Agri 2022;34(2):91–99
doi: 10.14744/agri.2022.35902

ORIGINAL ARTICLE

Adaptation of the pain management self-efficacy questionnaire into Turkish

Ağrı yönetimi öz yeterlilik ölçeğinin türkçeye uyarlanması

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Summary

Objectives: The aim of this study is to examine the Turkish validity and reliability of the Pain Management Self-Efficacy Questionnaire (PMSEQ).

Methods: The study was carried out descriptively and methodologically between September and December 2018 with 214 nurses and 248 nursing students. The data were collected using the descriptive characteristics form and the PMSEQ.

Results: Cronbach's alpha internal consistency coefficient was 0.90 in the total scale. In repeated measurements to test time reliability, there was no statistically significant difference between the two measurements (t=0.320, p=0.751), and there were a high power and positively highly significant relationship (r=0.997, p<0.001).

Conclusion: Turkish version of the PMSEQ can be used as a valid and reliable scale in assessing the self-efficacy of clinical nurses and nursing students in pain management.

Keywords: Management; nurse; pain; reliability; self-efficacy; validity.

Özet

Amaç: Bu çalışmanın amacı, Ağrı Yönetimi Öz Yeterlilik Ölçeğinin Türkçe geçerlilik ve güvenilirliğini incemelektir.

Gereç ve Yöntem: Çalışma, Eylül-Aralık 2018 tarihleri arasında 214 hemşire ve 248 hemşirelik öğrencisiyle tanımlayıcı ve metodolojik olarak yapıldı. Veriler, tanıtıcı özellikler formu ve Ağrı Yönetimi Öz Yeterlilik Ölçeği kullanılarak toplandı.

Bulgular: Ölçeğin Cronbach alfa iç tutarlılık katsayısı 0,90 olarak bulundu. Zaman güvenilirliğini test etmek için tekrarlanan ölçümlerde, iki ölçüm arasında istatistiksel olarak anlamlı bir fark bulunmadı (t=0,320, p=0,751), yüksek güç ve pozitif olarak yüksek anlamlı bir ilişki vardı (r=0,997, p<0,001).

Sonuç: Ağrı Yönetimi Öz Yeterlilik Ölçeğinin Türkçe versiyonu klinik hemşireler ve hemşirelik öğrencilerinin ağrı yönetiminde öz yeterliliklerini değerlendirmede geçerli ve güvenilir bir ölçek olarak kullanılabilir.

Anahtar sözcükler: Ağrı; geçerlilik; güvenilirlik; hemşire; öz yeterlik; yönetim.

Introduction

Pain, a universal experience that man has ever experienced since his/her existence is a multidimensional phenomenon influenced by ethnicity, previous pain experiences, and individual coping strategies.[1] The International Pain Research Association defined pain as "An unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage".[2] The Joint Commission 2018 report emphasizes the importance of appropriate screening, assessment, and treatment of physical pain for all patients, but also states that patients should be included in the treatment plan and have individual goals.[3] Every year millions of people experience pain, and this frequency increases parallel to the increase in acute and chronic diseases.[4] There-

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Submitted *(Başvuru tarihi)* **12.10.2020 Accepted after revision** *(Düzeltme sonrası kabul tarihi)* **27.07.2021 Available online date** *(Online yayımlanma tarihi)* **08.04.2022**

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fore, effective management of pain treatment is very important. If pain cannot be controlled, it may lead to prolongation of recovery time, deterioration in sleep quality, suppression of immune system, decreased activity, malnutrition, anxiety, depression, and decrease in quality of life of the individual.[5-8] It is also emphasized that the pain experienced by patients causes various financial losses in health care organizations.[9]

Pain assessment and management are individual and based on the patient's statements. The Pain Association states that pain management is a human right and patients should be informed about how to assess and manage their pain.[10,11] Today, although there are guidelines for pain management, the pain remains an untreatable problem for patients.[10,12] Differences in the way health professionals perceive, evaluate, and treat pain can occur in all clinical settings.[13] Since nurses spend more time with patients than other health professionals, they have an important role in the assessment and management of pain. Therefore, nurses have the opportunity to develop and implement health care treatments that can provide relief to patients experiencing pain.[14,15] Related studies report that ineffective pain management may result from nurses' lack of knowledge and behavior as well as inadequate measurement tools related to pain management.[16-19]

