Araştırma Makalesi
(Research Article)

EGEHFD, 2024, 40 (3): 345-355
Doi: 10.53490/egehemsire.1267451

Yoksunluk Değerlendirme Aracı-1 Türkçe Geçerlik ve Güvenilirlik Çalışması

Turkish Validity and Reliability Study of The Deprivation Assessment Tool-1

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Gönderilme Tarihi: 18 Mart 2023 **Kabul Tarihi:** 22 Şubat 2024

*Bu çalışma, 13.01.2022 kabul tarihinde "Yoksunluk değerlendirme aracı-1 (YDA-1)'in Türkçe geçerlik güvenirlik çalışması" adı ile İstanbul Medipol Üniversitesi Sağlık Bilimleri Enstitüsü Hemşirelik Anabilim Dalı Yüksek Lisans tez çalışmasından üretilmiştir.

ABSTRACT

Objective: No Turkish adaptation of a measurement tool evaluating the withdrawal in sedated children was found in the literature. This situation raised the need for a measuring instrument in the literature that assesses the withdrawal of children in Turkey. This study aimed to determine the Turkish validity and reliability of the Withdrawal Assessment Tool-1.
Methods: It is a methodological study. The sample of the study consisted of 80 children, who were hospitalized in the 16-bed Pediatric Intensive Care Unit of a State hospital in Istanbul, who volunteered to participate in the study, and who had parental consent. The data were collected between 25.12.2020 and 22.08.2021, through "Descriptive Information Form", "Withdrawal Assessment Tool-1", "Pediatric Cerebral Performance Category Scale", and "Pediatric Overall Performance Category" and "PRISM score". The data obtained from the study were evaluated using SPSS 22.0 and MedCalc 19.1 statistical programs.
Results: A significant positive ($p=0.000<0.05$) correlation was found between the Withdrawal Assessment Tool-1 scores of the children in the sample group and the Pediatric Overall Performance Category and Pediatric Cerebral Performance Category Scale scores. There was a positive ($p=<0.05$) correlation between the Withdrawal Assessment Tool-1 of the children and the length of stay in the intensive care unit, ventilation time, cumulative opiate dose, the highest opiate dose, and the highest benzodiazepine dose. The optimum cut-off value of the scale was determined as >4. Cut-off point Sensitivity was 81.82; Specificity was 100; Youden index was $J=0.818$ ($0<J=0.818<1$). According to the Withdrawal Assessment Tool-1 cut-off point (4>), it was found that 56.2% of children developed withdrawal.
Conclusions: As a result of the findings, it was determined that the Withdrawal Assessment Tool-1 makes sensitive measurements to distinguish differences and is a valid and reliable tool in Turkish. In the light of these results, it is recommended to be used in clinical practice to determine the withdrawal in children using sedation.

Keywords: Child; withdrawal; assessment; validity; reliability.

ÖZ
Amaç: Literatürde sedasyon kullanılan çocukların yoksunluk durumunu değerlendiren bir ölçme aracının Türkçe uyarlaması bulunamamıştır. Bu durum Türkiye'de çocukların yoksunluk durumunu değerlendiren bir ölçme aracının literatüre dahil edilmesi ihtiyacını gündeme getirmiştir. Bu çalışma, Yoksunluk Değerlendirme Aracı-1'in Türkçe geçerlik güvenirliğini belirlemek amacıyla yapıldı.
Yöntem: Araştırma metodolojik tiptedir. Araştırmanın örneklemini İstanbul'da bulunan bir devlet hastanesinin 16 yataklı Çocuk Yoğun Bakım Ünitesinde yatmakta olan araştırmaya katılmaya gönüllü ve ebeveynlerinden onam alınan 80 çocuk oluşturdu. Veriler "Tanıtıcı Bilgiler Formu", ''Yoksunluk Değerlendirme Aracı-1'', "Pediatrik Serebral Performans Kategori Ölçeği", ''Pediatrik Genel Performans Kategorisi'' ve "PRİSİM skoru" ile 25.12.2020-22.08.2021 tarihleri arasında toplandı. Araştırmadan elde edilen veriler SPSS 22,0 ve MedCalc 19.1 istatistik program aracılığıyla değerlendirildi.
Bulgular: Örneklem grubundaki çocukların Yoksunluk Değerlendirme Aracı-1 puanları ile Pediatrik Genel Performans Kategorisi ve Pediatrik Serebral Performans Kategori Ölçeği puanları arasında pozitif ($p=0.000<0.05$) anlamlı ilişki olduğu saptandı. Çocukların Yoksunluk Değerlendirme Aracı-1 ile yoğun bakımda kalış süresi, ventilasyonda kalış süresi, kümülatif opiate dozu, en yüksek opiate dozu, en yüksek benzodiazepine dozu arasında pozitif ($p=<0.05$) korelasyon bulundu. Ölçeğin uygun değer kesim noktası (cutoffdeğeri)>4 olarak belirlendi. Kesme noktasındaki Sensitivity (Duyarlılık) 81.82; Specificity (Özgüllük) 100; Youdenindex $J=0.818$ ($0<J=0.818<1$) bulundu. Yoksunluk Değerlendirme Aracı-1 kesim noktasına (4>) göre çocukların %56.2' sinde yoksunluk geliştiği saptandı.
Sonuç: Elde edilen bulgular sonucunda Yoksunluk Değerlendirme Aracı-1'in farklılıkları ayırt edecek hassas ölçüm yaptığı ve Türkçe geçerli ve güvenilir bir araç olduğu saptandı. Bu sonuçlar ışığında aracın, sedasyon kullanılan çocuklara yönelik yoksunluk durumunun belirlenmesi amacı ile klinik uygulama alanında kullanılması önerilir.

