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ORIGINAL ARTICLE

Emergency Medical Technician Professional Competence Perception Scale: Validity and Reliability Study

Acil Tıp Teknikeri Mesleki Yeterlik Algı Ölçeği: Geçerlik ve Güvenirlik Çalışması

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ABSTRACT

The objective of this study was to develop a reliable and valid instrument to assess the professional competence of emergency medical technicians. The research sampling consists of 820 students who were in their last year of the First and Emergency Aid Program. The tools utilized for data collection included a Demographic Information Form, the Emergency Medical Technician Professional Competence Perception Scale (EMT-PCPS), and the Self-Efficacy-Competence Scale. To test the validity of the measuring tool's structure, exploratory factor analysis (EFA), item analysis and confirmatory factor analysis (CFA) were used. Cronbach Alpha coefficients and test-retest results have been examined for reliability testing. According to the validity test results, the 4-factor structure of EMT-PCPS explains 70.45% of the total variance. According to the reliability analysis results, the item-total test correlation values were greater than .30, the Cronbach's alpha coefficient was .97, and the correlation values between test-retest scores were medium to good ($p<.01$). The research found that the EMT-PCPS is a valid and reliable measuring instrument for analyzing the professional competence perception levels of Emergency Medical Technicians who are candidates to keep working in the profession.

Keywords: Emergency medicine technician; Professional competence perception; Scale development

ÖZ

Araştırmada, Acil Tıp Teknikerlerinin mesleki yeterlik algılarını inceleyebilmek amacıyla geçerli ve güvenilir bir ölçüm aracının geliştirilmesi amaçlanmıştır. Araştırmanın örneklemini İlk ve Acil Yardım Programı son sınıfta öğrenim gören toplam 820 öğrenci oluşturmaktadır. Verilerin toplanmasında, Demografik Bilgi Formu, Acil Tıp Teknikeri Mesleki Yeterlik Algı Ölçeği (ATT-MYAÖ) ve Öz-Etkililik-Yeterlik Ölçeği kullanılmıştır. Ölçme aracının yapı geçerliğini sınamak için Açıklayıcı Faktör Analizi (AFA), Madde Analizi ve Doğrulayıcı Faktör Analizi (DFA) uygulanmıştır. Güvenirlik sınamaları için Cronbach Alpha katsayısı ve test-tekrar test bulguları incelenmiştir. Geçerlik sınamalarında elde edilen bulgulara göre; ATT-MYAÖ'nün 4 faktörlü yapısı, toplam varyansın %70.45'ini açıklamaktadır. Güvenirlik analizleri bulgularına göre ise Madde-toplam test korelasyon değerlerinin .30 üzerinde, Cronbach alfa katsayısının .97 ve test-tekrar test puanları arasındaki korelasyon değerlerinin orta ve iyi düzeyde olduğu tespit edilmiştir ($p<.01$). Araştırma sonucunda, ATT-MYAÖ'nin, mesleği sürdürmeye aday Acil Tıp Teknikerlerinin mesleki yeterlik algı düzeylerini incelemede geçerli ve güvenilir bir ölçüm aracı olduğu belirlenmiştir.

Anahtar Sözcükler: Acil tıp teknikeri; Mesleki yeterlik algısı; Ölçek geliştirme

Introduction

In many countries, emergency health services are given in order to reduce the patient's or injured person's mortality, disease, and social consequences in the event of a sudden illness or accidental injury. When emergency medical intervention is required, healthcare professionals must instigate swift and accurate responses. Consequently, those involved in the delivery of emergency health services should have specialized training in emergency care and treatment. As the proportion of Emergency Medical Technicians working in the pre-hospital area and hospital emergency services in emergency health services has led to an increase in their roles and responsibilities parellel to the development of medicine, and the level of clinical competence expected from Emergency Medical Technicians has also increased. Therefore, practicing and aspirant EMTs must possess requisite skills and competencies, as well as an adequate belief in their abilities to perform potential life-saving procedures in order to succeed in their profession and fulfill their professional obligations (1). "Competence" is described (2) as "the state of being sufficient, the specialist knowledge providing the power to perform a job, competence, and the ability to fulfill one's duty. " Self-efficacy is explained by Bandura as an individual's assessment of their own perceived ability in a specific field (context), emphasizing that the belief system of efficacy is not a global trait, but a set of distinct self-beliefs related to diverse functional areas (3,4). In the literature, research on competence focuses on the concept of self-efficacy and there appears to be relationship between academic success, psychological

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well-being, problem solving, clinical competence, clinical performance and self-efficacy and the concept of self-efficacy being the subject of research across different fields (such as health, psychology, education) (5-9).