Although there is a 7-item questionnaire for the evaluation of self-efficacy in pain and 6-item questionnaire for the management of pain in children used in the literature, a need for more comprehensive measurement tool for health professionals is also emphasized.[20,21] As seen in the literature, self-efficacy plays an important role in pain management for safe and quality patient care and treatment. In Turkey, there is no scale developed to determine the self-efficacy of nurses in pain management. With this in mind, this study aimed to test the psychometric properties of the Pain Management Self-Efficacy Questionnaire (PMSEQ), which was developed to determine the self-efficacy of nurses in pain management and to provide a valid and reliable measurement tool for use in the Turkish sample.

Material and Methods

Design

The study was conducted descriptively and methodologically.

Sample

The study sample consisted of nurses working in two hospitals in Kırklareli and nursing students studying in the nursing department of a university (total nurse n=242, total student n=311). For the validity and reliability studies, the number of sample is recommended to be 5–10 times more than the number of items in the scale.[22,23] In this study, considering the number of items of the scale, it was aimed to reach 210 nurses and nursing students for the 21-item scale. The sample of the study consisted of 214 nurses and 248 nursing students who accepted to participate in the study.

Data Collection Form

In the data collection, a descriptive characteristics form developed by the researchers and the PMSEQ consisting of 21 items were used.

Descriptive Characteristics Form

It consists of seven questions about the socio-demographic (age, gender, marital status, educational status, patients' characteristics, work, and certificate about pain) characteristics of the participants.

The PMSEQ

It was developed in 2018 by Macindo et al.[4] to measure the perceived confidence of both Registered Nurses and student nurses in rending pain management to an array of patients. It has 21-items in three sub-dimensions. They are following as: "Comprehensive Pain Management Self-Efficacy (C-PMSE, 14 Items)," "Evaluative Pain Management Self-Efficacy (E-PMSE, 4 Items)" and "Supplemental Pain Management Self-Efficacy (S-PMSE, 3 Items)". The questionnaire answered on a 6-point bipolar scale, with 0 as "not confident at all" to 5 "highly confident." Subscale and scale scores are acquired by adding the individual scores in each domain. All items are positively-stated; hence, there is no need for reverse coding.

Data Collection

A two-stage approach was used in the study. In the first stage, the adaptation process was carried out to adapt the original scale items to Turkish. At this stage, the pilot test was performed. The form, which was prepared in accordance with expert opinions, was applied to 15 nursing students and 15 nurses to evaluate the clarity and intelligibility of the statements. After the researchers made necessary changes to

these statements, they finalized the scale items to be applied to the main sampling. In the second stage, the adapted draft scale was applied to the research sample, and the validation process was followed.

Data Analysis

The stages and analyzes used in the adaptation of the Turkish version of the PMSEQTR are as follows;

The data of the study were analyzed in IBM SPSS Statistics 21 and LISREL 8.51 programs. In the analysis of the data, the participants' descriptive information was calculated using descriptive analysis (number, percentage, mean, standard deviation). The opinions of the experts were analyzed according to the Davis technique, and the minimum content validity index was taken as 0.80. Kaiser Meyer Olkin (KMO) and Bartlett's test of sphericity were used to determine the adequacy and suitability of the sample. Confirmatory Factor Analysis was performed to test the fit of the factor structure, factor loadings above 0.30, and goodness of fit indices were paid attention to be within acceptable limits according to Kline.[24] Item analysis was performed to test the relationship between scale items and total, and the lower limit for item-total score correlation values was accepted as 0.30. Cronbach's alpha coefficient was calculated to test the internal consistency of the measurements. Finally, paired-samples t-test and Pearson moment correlation analyses were used to test the invariance of measurements against time.

Ethical Considerations

The permission for adaptation of PMSEQ to Turkish was obtained from person who developed the scale. Ethical approval was obtained from the Ethical Committee. Furthermore, verbal and written consent was obtained from the participants.