Anahtar Sözcükler: Çocuk; yoksunluk; değerlendirme; geçerlik; güvenirlik.

How to cite: Soykök, R., Kökcü Doğan, A. (2024). *Turkish Validity and Reliability Study of The Deprivation Assessment Tool-1. JEUNF*, *40*(3), 345-355. Doi: 10.53490/egehemsire.1267451

Kaynak Gösterimi: Soykök, R., Kökcü Doğan, A. (2024) Yoksunluk Değerlendirme Aracı-1 Türkçe Geçerlik ve Güvenilirlik Çalışması. EGEHFD,40(3), 345-355. Doi: 10.53490/egehemsire.1267451

INTRODUCTION

The use of sedation and analgesics to alleviate pain and anxiety in procedures is widespread and is preferred by many specialists (Green et al., 2019). Most critically ill patients needing mechanical ventilation are prescribed opioids and benzodiazepines during their stay in intensive care. While recent studies promote minimal sedation, it is also established that patients are exposed to higher doses of opioids and benzodiazepines as their stay in intensive care increases (Burry et al., 2014; Sneyers et al., 2020). Sedation with opioids and benzodiazepines is applied to ensure comfort to the patient, relieve pain and anxiety, and avoid accidents of removing life-saving tubes and lines. However, using opioids and benzodiazepines for a prolonged period may induce tolerance, physical dependence, and the development of iatrogenic withdrawal syndrome (IWS) during the tapering phase (Dokken et al., 2021). IWS, a combination of autonomic dysfunction, central nervous system stimulation, and gastrointestinal symptoms, can manifest after abrupt cessation or sudden reduction of these drugs (Best, Wypij, Asaro, and Curley, 2017). Critically ill patients who take opioids and benzodiazepines at high doses or are exposed to both for more than 72 hours are at risk for IWS. IWS occurs in 7.5-100% of pediatric patients receiving opioids and benzodiazepine (Duceppe et al., 2019). Inadequate analgesia and sedation can lead to pain, pain-induced agitation, unplanned extubation due to agitation, or removal of angiocath devices. On the other hand, excessive use of these agents can lead to prolonged hospital and intensive care unit (ICU) stays, prolonged ventilation time, tolerance, and dependence. Iatrogenic withdrawal syndrome and delirium are identified as the side effect of prolonged analgesia and sedation (Da Silva, Reis, Fonseca, and Fonseca, 2016; Green et al., 2019; Sanavia, Mencía, Lafever, Solana, and Garcia, 2019).

To reduce the risk of tracheal extubation and withdrawal syndrome, which can complicate the healing process; it is necessary to reduce the dose of the drugs. In addition, iatrogenic withdrawal syndrome is characterized by gastrointestinal disorders, neurological and motor abnormalities, and autonomic dysfunction, which can occur after spontaneous cessation or rapid weaning in physically dependent patients. Recommendations for optimal sedation and analgesia in ill children and assessment methods for iatrogenic withdrawal syndrome continue to evolve as novel research emerges (Bowe et al., 2019).