Research exploring the self-efficacy levels of students in the First and Emergency Aid Program have identified a correlation between the students' application of theoretical knowledge in practice and their competence perceptions, with these perceptions differing based on whether they were practicing or not (10,11). In the literature, studies examining the self-efficacy of EMTs and the relationship between self-efficacy and various factors generally adopt assessment tools prepared as task-specific checklists. However, there is no valid and reliable measurement tool available to examine perceptions of professional competence, which includes a comprehensive view of roles, authorities, and responsibilities (12-15).

This study, therefore, aimed to develop a measurement instrument to examine the perception of professional competence levels among EMTs.

Method

Study Group and Research Model

This methodological and descriptive study was conducted on a sample of 820 students in their final year at the Health Services Vocational School First and Emergency Aid Program during the spring semester of the 2021-2022 academic year. Information regarding the sampling process is shown in Figure 1.

Data Collection Tools

We employed the Demographic Information Form, the Emergency Medical Technician Professional Competence Perception Scale (EMT-PCPS), and the Self-Efficacy-Competence Scale to collect the data.

Emergency Medical Technician Professional Competence Perception Scale (EMT-PCPS)

The researcher devised a study aimed at investigating the professional competence perceptions of emergency medical technicians. In the light of the scope of the research, statements related to these perceptions were defined, informed by the duties, authorities, and responsibilities outlined in the regulation and supported by a thorough examination of pertinent literature. This led to the creation of an item pool (10-11; 16-21). Field experts evaluated the assembled item pool via face-to-face interviews, which culminated in a 119-item draft scale form. This form was then submitted to 15 experts from the fields of Health Sciences and Educational Sciences for evaluation of its language and content validity. A 3-point scale (1 - Inappropriate, remove the item; 2 - Somewhat appropriate, modify as suggested; 3 - Appropriate, use as is) was used to gather expert opinions.

The Lawshe Technique was applied to evaluate the expert opinions. Post-evaluation, 7 items with negative Content Validity Ratio (CVR) values were eliminated from the draft scale. To ascertain the significance of the positive CVR value items, the minimum CVR values at a=.05 level of significance were compared with the table values of the Content Validity Criterion (CVR) proposed by Ayre and Scally (2014) (CVR critical value =.60 for 15 experts). Following this comparison, 5 items that fell below the critical value were removed from the draft scale (22). The Content Validity Index (CVI) for the entire scale was calculated by averaging the CVI values of the remaining 107 items, resulting in a CVI of .93, which surpasses the set benchmark of .60 (CVI>CVI), indicating that the content validity of the draft scale was statistically significant. In line with the opinions of the Turkish Language Expert and field experts, the draft scale form, in which 21 items were revised to increase comprehensibility in terms of language and expression and comprising solely of positive statements, was converted into 7-point Likert type ((1) Strongly disagree.... (4) Undecided/No opinion.... (7) Strongly agree). This revised form consist of 107 items.

To assess the comprehensibility of the draft scale items, their ability to express the same meaning consistently across all participants, and the duration of the application, a pilot study was conducted with 36 students who were not included in the sample. The pilot study resulted in the removal of 29 items due to their lengthy implementation time and similarity in expression with other items on the scale. This decision was informed by the feedback of 6 initial evaluators and 2 field experts. Certain items were also reformulated as separate items as they questioned different skill levels of competence perception. Two new items concerning "normal newborn care and emergency care in birth complications" were added to the draft scale, and certain items were revised for better comprehensibility.

The revised scale, with a recalculated CVI of .94, demonstrated statistically significant content validity (CVI=.94>CVI=.75). The psychometric evaluation of the draft scale was then conducted on 81 items in a larger sample group.