Results

Participant Characteristics

A total of 462 people, 248 of whom were nursing students and 214 were nurses, participated in the study. The mean age of the students was 22.23±1.50, and most of them were female (78.6%). All the students were caring for both children and adults/elderly patients (100%) within the scope of their clinical training, and most of them received pain management training (85.1%) and rated their self-confidence levels as four (62.5%). The mean age of the nurses was 35.52±8.63 years, they were mostly female (77.6%), married (72.4%), and bachelor's degree (58.4%). Most of the nurses only cared for adults/elderly patients (90.7%) and had no pain management training (82.7%), but their self-confidence scores were four (50.9%; [Table 1]).

The Adaptation Process Results

The PMSEQ was translated from English into Turkish by six different translators to identify the equivalence of concepts and map the concepts to the target culture. After the examination of the Turkish items by the authors, a common form was developed, and these forms were retranslated into English by six translators who are fluent in both English and Turkish. The retranslated English form and the original form were sent to person by e-mail who developed the scale. When the response "there is no change in meaning" was taken, the retranslated Turkish form was used for an expert opinion.

The Turkish scale which met the language validity and the original scale was delivered to an expert committee (including 10 academic nurses). The experts' opinions were taken by an e-mail, or printed form, and the experts examined the items of the scale regarding its clearness and cultural convenience. According to the expert opinions obtained from 10 experts who evaluated the items according to the Davis technique, the content validity index was found to be 1.00. None of the items were excluded from the questionnaire.

The Validation Process Results

Confirmatory factor analysis was performed to assess the consistency of the original structure of the scale in the Turkish sample. However, its compatibility with KMO coefficient, Bartlett's test of sphericity, and factor analysis were examined beforehand. KMO coefficient was 0.930 and Bartlett test was significant ($x2=3011.447$, $p<0.001$).

The analyses were tested both in the whole sample and in nursing students and nurses separately, and the results are reported in Table 2. In all three models, factor loadings of the items were over 0.30. The goodness of fit indices was examined to evaluate the fit of the model. The goodness of fit was found to be within acceptable limits or close to an acceptable

Table 1. Demographic characteristics of nursing students and nurses (n=462)

Characteristics	Total Mean (SD)		Nursing students (n=248) Mean (SD)		Nurses (n=214) Mean (SD)	
Age	28.39 (8.92)		22.23 (1.50)		35.52 (8.63)	
	n	%	n	%	n	%
Gender						
Male	101	21.9	53	21.4	48	22.4
Female	361	78.1	195	78.6	166	77.6
Marital status						
Single	300	64.9	241	97.2	59	27.6
Married	162	35.1	7	2.8	155	72.4
Educational status						
MVHS	36	7.8	–		36	18.6
Associate degree	48	10.4	–		48	22.4
Undergraduate students	248	53.7	248	100	–	
Bachelor's degree	125	27.1	–		125	58.4
Postgraduate degree	5	1.1	–		5	2.3
Patient population						
Only pediatrics	20	4.3	–		20	9.3
Only adults/geriatrics	194	42.0	–		194	90.7
All	248	53.7	248	100	–	
Pain management training						
Yes	248	53.7	211	85.1	37	17.3
No	214	46.3	37	14.9	177	82.7
Self-confidence score						
1 point	–		–		–	
2 point	2	0.4	1	0.4	1	0.5
3 point	76	16.5	46	18.5	30	14.0
4 point	264	57.1	155	62.5	109	50.9
5 point	120	26.0	46	18.5	74	34.6

SD: Standard deviation; n: Frequency; MVHS: Medical vocational high school.

level. For this reason, the original structure of the scale was preserved in the following analyzes.

The suitability of the factor structure of the scale to its original form was evaluated by confirmatory factor analysis. Root Mean Squared Errors of Approximate (RMSEA) 0.058, Goodness-of-Fit Index (GFI) 0.91, Adjusted GFI 0.89, Comparative Fit Index 0.90, Normed Fit Index (NFI) 0.85, Non-NFI 0.89, Incremental Fit Index was found to be 0.90 (Fig. 1).

Item-total corrected correlations were examined to determine the relationship between scale items and the factor. They were found to be 0.30 and above in the scale total and ranged between 0.30 and 0.59 in the sub-dimensions (Table 3). In the Cronbach's alpha internal consistency coefficient analysis performed to determine the internal consistency of the measurements obtained from the sample, it was found that the subscale measurements ranged between α=0.61 and α=0.86, and the total of the scale was α=0.90 (Table 3).