However, when Turkish literature is examined, it is seen that this subject is not valued enough. It is thought that the availability of a Turkish evaluation tool on this subject plays an important role among the main reasons for this. In this study, the adaptation of the wıthdrawal assessment tool-1 to the Turkish language for use in health care services and the resulting Turkish version (T-WITHDRAWAL ASSESSMENT TOOL-1) were carried out to evaluate its reliability and validity T-WAT-1.

Research questions

In this study, the answer to the question "Is the Withdrawal Assessment Tool -1 (WAT-1) a Valid and Reliable Tool in Turkish?" was sought.

METHODS

Research Design

This study was carried out as a descriptive research.

Population and Sample

The study population consisted of children in the pediatric intensive care unit of a state hospital in Istanbul. The team has a total capacity of 16 beds and provides service with one faculty member, two minor specialists, two specialists, 36 nurses, one secretary, and 16 staff.

The sample consisted of 80 children aged between 2 weeks and 18 years who were hospitalized in the same unit and received opioid or benzodiazepine treatment and who had parental consent. Children exposed to continuous opioids and benzodiazepines infusions for more than five days or received regular opioid doses for 24 hours. Pediatric patients on mechanical ventilator support. Pediatric patients with Severe Cerebral Palsy. These patients were included because we could not measure their physical responses. The sample size is formed in scale studies by taking 5-10 times each scale item. In this study of "WAT-1," which consisted of 11 items and required at least 55 and at most 110 observations, 80 children with a rate of 72.7% were included.

Inclusion criteria

- Children aged between 2 weeks- 18 years,
- Children exposed to continuous opioids and benzodiazepines infusions for more than five days or received regular opioid doses for 24 hours.
- Pediatric patients on mechanical ventilator support.

Exclusion criteria

- Pediatric patients with Severe Cerebral Palsy.
- Pediatric patients who were exitus during the study (15 pediatric patients),

Data Collection

The data of the research were collected between 25.12.2020 and 22.08.2021. The Withdrawal Assessment Tool-1 (WAT-1) was uploaded to the meta-vision system of the hospital from which the application permission was obtained. Nurses working in the intensive care unit received training on using the Withdrawal Assessment Tool-1 (WAT-1) by watching a 20-minute online video, and their questions were answered. In addition, consent was obtained from the parents who volunteered for their children to participate in the study, and data from the children was collected. The assessment started immediately after the opioid and benzodiazepine tapering and continued until 72 hours after the treatment ended. A double evaluation was performed by the researcher and the nurse providing care twice a day, in the morning and evening, and the results were uploaded to the meta vision. Data collection time (10 min.) and assessment time (10 min.) took 20 minutes.

Cross-cultural adaptation of the WAT-1

The translation procedure was performed according to guidelines for cross-cultural methods in health research and practice (Pena ED, 2007. Sperber AD, 2004). The scale items were translated into Turkish by three lecturers working in the "Department of Foreign Languages" and a faculty member, an expert in the field. The final version of the scale items was created by selecting the most appropriate expressions from the Turkish translations and was translated back into English by a linguist whose primary language was Turkish and given detailed information on the subject. Finally, the scale items, finalized after the researcher made necessary corrections by selecting the most appropriate expressions from the Turkish translations, were submitted for expert opinion.

Data Collection Tools

The Study Data Were Collected Using The "Descriptive Information Form," Pediatric Cerebral Performance Category (PCPC), Pediatric Overall Performance Category (POPC), Pediatric Risk of Mortality (PRISM) and "Withdrawal Assessment Tool-1 (WAT-1)".

Descriptive information form: It consists of 7 questions about the child (sex, age group, diagnosis, length of stay in the intensive care unit, mechanical ventilation time, and sedations used).

The Pediatric Cerebral Performance Category (PCPC) Scale*:* PCPC scale was developed by Fisher in 1992 to measure morbidity efficiently and effectively after a child's critical illness or injury. PCPC focuses on cognitive impairment. It is associated with comprehensive and well-established psychometric measures of functioning. It consists of 6 categories, each of which is scored as one point. PCPC is assessed as (1) Normal, (2) Mild disability, (3) Moderate disability, (4) Severe disability, (5) Coma, (6) Brain death (Fiser, 1992; Volakli et al., 2015). No Turkish validity and reliability study of the PCPC scale was found in the literature. The scale was translated into Turkish by the researchers. The translations were reviewed by 3 experts who were fluent in both languages. After the reviews, the form was finalized and the Turkish translation version was created.