Self-Efficacy-Competence Scale

The criterion validity of the EMT-PCPS scores was examined by implementing the Self-Efficacy-Competence Scale, a 5-point Likert-type scale adapted into Turkish by Gözüm and Aksayan (1999). This scale, consisting of 4 sub-dimensions and 23 items, scored 14 items in the opposite direction, with the total scale scores varying between 23 and 115. An increase in total score signifies a high level of an individual's self-efficacy-competence perception (23). The Cronbach's alpha value of the scale in this study was found as .85.

Data Analysis

IBM SPSS Statistics 26.0 and AMOS 24.0 licensed software were utilized to analyze the research data. Exploratory Factor Analysis (EFA), Confirmatory Factor

Analysis (CFA), and item analysis were used in the study to examine the construct validity of the scale. Pearson correlation analysis was utilized to test the criterion validity of the scale. The Cronbach Alpha internal consistency coefficient was calculated as part of the reliability studies, the test-retest method was employed to test the scale's stability, and the link between the two applications was examined using the Intraclass Correlation Coefficient (ICC).

Ethics of the Study

Ethics committee approval (dated 31.12.2021, numbered 2021/1087, and dated 30.12.2022, numbered 2022/1210) was obtained from Ondokuz Mayıs University Social and Human Sciences Research Ethics Committee. Research permissions were also procured from the institutions where the research was carried out, and permission was secured to use the Self-Efficacy-Competence Scale. The purpose of the research was explained to the senior students of the First and Emergency Aid Program, ensuring that the research data would not be used for any other purpose, and verbal and written consents were obtained from the students.

Results

This section presents the findings of the statistical analysis conducted to ascertain the validity and reliability of the EMT-PCPS.

Construct Validity

Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) were carried out to assess the construct validity of the measures obtained from the EMT-PCPS.

The appropriateness of EFA was evaluated by the Kaiser-Meyer-Olkin (KMO) coefficient and Bartlett's Sphericity test (n=400). The KMO value, which indicates the suitability of the sample size and the correlation between the items for factor analysis, is deemed sufficient when it is .60 and above, and excellent when it is .90 and above (24). In this study, the KMO sample suitability value was .98. Bartlett's Test of Sphericity was employed to test the assumption of the similarity of the correlation matrix (25). The chi-square test statistic was significant [$\chi2=31508.30$, $p<.001$)], indicating the data stemmed from a multivariate normal distribution. These findings demonstrate that the study data are appropriate for factor analysis.

Exploratory Factor Analysis (EFA)

EFA was undertaken using data acquired from 400 participants. To determine the factor structure of the draft scale, a principal component analysis with Varimax rotation was utilized. The acceptable loading level for the scale items was established as above .40 (26).

During the first stage, it was discerned that the draft scale was consolidated under 4 factors, accounting for 69.44% of the total variance. Post-EFA, there were no items with factor loadings below .40, but 9 items with loadings close to multiple factors (below 10%) were eliminated from the draft scale.

In the second stage, with the application of EFA and Varimax rotation on the 72-item version of the scale, the draft scale was seen to congregate under 4 factors, explaining 70.07% of the total variance. Here, 4 items with loadings close to multiple factors were discarded from the draft scale.

Subsequently, in the third stage, the 68-item version of the scale underwent EFA and Varimax rotation. The result indicated that the draft scale was assembled under 4 factors, explaining 70.31% of the total variance, and 2 items with loadings close to multiple factors were purged from the draft scale.

In the fourth and final stage, when EFA and Varimax rotation were applied to the 66-item version of the scale, no items displayed a factor loading below .40 or loadings close to multiple factors.

Thus, it was found that the 66 items in the scale were divided into 4 sub-dimensions, which expounded 70.45% of the total variance. The factor loadings ranged between .46 and .79. Additionally, no items with an anti-image correlation value below .50 were detected in the draft scale form. The factor weights related to the exploratory factor analysis of the EMT-PCPS are delineated in Table 1.

Table 2 discloses that the 4-factor structure elucidated 70.45% of the total variance of the draft scale. The eigenvalues for each sub-dimension were observed as Factor 1: 15.37, Factor 2: 11.72, Factor 3: 11.70, Factor 4: 7.71, respectively. Upon analyzing the content of the items collated under these factors, the dimensions were christened as "Professional Role and Responsibility (Factor 1)", "Patient/Injured Handling and Equipment Use (Factor 2)", "Clinical Decision Making and Practice (Factor 3)", and "Patient/Injured Assessment (Factor 4)".

