese M, Lombardi F, Bosio AC. 'Engage me in taking care of my heart': a grounded theory study on patient–cardiologist relationship in the hospital management of heart failure. BMJ Open. 2015;5:E005582
4. Graffigna G, Barello S, Bonanomi A, Lozza E. Measuring patient engagement: development and psychometric properties of the Patient Health Engagement (PHE) scale. Front Psychol. 2015;6:274.
5. Graffigna G, Barello S, Bonanomi A, Riva G. Factors affecting patients' online health information-seeking behaviors: the role of the Patient Health Engagement (PHE) Model. Patient Educ Couns. 2017;100-10:1918-27.
6. Mazzoni D, Cornet A, Leeuw B, Myllys K, Cicognani E. Living with systemic lupus erythematosus: A patient engagement perspective. Musculoskeletal Care. 2018;16:67-73.
7. Pelletier LR, Stichler JF. Action brief: patient engagement and activation: a health reform imperative and improvement opportunity for nursing. Nurs Outlook. 2013;61:51-4.
8. Laschinger HK, Gilbert S, Smith LM, Smith LM, Leslie K. Towards a comprehensive theory of nurse/patient empowerment: applying Kanter's empowerment theory to patient care. J Nurs Manag. 2010;18:4-13.
9. Barello S, Graffigna G, Pitacco G, Mislej M, Cortale M, Provenzi L. An educational intervention to train professional nurses in promoting patient engagement: a pilot feasibility study. Front Physiol. 2017;7:2020.
10. Van Campen C, Van Santvoort M. Explaining low subjective well-being of persons with disabilities in Europe: The impact of disability, personal resources, participation and socio-economic status. Soc Indic Res. 2013;111:839-854.
11. Manary MP, Boulding W, Staelin R, Glickman SW. The patient experience and health outcomes. New Engl J Med. 2013;368:201-3.
12. Barello S, Graffigna G, Savarese M, Claudio BA. Engaging patients in health management: towards a

preliminary theoretical conceptualization. Psicologia della Salute. 2014;3:11-33.
13. Lubetkin EI, Lu W-H, Gold MR. Levels and correlates of patient activation in health center settings: building strategies for improving health outcomes. J Health Care Poor U. 2010;21:796-808.
14. Hibbard JH, Greene J. What the evidence shows about patient activation: Better health outcomes and care experiences; fewer data on costs. Health Affair. 2013;32:207-14.
15. Barello S, Graffigna G. Engaging patients to recover life projectuality: an Italian cross-disease framework. Qual Life Res. 2015;24:1087-96.
16. Hibbard JH, Mahoney ER, Stock R, Tusler M. Do increases in patient activation result in improved self-management behaviors? Health Serv Res. 2007;42:1443-63.
17. Zolnierek KBH, DiMatteo MR. Physician communication and patient adherence to treatment: a meta-analysis. Med Care. 2009;47:826.
18. Bonaventura KR, Milner KA. Patient engagement in management of warfarin: A quality improvement study. J Nurse Pract. 2016;12:E105-9.
19. Wilson SR, Strub P, Buist AS, Knowles SB, Lavori PW, Lapidus J et al. Shared treatment decision making improves adherence and outcomes in poorly controlled asthma. Am J Resp Crit Care. 2010;181:566-77.
20. Milner KA, Bonaventura KR. Self-management of Warfarin: An approach to increase patient engagement in care. J Nurse Pract. 2017;13:E389-93.
21. Hibbard JH, Greene J, Overton V. Patients with lower activation associated with higher costs; delivery systems should know their patients 'scores'. Health Affair. 2013;32:216-22.
22. Oshima LE, Emanuel EJ. Shared decision making to improve care and reduce costs. New Engl J Med. 2013;368:6-8.
23. Graffigna G, Barello S. The value of measuring patient engagement in healthcare: new frontiers for healthcare quality. In Promoting Patient Engagement and Participation for Effective Healthcare Reform, ed G Graffigna): 192-214. Hershey, PA, IGI Global, 2016.
24. Zhang Y, Graffigna G, Bonanomi A, Choi KC, Barello S, Mao P. Adaptation and validation of a Chinese version of Patient Health Engagement Scale for patients with chronic disease. Front Psychol. 2017;8:104.
25. Magallares A, Graffigna G, Barello S, Bonanomi A, Lozza E. Spanish adaptation of the Patient Health Engagement scale (S. PHE-s) in patients with chronic diseases. Psicothema. 2017;29:408-13.
26. Streiner DL. Figuring out factors: the use and misuse of factor analysis. Can J Psychiatry. 1994;39:135-40.
27. Tinsley HE, Tinsley DJ. Uses of factor analysis in counseling psychology research. J Couns Psychol 1987;34:414.
28. Jöreskog K, Sörbom D. LISREL-VII Users Reference Guide. Mooresville, IN: Scientific Software. Inc, 1989.
29. Graffigna G, Barello S, Bonanomi A. The role of Patient Health Engagement Model (PHE-model) in affecting patient activation and medication adherence: A structural equation model. PloS one 2017;12: e0179865.
30. WHO. Process of translation and adaptation of instruments. http://www.who.int/substance_abuse/research_tools/translation/en/ (accessed Jan 2019).
31. Alpar R. Uygulamalı İstatistik ve Geçerlik-Güvenirlik: Spor, Sağlık ve Eğitim Bilimlerinden Örneklerle. Ankara, Detay Yayıncılık, 2010.
32. Lawshe CH. A quantitative approach to content validity. Pers Psychol. 1975;28:563-75.
33. Polit DF, Beck CT. Nursing Research: Generating and Assessing Evidence for Nursing Practice. Philadelphia: PA, Lippincott Williams&Wilkins, 2012.
34. Wright B, Linacre J, Gustafson J. Reasonable mean-square fit values. Rasch Meas Trans. 1994;8:370.
35. Bonanomi A, Cantaluppi G, Ruscone MN, Osmetti S. A new estimator of Zumbo's Ordinal Alpha: a copula approach. Quality Quantity. 2015;49:941-53.
36. Bonanomi A, Nai Ruscone M, Osmetti SA. Reliability measurement for polytomous ordinal items: the empirical polychoric ordinal Alpha. Quaderni di Statistica. 2012;14:53-6.
37. Gliem JA and Gliem RR. Calculating, interpreting, and reporting Cronbach's alpha reliability coefficient for Likert-type scales. In: 2003, Midwest Research-to-Practice Conference in Adult, Continuing, and Community Education.
38. Yurdugül H. Ölçek geliştirme çalışmalarında kapsam geçerliği için kapsam geçerlik indekslerinin kullanılması. XIV Ulusal Eğitim Bilimleri Kongresi Özet Kitabı, Denizli, 28-30 Eylül 2005;1:771-4.
39. Zuckerman B, Margolis PA, Mate KS. Health services innovation: The time is now. JAMA. 2013;309:1113-4.
40. Graffigna G, Barello S, Bonanomi A, et al. Measuring patient activation in Italy: translation, adaptation and validation of the Italian version of the patient activation measure 13 (PAM13-I). BMC Med Inform Decis Mak. 2015b;15:109.
41. Graffigna G. Promoting Patient Engagement and Participation for Effective Healthcare Reform. IGI Global, 2016.