Pediatric Overall Performance Category (POPC) Scale: POPC scale was developed by Fisher in 1992 to evaluate morbidity efficiently and effectively after a child's critical illness or injury. POPC focuses on functional morbidity. It is associated with comprehensive and well-established psychometric measures of functioning. It consists of 6 categories, each of which is scored as one point. POPC is assessed as (1) Good Overall Performance, (2) Mild disability, (3) Moderate disability, (4) Severe overall disability, (5) Coma, (6) Brain death (Fiser 1992; Volakli et al., 2015). No Turkish validity and reliability study of the PCPC scale was found in the literature. The scale was translated into Turkish by the researchers. The translations were reviewed by 3 experts who were fluent in both languages. After the reviews, the form was finalized and the Turkish translation version was created.

Pediatric Risk of Mortality (PRISM) Score: The PRISM Score was developed from the Physiologic Stability Index (PSI), accepted as an indicator of disease severity in the United States first in 1988. The PRISM 3 score was established in 1996 by collecting data from 11,165 patients from 32 Pediatric Intensive Care Units in the United States. This scale assesses the risk of death among children admitted to the intensive care unit. The PRISM III score has 17 physiologic variables. *In the cardiovascular system and neurological system*: systolic blood pressure, heart rate, temperature, Glasgow coma score, and pupillary response are evaluated; *in acid-base balance*: pH, pCO2, pO2, and total CO2; *in biochemical tests*: serum glucose, potassium, calcium, creatinine, blood urea nitrogen; *in hematologic tests*: white blood cell count, platelet count, prothrombin time, and activated partial thromboplastin time. Children were examined under four age groups 0-1 month (neonate), 1-12 months (infant), 12-144 months (child), and >144 months (adolescent) (Pollack, Patel, and Ruttimann, 1996).

Withdrawal Assessment Tool-1 (WAT-1) was developed by Franck, Harris, Soetenga, Amling, and Curley in 2007. It is an 11-item scale. WAT-1 observation includes four steps. *The First;* gives information about watery/loose stools, any vomiting/retching/nausea, and temperature in the last 12 hours obtained from the patient data. *The Second*; is a 2-minute pre-stimulus observation on tremors, sweating, uncoordinated movement, and yawning/sneezing. *The Third*; is a 1-min stimulus observation on startle to touch and muscle tone. *Fourth*; is a 5-min post-stimulus observation to determine the time to regain a calm state? The minimum WAT-1 score is 0 points, and the maximum is 12 points (Franck, Harris, Soetenga, Amling, and Curley, 2008).

Data Analysis

Data analysis was conducted using SPSS 22.0 (IBM, Turkey) and MedCalc 19.1 statistical programs on a computer. Frequent and percentage analyses were used to determine the descriptive characteristics of the patients participating in the study. The mean and standard deviation statistics were used to analyze the scale.

In order to verify the content/scope validity of the form, the Turkish version of the form, adapted and prepared unanimously, was sent to the evaluation of an expert panel consisting of 10 experts (4 lecturers in the field of intensive care, 6 lecturers in the field of nursing). To verify the content validity of the form, Lawshe's (1975) content validity index (CVI) was calculated (Lawshe,1995). Correlation of patients' YDA-1 score and other continuous variables examined through analysis. Scale according to the descriptive characteristics of the patients t-test, one-way analysis of variance in examining the differences in levels (ANOVA) and post hoc (Tukey, LSD) analyzes were used. Lower upper 27% Discrimination according to groups was analyzed with t-test. YDA-1 scores of the children in the research group were divided into lower and upper 27% groups. It was determined that there was a significant difference ($t(42)=-18.472$; $p=0.000<0.05$). Top YDA-1 scores of the 27% group ($\bar{x}=7.182$) are higher than the YDA1 scores of the lower 27% group. ($\bar{x}=2.091$) was found to be high. According to these results, YDA-1 Scale can distinguish differences. It was determined that it made precise measurements. To determine the effect of YDA-1 score in predicting deprivation status roc analysis was applied.

Ethical Considerations

Permission was obtained from the author of the original measuring instrument for the Turkish adaptation and validity and reliability study of the Withdrawal Assessment Tool-1 (WAT-1). Furthermore, to conduct the study, approval was obtained from Istanbul Medipol University Non-Interventional Clinical Research Ethics Committee (Decision number: 10840098-772.02-E.58634 on 22 October 2020) and application permission from the hospital administration where the Helsinki Declaration conducted the research. In addition, the families of the children who met the criteria of the study group were informed about the research and its purpose, and their written consent was obtained.