To test the invariance of the measurements over time, measurements were performed with a sample of 60 nurses consisting of 30 nurses and 30 nurses at two

Table 2. Goodness of fit index for total sample, nursing students and nurses

PMSEQTR	Factor loadings	χ^2	Df	χ^2/df	RMSEA	GFI	AGFI	CFI
Fit values[†]								
Normal				≤2	≤0.05	≥0.95	≥0.95	≥0.95
Acceptable				≤3	≤0.08–1	≥0.90	≥0.90	≥0.90
Original models								
Model 1 (Total)	≥0.31	478.79	186	2.53	0.058	0.91	0.89	0.90
Model 2 (Nursing students)	≥0.30	451.75	186	2.43	0.056	0.89	0.86	0.83
Model 3 (Nurses)	≥0.30	330.40	186	1.78	0.082	0.83	0.79	0.88

[†]: According to Kline 1994. PMSEQTR: Pain Management Self-Efficacy Questionnaire Turkish; Df: Degrees of freedom; RMSEA: Root Mean Squared Errors of Approximate; GFI: Goodness-of-Fit Index; AGFI: Adjusted goodness of fit index; CFI: Comparative fit index.

weeks intervals. In the measurements, it was determined that there was no statistically significant difference between the mean scores of the participants in the scale total and sub-dimensions (p>0.05). On the other hand, the relationships between the two measurements were positive, very strong, and very statistically significant (r≥0.979; p<0.001; [Table 4]).

Discussion

In this study, which aimed to adapt the PMSEQ to Turkish developed by Macindo et al.,[4] it was aimed to preserve the original structure of the scale without deterioration, and the trend in the analysis results was in this direction. Throughout the process, the researchers preferred to re-order the meaning of the items or to take acceptable lower limits as a basis rather than eliminate items from the scale during the process. The results obtained from the analysis of the research data are presented under two headings as in the results section. The adaptation process in the process of adapting PMSEQ into Turkish is given under a title, and the validation process obtained from the application of PMSEQTR to 462 people is collected under the second heading.

Adaptation Process

Expert opinions are consulted for the content validity of a scale. The scale items are restructured according to the opinions and suggestions of the experts.[25] In this study, expert opinion was used to determine the content validity of the PMSEQTR and the Davis technique was used to evaluate expert opinions. The views of experts on the propositions in the Davis technique are scored between one (1-not appropriate) and four (4-completely appropriate). If the experts evaluate 80% of the items between 3-4 points, the content validity score is determined as 0.80.[22] The scale validity index is expected to be over 0.80 to say that the scale has content validity.[26] The original version of the scale was 42 items, and the average CVI score was 1.00. As a result of the evaluation, the CVI score was also calculated as 1.00 in this study. This value indicates that the language and content structure of the PMSEQTR scale is understandable and appropriate.

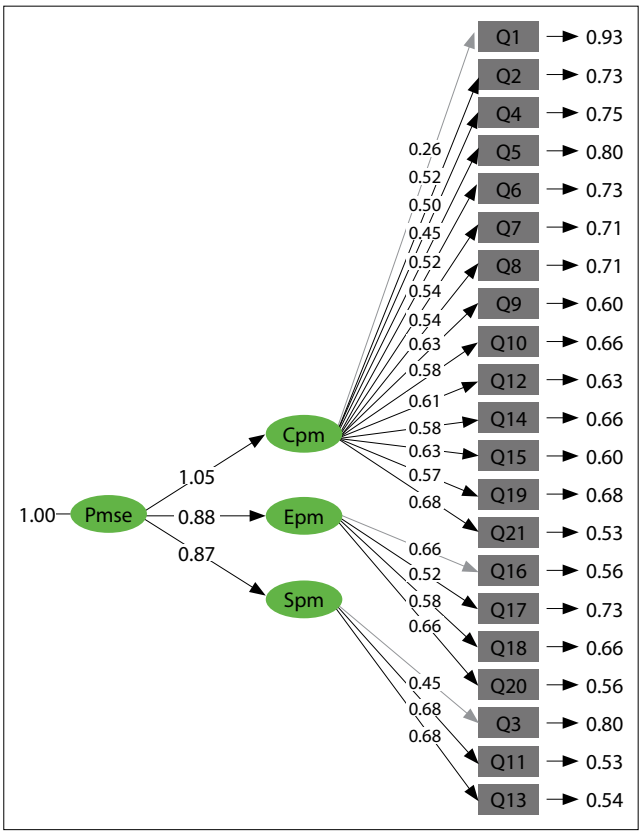

Figure 1. Confirmatory factor analysis.