Confirmatory Factor Analysis (CFA)

The construct validity of the draft scale was examined via a CFA utilizing data from 356 participants, with the intention to validate the structure developed by EFA. Post-CFA, 'item 8', which had a standardized factor loading below .40, was eliminated from the scale and CFA was re-conducted with 65 items. The standardized factor loadings of the items constituting the four sub-dimensions of the EMT-PCPS, resulting from the repeated CFA, are illustrated in Table 3.

To verify the model obtained via CFA, fit criteria (comprising of goodness of fit indices and corrected Chi-square (κ^2/df) value) were computed for the factors present in the model (Table 4). Upon examining the model results in Table 4, the RMSEA fit criterion is .05, indicating an acceptable fit. The additional fit criteria, IFI and SRMR, also signify an acceptable fit. The acceptable fit of the fit criteria, along with the good fit of the adjusted chi-square value, demonstrates that our data exhibit an acceptable fit. Consequently, our model is statistically significant and valid ($p=.001$; $p<.01$).

Analyzing the correlations between the factor scores

in Table 5 reveals a positive, moderate, and strong relationship between the factors, which is statistically significant (p=.001; p<.01). Furthermore, the correlation coefficients of the four factors in the scale with each other were found to exceed .30.

Item Analyses

Item analyses were avaluated with the data of 356 participants in the CFA group, by calculating the item-total test correlation and comparing the 27% lower-upper groups.

In the study, item-total test correlation values ranged from 0.44 to 0.75, and t values in t-test findings indicating the significance of the difference between the item scores of the upper 27% and lower 27% groups ranged from 5.655 to 14.557 (p<.01). Additionally, when examining the Cronbach's alpha values upon deletion of the item, it was discerned that the exclusion of any item from the factor would not enhance reliability.

Criterion Dependent Validity

In addition to the previously summarized structural evidence of the EMT-PCPS, the correlation coefficient between the scale and the Self-Efficacy-Competence Scale was calculated for criterion validity (n=356). It was found that there was a statistically significantly positive, weak, and very weak correlation between the participants' scores on the total Self-Efficacy-Competence Scale and their scores on the EMT-PCPS subscales and the total scale (Table 6).

Internal Consistency Reliability

To provide evidence for the reliability of the measurement tool, Cronbach's alpha internal consistency coefficient for the overall scale and its sub-dimensions was calculated with the data of the participants in the CFA group (n=356) (Table 7).

When Cronbach's alpha values are examined in Table 7, it is .95 for Professional Role and Responsibility sub-dimension; .96 for the Patient/Injured Transportation and Equipment Use sub-dimension; .94 for Clinical Decision Making and Practice sub-dimension; and .92 for Patient/Injured Assessment sub-dimension. Cronbach's alpha value for the total EMT-PCPS was .97.

Test-Retest Reliability

The temporal stability of the EMT-PCPS was evaluated by examining the relationship between the scores obtained from the initial and subsequent administrations using the intra-class correlation coefficient (ICC) (Table 8).

Upon investigating the ICC levels between the scores obtained by the participants in the test-retest from the EMT-PCPS sub-dimensions and the total scale (as presented in Table 8), a statistically moderate to good level of agreement was discerned (ICC=.60, .67, .54, .63, .75; p<.01). Moreover, a dependent sample t-test was employed to determine if there was a disparity between the mean scores derived from the first and second administrations. It was observed that the change in participants' EMT-PCPS sub-dimension and total scale scores did not present a statistically significant difference (p>.05).