RESULTS

It was found that 32.5% of the children in the sample group were female, 67.5% were male, 38.8% were breastfed babies, and 32.5% were toddlers. It was determined that 66.2% of the children were admitted to the intensive care unit and diagnosed with acute renal failure.

Dormicum was used in 96.2% of the children, ketamine in 2.5%, and fentanyl in 98.8%. It was found that before tapering, 46.2% of children received opiate for 1-2 days, 20.1% for 3-4 days, 22.5% for 5-6 days; 44.2% of the children received benzodiazepine for 1-2 days, 16.9% for 3-4 days, and 19.5% for 5-6 days. After tapering, 73.8% of children received opiates for 1-2 days, 8.6 % for 3-4 days, 5% for 5-6 days; 52.6% of the children received benzodiazepines for 1-2 days, 15.8% for 3-4 days, and 9.2% for 5-6 days (Table 1).

Table 1. Descriptive Characteristics (N=80)

Groups		Frequency (n)	Percentage (%)
Child sex	Female	26	32.5
	Male	**54**	**67.5**
Child age group	**Breastfed baby**	**31**	**38.8**
	Toddler	26	32.5
	Preschool	9	11.2
	School-age	10	12.5
	Adolescent	4	5.0
Child diagnosis	**Acute renal failure**	**53**	**66.2**
	Respiratory distress	5	6.3
	Dehydration	3	3.8
	Drowning	3	3.8
	Head trauma	1	1.2
	Meningitis	3	3.8
	Status	2	2.5
	Cardiac arrest	5	6.2
	Kidney failure	3	3.8
	Covid19	1	1.2
	Non-traffic auto accidents	1	1.2
Dormicum	**Yes**	**77**	**96.2**
	No	3	3.8
Ketamine	Yes	2	2.5
	No	**78**	**97.5**
Fentanyl	**Yes**	**79**	**98.8**
	No	1	1.2
Time before opiate tapering	**1-2 days**	**37**	**46.2**
	3-4 days	16	20.1
	5-6 days	18	22.5
	7-8 days	1	1.2
	9-10 days	4	5.0
	More than 10 days	4	5.0
Time before benzodiazepine tapering	**1-2 days**	**34**	**44.2**
	3-4 days	13	16.8
	5-6 days	15	19.5
	7-8 days	4	5.2
	9-10 days	4	5.2
	More than 10 days	7	9.1
Time after opiate tapering	**1-2 days**	**59**	**73.8**
	3-4 days	7	8.6
	5-6 days	4	5.0
	7-8 days	3	3.8

	9-10 days	7	8.8
Time after benzodiazepine tapering	**1-2 days**	**40**	**52.6**
	3-4 days	13	15.8
	5-6 days	7	9.2
	7-8 days	4	5.3
	9-10 days	7	9.2
	More than 10 days	6	7.9

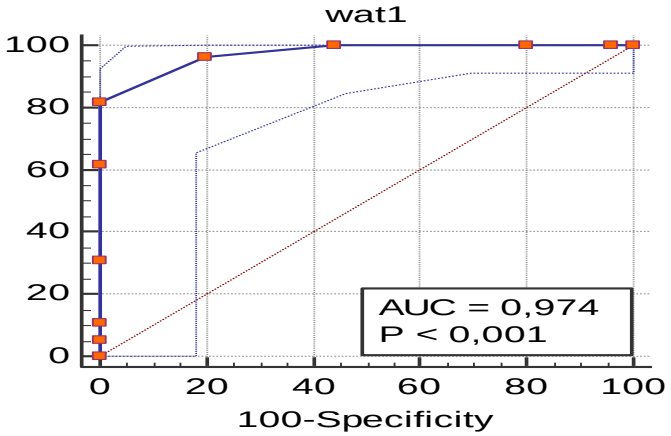
Findings on The Content Validity of the WAT-1

To assess the content validity of WAT-1, expert opinion was sought. For this purpose, the Turkish form of the scale, whose translation was completed, was submitted to 11 faculty members who were experts in their fields. The Content Validity Index (CVI) was used to assess expert opinion. According to this index, experts evaluated the items according to the following statements: Unsuitable (1 point), item needs amendments (2 points), Suitable, but should be slightly reviewed (3 points), and Very suitable (4 points). According to expert evaluations, the CVI of the items was found to be 0.934. The Turkish form was reorganized with expert recommendations, and a pilot study was conducted with 15 children not included in the sample. No amendments were made to the measuring instrument after the pilot study. WAT-1 scores of the patients and their relationships with other continuous variables were examined through correlation analyses. T-test, one-way analysis of variance (ANOVA), and post hoc (Tukey, LSD) analyses were used to assess the differences in scale levels according to the descriptive characteristics of the patients. The discrimination in the lower and upper 27% groups was analyzed with a t-test.