Pmse: Pain Management Self-Efficacy; Cpm: Comprehensive Pain Management; Epm: Evaluative Pain Management; Spm: Supplemental Pain Management .

Table 3. Descriptive and psychometric properties of PMSEQTR and subscales (n=462)

PMSEQTR	n	r	α range	Possible range	Actual	Mean (SD)
PMSEQTR	21	≥0.30	0.90	0–105	45–105	82.33 (11.14)
C-PMSE	14	≥0.30	0.86	0–70	29–70	55.87 (7.44)
E-PMSE	4	≥0.58	0.70	0–20	6–20	15.56 (2.71)
S-PMSE	3	≥0.59	0.61	0–15	3–15	10.90 (2.25)

n: Item numbers; r: Corrected item-total correlation; α: Cronbach's alpha; SD: Standard deviation; PMSEQTR: Pain Management Self-Efficacy Questionnaire Turkish; C-PMSE: Comprehensive Pain Management Self-Efficacy; E-PMSE: Evaluative Pain Management Self-Efficacy; S-PMSE: Supplemental Pain Management Self-Efficacy.

Table 4. Test-retest reliability of PMSEQTR and subscales (n=60)

PMSEQTR	Total Mean (SD)	t/p	r/p
PMSEQTR			
1st	64,76 (7.04)	t=0.320, p=0.751	r=0.997, p<0.001*
2nd	64.70 (7.07)		
C-PMSE			
1st	44.43 (4.99)	t=1.766, p=0.088	r=0.995, p<0.001*
2nd	44.40 (4.98)		
E-PMSE			
1st	12.37 (2.78)	t=1.545, p=0.133	r=0.992, p<0.001*
2nd	12.23 (2.76)		
S-PMSE			
1st	7.97 (1.97)	t=0.110, p=0.906	r=0.979, p<0.001*
2nd	8.07 (1.89)		

*p<0.001. PMSEQTR: Pain Management Self-Efficacy Questionnaire Turkish; SD: Standard deviation; t: Paired sample t-test; r: Pearson correlation (two tailed); C-PMSE: Comprehensive Pain Management Self-Efficacy; E-PMSE: Evaluative Pain Management Self-Efficacy; S-PMSE: Supplemental Pain Management Self-Efficacy; 1st: Test results; 2nd: Re-test results.

Before the scale is applied to the target group, piloting should be done in a small group similar to the target group.[27] With the pilot testing, the scale is tried in the real environment, possible errors are eliminated, application time is determined, and if there are unclear points, they are omitted. As a result of the pilot test, it was reported that the 6th and 12th items were not understood by nursing students, and 3rd, 16th, 18th items were not understood by nurses. In line with this feedback, the scale was finalized and made ready for the implementation of the validity and reliability study.

Validation Process

For each of the 21 statements in the PMSEQ, it was aimed to reach at least 10 people, as suggested in the literature.[22,23] The target was achieved by applying PMSEQTR to 462 samples, 248 and 214 of whom were nursing students and nurses respectively. Besides, the adequacy of the sample matrix and the suitability of the factor matrix were tested before the factor analysis, which was conducted to test the suitability of the original structure of the PMSEQ to the Turkish sample. KMO for data analysis. For the data to be appropriate for factor analysis, KMO is higher than 0.60 and the calculated Chi-square value of Bartlett's test is statistically significant.[22,28] As a result of the first-factor analysis developed by Macindo et al.,[4] it was reported that the KMO value was 0.91, and Bartlett's sphericity test was found to be statistically significant (p=0.001). In this study, the suitability of the data for factor analysis was evaluated using the KMO coefficient and Bartlett's sphericity test. The results showed that the data were suitable for fac-