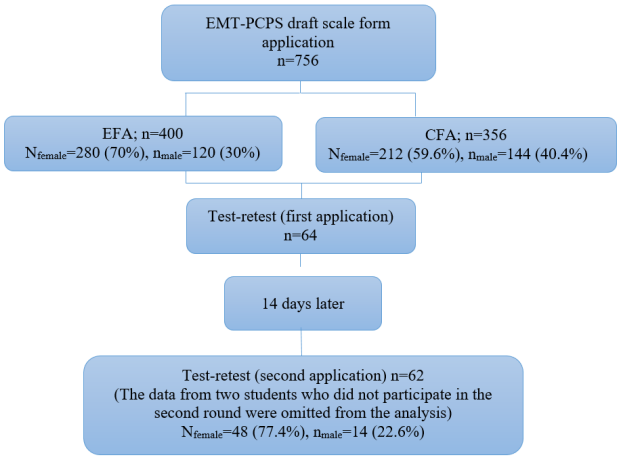

Figure 1. Study Group and Research Model

Table 1. Factor loading values as a result of exploratory factor analysis of EMT-PCPS (n=400)

Factor	EMT-	Standardized Factor Load	Factor	EMT-	Standardized Factor Load
Factor 1	PCPS16	.72	Factor 2	PCPS74	.75
	PCPS19	.72		PCPS76	.74
	PCPS5	.72		PCPS77	.73
	PCPS18	.72		PCPS78	.73
	PCPS17	.71		PCPS75	.72
	PCPS9	.71		PCPS71	.72
	PCPS3	.71		PCPS73	.71
	PCPS13	.71		PCPS72	.70
	PCPS22	.71		PCPS70	.70
	PCPS15	.70		PCPS79	.69
	PCPS2	.70		PCPS80	.66
	PCPS21	.69		PCPS81	.62
	PCPS14	.69		PCPS66	.59
	PCPS20	.68		PCPS68	.59
	PCPS7	.68		PCPS67	.59
	PCPS12	.66		PCPS65	.58
	PCPS6	.64	Factor 3	PCPS55	.79
	PCPS11	.64		PCPS50	.78
	PCPS1	.63		PCPS62	.74
	PCPS4	.62		PCPS54	.73
	PCPS10	.58		PCPS60	.73
	PCPS8	.46		PCPS48	.72
Factor 4	PCPS44	.65		PCPS63	.71
	PCPS30	.64		PCPS49	.70
	PCPS43	.63		PCPS61	.69
	PCPS28	.62		PCPS42	.69
	PCPS33	.62		PCPS52	.63
	PCPS32	.60		PCPS53	.61
	PCPS29	.60		PCPS46	.57
	PCPS31	.60		PCPS47	.57
	PCPS27	.56		PCPS35	.54
	PCPS26	.51		PCPS39	.53
				PCPS45	.52
				PCPS34	.51

EMT-PCPS: Emergency Medical Technician Professional Competence Perception Scale.

Table 2. Eigenvalues and explained variance results of EMT-PCPS factor analysis (n=400)

	Eigenvalues	Variance %	Total Variance %
Factor 1	15.37	23.29	23.29
Factor 2	11.72	17.75	41.04
Factor 3	11.70	17.73	58.77
Factor 4	7.71	11.68	70.45

EMT-PCPS: Emergency Medical Technician Professional Competence Perception Scale.

Table 3. Factor loading values as a result of confirmatory factor analysis of EMT-PCPS (n=356)

Factor	EMT-	Standardized Factor Load	Factor	EMT-	Standardized Factor Load
Factor 1	PCPS22 (21)	.78	Factor 2	PCPS65 (50)	.72
	PCPS21 (20)	.75		PCPS66 (51)	.76
	PCPS20 (19)	.75		PCPS67 (52)	.75
	PCPS19 (18)	.83		PCPS68 (53)	.79
	PCPS18 (17)	.78		PCPS70 (54)	.78
	PCPS17 (16)	.63		PCPS71 (55)	.87
	PCPS16 (15)	.67		PCPS72 (56)	.85
	PCPS15 (14)	.74		PCPS73 (57)	.84
	PCPS14 (13)	.75		PCPS74 (58)	.82
	PCPS13 (12)	.72		PCPS75 (59)	.85
	PCPS12 (11)	.67		PCPS76 (60)	.83
	PCPS11 (10)	.60		PCPS77 (61)	.78
	PCPS10 (9)	.49		PCPS78 (62)	.82
	PCPS9 (8)	.66		PCPS79 (63)	.74
	PCPS7	.67		PCPS80 (64)	.73
	PCPS6	.66		PCPS81 (65)	.73
	PCPS5	.73	Factor 3	PCPS34 (32)	.64
	PCPS4	.54		PCPS35 (33)	.61
	PCPS3	.67		PCPS39 (34)	.65
	PCPS2	.58		PCPS42 (35)	.68
	PCPS1	.58		PCPS45 (36)	.71
Factor 4	PCPS26 (22)	.72		PCPS46 (37)	.72
	PCPS27 (23)	.65		PCPS47 (38)	.69
	PCPS28 (24)	.80		PCPS48 (39)	.75
	PCPS29 (25)	.88		PCPS49 (40)	.74
	PCPS30 (26)	.86		PCPS50 (41)	.65
	PCPS31 (27)	.82		PCPS52 (42)	.69
	PCPS32 (28)	.77		PCPS53 (43)	.73
	PCPS33 (29)	.68		PCPS54 (44)	.75
	PCPS43 (30)	.53		PCPS55 (45)	.74
	PCPS44 (31)	.65		PCPS60 (46)	.67
				PCPS61 (47)	.66
				PCPS62 (48)	.61
				PCPS63 (49)	.61