It was found that the WAT-1 scores of the children in the study group differed significantly according to the lower and upper 27% groups ($t(42)=-18{,}472$; $p= .000< .05$). The WAT-1 scores of the upper 27% group ($\bar{x}=7.182+0.958$) were higher than the WAT-1 scores of the lower 27% group ($\bar{x}=2.091+0.8.68$). According to these results, it was determined that the WAT-1 makes sensitive measurements to distinguish differences.

Roc Analysis According to WAT-1 Values

Roc analysis was performed to determine the effect of the WAT-1 score on predicting withdrawal status. The optimum cut-off value of the scale was determined as>4. The areas under the Roc curves were statistically significant ($p< .05$). Cut-off point Sensitivity was 81.82; Specificity was 100; Youden index was $J=0.818$ ($0<J=0.818<1$), (Figure 1), (Table 2-3). According to the WAT-1 cut-off point (4>), 56.2% (45) of the children in the sample group developed withdrawal, while 43.8% (35) did not; when assessed according to repeated sedation, 68.8% (55) developed withdrawal and 31.2% (25) did not.



Şekil 1. Roc curve

Table 2. The Significance of the Roc Curve

The area under the roc curve (AUC)	0.974
Standard error	0.013
95% confidence interval	0.911- 0.997
z value	37.801
p (Area=0.5)	<0.0001
Youden index J	0.818
Cut-off point	>4
Sensitivity	81.82
Specificity	100.00

TABLE 3. Sensitivity and Specificity Values

Criteria	Sensitivity	%95 CI	Specificity	%95 CI	+LR	%95 CI	-LR	% 95CI
≥0	100.00	93.5 – 100.0	0.00	0.0 –13.7	1.00	1.0 – 1.0		
>0	100.00	93.5 – 100.0	4.00	0.1 – 20.4	1.04	1.0 – 1.1	0.00	
>1	100.00	93.5 – 100.0	20.00	6.8 – 40.7	1.25	1.0 – 1.5	0.00	
>2	100.00	93.5 – 100.0	56.00	34.9 – 75.6	2.27	1.5 – 3.5	0.00	
>3	96.36	87.5 – 99.6	80.00	59.3 – 93.2	4.82	2.2 – 10.6	0.045	0.01-0.2
>4	81.82	69.1 – 90.9	100.00	86.3 – 100.0			0.18	0.1 – 0.3
>5	61.82	47.7 – 74.6	100.00	86.3 – 100.0			0.38	0.3 – 0.5
>6	30.91	19.1 – 44.8	100.00	86.3 – 100.0			0.69	0.6 – 0.8
>7	10.91	4.1 – 22.2	100.00	86.3 – 100.0			0.89	0.8 – 1.0
>8	5.45	1.1 – 15.1	100.00	86.3 – 100.0			0.95	0.9 – 1.0
>9	0.00	0.0 – 6.5	100.00	86.3 – 100.0			1.00	1.0 – 1.0

Findings on the Mean Scores

The mean "PCPC" of the children was 2.788±1.110 (Min=1.000, Max=4.000); the mean "POPC" was 2.788±1.110 (Min=1.000, Max=4.000); the mean "WAT-1" was 4.788±2.097 (Min=0.000, Max=9.000); the mean "PRISM score" was 23.354±25.700 (Min=1.000, Max=9.100). The mean "PRISM score" of the children in the study group was 23.354±25.700; the mean "length of stay in the intensive care unit" was 24.600±16.326 (Min=3.000, Max=74.000); the mean "ventilation time" was 9.463±7.439 (Min=1.000, Max=29.000); the mean "cumulative opiate dose" was 9476.760±19587.622 (Min=195.000, Max=147168.000); the mean "highest opiate dose" was 1.271±0.637 (Min=0.200, Max=4.000); the mean "cumulative benzodiazepine dose" was 2268.714±8598.497 (Min=14.600, Max=44424.000); the mean "highest benzodiazepine dose" was 0.171±0.124 (Min=0.050, Max=0.800).