tor analysis. Therefore, the fit of the original structure could be tested by confirmatory factor analysis.
Construct validity is used to evaluate whether a measurement tool aiming at measuring behavior, dimension and abstract concept, which cannot be directly observed and which is difficult to measure, has achieved its purpose and how accurately it is measured.[22] Factor analysis is the process of obtaining factors by calculating the relationships between multiple interrelated variables and grouping the variables that measure the same dimension.[25,29] In factor analysis, the aim is to express a large number of items with fewer factors. Factor analysis is divided into two as exploratory and confirmatory factor analysis.[30] Macindo et al.[4] found items with a factor load of <0.30 as a result of the first-factor analysis in the study they developed the original scale and obtained a scale consisting of 21 items by subtracting these items. In this study, confirmatory factor analysis method was used for construct validity, and as a result of the analysis, it was found that factor loadings of the items were over 0.30 separately in all samples, nursing students and nurses. Besides, the goodness of fit indices of a scale's confirmatory factor analysis should be at the desired level.[22] The goodness of fit indices was found to be acceptable in all three sample groups. This finding suggests that the original structure of the scale is sufficiently compatible.

RMSEA, is the square root of the mean of squares of error, and the RMSEA is expected to be 0.05 or less for the model to be significant.[31] If the RMSEA value is ≤0.05, good fit, between 0.05 and 0.08, adequate fit, between 0.08 and 1 "acceptable" fit, and >1. It is an indicator of unacceptable compliance.[32] In this study, RMSEA values <1 indicate an acceptable fit.

Reliability is used to see whether the expressions constituting the measurement tool show consistency among themselves.[25] Internal consistency analysis, time invariance, and item analysis methods are frequently used to determine the reliability of a scale.[33] In this study, Cronbach's alpha coefficient, item-total corrected correlation, and test-retest analyzes were preferred. Macindo et al.[4] reported that the Cronbach alpha coefficient of the scale was 0.963. In this study, in which the Turkish version of the scale was evaluated, the Cronbach's alpha coefficient of the PMSEQTR was 0.90. Therefore, it can be said that the measurements obtained from the scale are reliable. However, alpha in the S-PMSE subscale was found to be 0.61. Therefore, it is recommended to consider this constraint when evaluating the analysis results.

The correlation value is expected to be positive and high in item-total score correlation analysis, which explains the relationship between the scores obtained from the items in the scale and the total score of the scale. When the item-total score correlation value of an item is high, it means that the relation of the item with the desired quality is high.[28] Although there are different limits for the minimum correlation value in the literature, it is generally considered appropriate if it is over 0.30.[34] It was reported that item-total correlations in PMSEQ ranged from 0.667 to 0.857.[4] Although the results obtained in this study were lower than the original version of the scale, it was not lower than the lower limit that is acceptable in the literature, so no item elimination was necessary.

One of the analyses conducted to test the reliability of the scale is test-retest reliability. Test-retest reliability shows the consistency and invariance of a measuring instrument over time. It is recommended that the time between the implementation in test-retest should be long enough due to the possibility of the participants remembering the test content.[35,36] In the test-retest analysis, the correlation coefficient of the scale scores obtained in two specific time periods in the same sample determines how stable the test yields over time.[22] According to the results obtained by applying PMSEQTR to a group of 60 nurses consisting of 30 nursing students and 30 nurses at intervals of 15 days, there was no significant difference between the measurements and the relationship was very high. This result shows that the results obtained from the Turkish version of the scale do not change over time.

Limitations

The study was conducted with nurses working in two hospitals and nursing students studying in a single university. The scale should be tested in different samples.

Conclusion

The study revealed that PMSEQTR could be used by clinical nurses and nursing students as a valid

and reliable scale in assessing self-efficacy in pain management. Since there is no measurement tool to measure the level of self-efficacy in pain management in our country, it is thought that the use of this scale will contribute to the assessment of self-efficacy levels of the nurses in pain management and will enable new researches in different institutions and nurse populations in our country. The validity and reliability of the PMSEQ, which is a valid and reliable tool in the Turkish sample, can also be recommended for use in different countries by performing its validity and reliability studies.

Acknowledgements: We would like to thank native speaker for its support in correcting the English language.

Conflict-of-interest issues regarding the authorship or article: None declared.

Peer-rewiew: Externally peer-reviewed.

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