EMT-PCPS: Emergency Medical Technician Professional Competence Perception Scale.

***** As a result of CFA, revised item numbers are shown in ( ).

Table 4. Confirmatory factor analysis model data fit indices of EMT-PCPS (n=356)

Fit Indices	Good Fit	Acceptable Fit	The Results of Model	
RMSEA	0<RMSEA<.05	.05≤ RMSEA ≤.10	.05	Acceptable fit
NFI	.95≤ NFI ≤1	.90≤ NFI ≤.95	.82	
NNFI	.97≤ NNF ≤1	.95≤ NNFI ≤.97	.89	
CFI	.97≤ CFI ≤1	.95≤ CFI ≤.97	.90	
IFI	.95≤ IFI ≤1	.90≤ IFI ≤.95	.90	Acceptable fit
RFI	.90≤ RFI ≤1	.85≤ RFI ≤.90	.81	
SRMR	0≤ SRMR ≤.05	.05≤ SRMR ≤.10	.07	Acceptable fit
GFI	.95 ≤GFI ≤1	.90≤ GFI ≤.95	.75	
AGFI	.90≤ AGFI ≤1	.85≤ AGFI ≤.90	.73	
κ^2 /df (3863.059/1938)	0 ≤ κ^2/df ≤ 3	3 ≤ κ^2/df ≤ 5	1.99	Good fit

Table 5. Relationship between EMT-PCPS factors

		Factor 1	**Factor 2**	**Factor 3**	**Factor 4**
Factor 1 (Professional role and responsibility)	r		.65	.55	.74
	p		.001**	.001**	.001**
Factor 2 (Patient/ Injured handling and Equipment use)	r	.65		.66	.66
	p	.001**		.001**	.001**
Factor 3 (Clinical decision making and practice)	r	.55	.66		.54
	p	.001**	.001**		.001**
Factor 4 (Patient/ Injured assessment)	r	.74	.66	.54	
	p	.001**	.001**	.001**	

r: Pearson Correlation Test

**p<.01

Table 6. The relationship between EMT-PCPS and Self-Efficacy-Competence Scale (n=356)

Emergency Medical Technician Professional Competence Perception Scale						
		Factor 1	Factor 2	Factor 3	Factor 4	Total Score
Self-Efficacy-Competence Scale **Total Score**	r	.28	.27	.14	.26	.27
	p	.001**	.001**	.001**	.001**	.001**

r: Pearson Correlation Test

**p<.01

Table 7. Distribution of EMT-PCPS internal consistency values (n=356)

EMT-PCPS	Number of Items	Cronbach Alpha
Professional Role and Responsibility	21	.95
Patient/Injured Handling and Equipment Use	16	.96
Clinical Decision Making and Practice	18	.94
Patient/Injured Assessment	10	.92
Total	65	.97

Table 8. Intra-class correlation coefficients between EMT-PCPS test-retest scores and their significance (n=62)

EMT-PCPS	Test Mean±SD	Retest Mean±SD	ICC	%95CI	p
Professional Role and Responsibility	6.21±0.58	6.09±0.71	.60	.41-.74	.001**
Patient/Injured Handling and Equipment Use	6.08±0.92	6.21±0.79	.67	.51-.79	.001**
Clinical Decision Making and Practice	5.61±0.90	5.79±0.85	.54	.34-.69	.001**
Patient/Injured Assessment	6.50±0.63	6.25±0.71	.63	.45-.76	.001**
Total Score	6.10±0.63	6.08±0.67	.75	.62-.84	.001**

EMT-PCPS: Emergency Medical Technician Professional Competence Perception Scale.