Findings of Correlation Analysis

A significant positive difference was found between WAT-1 scores of the children in the study group and POPC, PCPC, length of stay in the intensive care unit, ventilation time, cumulative opiate dose, highest opiate dose, and highest benzodiazepine dose; a significant negative difference was found between WAT-1 scores and cumulative benzodiazepine dose scores (p> .05), (Table 4).

Table 4. Correlation Analysis Between Scales and Variables

		WAT-1	**POPC**	**PCPC**	**PRISM SCORE**	**Length of stay in intensive care**	**Ventilation Time**	**Cumulative Opiate Dose**	**Highest Opiate Dose**	**Cumulative Benzodiazepine Dose**	**Highest Benzodiazepine Dose**
WAT-1	R	1.000									
	p	**0.000**									
POPC	R	0.399**	1.000								
	p	**0.000**	**0.000**								
PCPC	R	0.399**	1.000**	1.000							

	p	**0.000**	**0.000**	**0.000**							
PRISM SCORE	R	-0.003	0.351**	0.351**	1.000						
	p	0.982	**0.001**	**0.001**	**0.000**						
Length of stay in intensive care	R	0.453**	0.458**	0.458**	0.002	1.000					
	p	**0.000**	**0.000**	**0.000**	0.989	**0.000**					
Ventilation time	R	0.548**	0.417**	0.417**	-0.122	0.678**	1.000				
	P	**0.000**	**0.000**	**0.000**	0.279	**0.000**	**0.000**				
Cumulative opiate dose	R	0.302**	0.150	0.150	0.150	0.084	0.239*	1.000			
	p	**0.007**	0.185	0.185	0.186	0.461	**0.033**	**0.000**			
Highest opiate dose	R	0.272*	0.255*	0.255*	-0.038	0.174	0.359**	0.428**	1.000		
	p	**0.015**	**0.023**	**0.023**	0.738	0.123	**0.001**	**0.000**	**0.000**		
Cumulative benzodiazepine dose	R	-0.339**	-0.259*	-0.259*	-0.081	-0.253*	-0.173	-0.067	-0.082	1.000	
	p	**0.003**	**0.023**	**0.023**	0.481	**0.026**	0.132	0.563	0.476	**0.000**	
Highest benzodiazepine dose	R	0.340**	0.253*	0.253*	0.044	0.170	0.461**	0.081	0.330**	-0.075	1.000
	p	**0.002**	**0.027**	**0.027**	0.701	0.140	**0.000**	0.486	**0.003**	0.518	**0.000**

*<0,05; **<0,01; Correlation Analysis
WAT-1: Withdrawal Assessment Tool-1, POPC: Pediatric Overall Performance Category, PCPC: Pediatric Cerebral Performance Category

DISCUSSION

67.52% of the children participating in the study were male, and 38.8% were breastfed babies. In the study of Franck et al. (2008), 46% were in the 0-2 age group, 19% were in the 2.1-6 age group, and 35% were in the six and other age groups, similar to our study results, breastfed baby rates were found to be higher.

Acute Renal Failure was diagnosed in 66.2% of the children who participated in the study. In Dokken et al. (2021) study, the Respiratory failure rate was 47.5%, the postoperative follow-up rate was 32.5%, the multiple organ system failure rates was 12.5%, and the Acute liver failure rate was 5%.

Dormicum was used in 96.2% of the children in the sample group, ketamine in 2.5%, and fentanyl in 98.8%. In the study of Franck, Scoppettuolo, Wypij, and Curley (2012) on the validity and reliability of the Withdrawal Assessment Tool WAT-1 to monitor iatrogenic withdrawal syndrome in pediatric patients, it was determined that 37% of the children used Precedex, 27% Paracetamol, 25% Ketamine, 21% Chloral hydrate,% 18% Diphenhydramine, 17% Propofol, 15% Pentobarbital, 13% Clonidine, 7% Ibuprofen, 4% Toradol, 3% Phenobarbital, 3% Pentothal sodium, 1% Nalbuphine hydrochloride, 1% of Gabapentin, 1% of Naloxone hydrochloride, and 1% Sertraline. In the Dokken et al. (2021) study, 37.5% used Propofol, 35% Alimemazine, 52.5% Thiopental, 40% Morphine, 50% Fentanyl, 67.5% Midazolam, and 85% Ketobemidone.

It was found that 5% of the children participating in the study received opiates before the opiate tapering started, and 8.8% received opiates for more than ten days after the opiate tapering was initiated. The Franck et al. (2008) survey identified that children received opiates for an average of 6 days before the opiate tapering started and 11 days after the opiate tapering was initiated.