ICC: Interclass Coefficient Correlation

**p<.01

Discussion

The purpose of this study was to create a measurement instrument to assess the professional competence perception levels of Emergency Medical Technicians. Validity and reliability analyses were carried out for this objective. As a result of EFA conducted to reveal the factor structure within the scope of the validity studies of the scale, EMT-PCPS showed a 4-factor structure ("Professional Role and Responsibility", "Patient/ Injured Transport and Equipment Use", "Clinical Decision Making and Practice" and " Patient/Injured Assessment") and was found to explain 70.45% of the total variance. The factor loadings of the items range from .46 to .79. the explaining more than 50% of the total variation of the measuring instrument is an important criterion (27). However, item loadings greater than .30 are advised as another criterion to be taken into consideration for validity (28). The results of EFA demonstrate that EMT-PCPS fits these requirements.

The verification of the factor structure of the EMT-PCPS indicated by EFA on the data set was tested with CFA. The factor loadings acquired as a consequence of CFA can be considered to represent substantial effect sizes. The research fit criteria are among the fit indices used to evaluate model fit in Structural Equation Model (SEM) research (29). The data set appears to have a decent and acceptable fit to the model based on the reported fit criteria (30,31). The four-factor structure of the EMT-PCPS was validated based on CFA findings and specified fit criteria. The values associated with the correlation coefficients of the four factors corroborate the conclusion obtained for the factor structure of the scale items. Furthermore, item analysis findings based on upper-lower group averages reveal that the scale's items have a high degree of distinctiveness, and item-total test correlation findings show that each item is connected to and compatible with the complete scale.

The association between EMT-PCPS and the Self-Efficacy-Competence Scale was examined in the study within the context of criterion validity. According to Bandura (1986), self-efficacy belief is the process by which a person organizes and exhibits the behaviors required to execute a job or activity. The most important source of information utilized in the evaluation process is evaluations of performance success. As a result, it is hypothesized that there would be a link between professional competence perception and self-efficacy. According to these theoretical foundations, it has been determined that the two scales have a positive significant association within the context of criterion validity. The results suggest that the EMT-PCPS provides criterion validity.

When the study's reliability findings are analyzed, the EMT-PCPS Cronbach alpha reliability coefficient values range between .92 and .96 in the sub-dimensions and are .97 for the overall scale. The measuring tool's internal consistency coefficient is expected to be .70 or higher. The EMT-PCPS items can be regarded to be homogenous within themselves and capable of measuring the concept they are designed to test. Furthermore, test-retest results show that the scale is invariant over time.

The results of the validity and reliability analyses indicate that the Emergency Medical Technician Professional Competence Perception Scale can accurately measure the specified traits, without confusion with other traits, and can execute sensitive and consistent measurements across multiple assessments.

Limitations

This study was confined to final-year students in the First and Emergency Aid Program at the Vocational School of Health Services during the spring semester of the 2021-2022 academic year, and who consented to participate in the study.

Conclusion and Recommendations

Given the results of the validity and reliability findings, this measurement tool can be regarded as a valid and reliable instrument for examining the professional competence perceptions of prospective emergency medical technicians.

The "EMT-PCPS" consists of 65 items spread across the sub-dimensions of "Professional Role and Responsibility, Patient/Injured Transportation and Equipment Use, Clinical Decision Making and Practice, and Patient/ Injured Assessment". In terms of scoring, both total scores and subscale scores can be obtained for each individual, with higher scores reflecting a commendable level of professional competence perception.

EMT-PCPS will serve as an assessment tool for exploring the professional competence perceptions of final year students of the First and Emergency Aid Program. It will assist in identifying training needs to devise strategies for boosting student success and facilitating learning in the teaching process and will contribute to the development and adaptation of similar scales. In addition, it is suggested that the use of the developed scale in determining the perceptions of professional competence of emergency medical technicians

who continue the profession and emergency medical technicians who have completed all module training specified in the regulation will make significant contributions to the measurement power.

Conflict of Interest Statement

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