It was found that 9.1% of the children received benzodiazepine (dormicum) for more than ten days before benzodiazepine tapering started, and 7.9% received it after the tapering was initiated. The study by Franck et al. (2008) determined that benzodiazepine (dormicum) was used in children for an average of 7 days before and ten days after the tapering was initiated.

The content validity of WAT-1 applied to the children in the sample group was CVI=0.934, the content validity of POPC was CVI=0.914, and the content validity of PCPC was CVI=0.899. Whether a measuring instrument represents the intended phenomenon and the content validity is evaluated using the Lawshe technique. The measuring instrument's minimum content validity criteria (CVC) value should be 0.62 and above. The content validity of a measuring instrument is statistically significant when it provides CVI (content validity index) ≥ CVC or

CVI / CVC ≥ 0. In the study, CVI ≥ CVC (0.62) on all scales indicated the presence of content validity (Şencan, 2005). Therefore, according to the literature data, CVI obtained as a result of the research was high, and the literature data supports our study result.

It was found that the WAT-1 scores of the children in the study group differed significantly according to the lower and upper 27% groups ($t_{(42)}$=-18.472; p= .000< .05). For a thorough and reliable examination of the results of a diagnostic test, it is first necessary to check the actual level of effectiveness of the diagnostic test. Many statistical methods for decision-making are currently being used for this purpose. ROC (Receiver Operating Characteristic) curve is the most widely used method (Dirican, 2021). Roc analysis was performed to determine the effect of the WAT-1 score on predicting withdrawal status. Cut-off point Sensitivity was 81.82; Specificity was 100; the Youden index was J=0.818 (0<J=0.818<1). The optimum cut-off value of the scale was determined as>4. According to the WAT-1 cut-off point (4>), 56.2% of the children developed withdrawal. In the study of Franck et al. (2008), the cut-off point was accepted as "3> withdrawal".

When withdrawal symptoms occur in children, low-dose sedation is repeated by the doctor's decision. According to the WAT-1 cut-off point (4>) of the children in the sample group, 56.2% were above the cut-off threshold, and 68.8% had repeated sedation. Therefore, when the results obtained with the cut-off point were evaluated, it was established that the rates of children who underwent repeated sedation within the scope of the physician treatment protocol support our research.

The mean "PRISM score" of the children in the study group was found to be 23.354±25.700. However, in the study conducted by Da Silva et al. (2016), the children's mean "PRISM score" was 13. The mean length of stay in the sample group's intensive care unit was 24.600±16.326. Children's "length of stay in the intensive care unit" was 11 (7-21) days in the study of Ista, Dijk, Gamel, Tibboel, and Hoog et al. (2008), 14 days (10-23) in the study of Franck et al. (2008). The mean ventilation time of the children in the study group was found to be 9.463±7.439. In the study conducted by Dokken et al. (2021), the ventilation time of the children was 9 (6-13) days. The data obtained were parallel to our study results.

The mean cumulative opiate dose of the children was found to be 9476.760±19587.622 mcg/kg. The mean cumulative opiate dose of children was 972 µg/kg (493-1932) in the study of Dokken et al. (2021), 13000.7 µg/kg (5000.3-38000.3) in a similar survey conducted by Curley et al. (2015). The mean "highest opiate dose" of the children in the sample group was 1.271±0.637 mcg/kg. The mean highest opiate dose used in pediatric patients mechanically ventilated for acute respiratory failure was 3.3 (1.6-6.1) mcg/kg by Curley et al. (2015), and it was higher than our study.

The mean cumulative benzodiazepine dose of the children included in the study was 2268.714±8598.497 mg/kg. In the study of Curley et al. (2015), the mean highest cumulative dose of the children was 14.0 (5.1-41.5) mg/kg. The mean highest benzodiazepine dose of the children was 0.171±0.124 mg/kg. The mean highest benzodiazepine dose of the children was 2.9 (1.5-6.0) mg/kg by Curley et al. (2015).

A significant positive (p< .05) correlation was found between the WAT-1 scores of the children in the study group and POPC and PCPC scores. Furthermore, the findings showed that similar results were obtained when the criteria assessed on both scales were measured with WAT-1. A positive (p= .000< .05) significant difference was found between children's length of stay in the intensive care unit and WAT-1, POPC, and PCPC. These results indicate that the scales provide similar results for children's length of hospital stay.

A positive (p= .000< .05) correlation was found between the ventilation time of the children in the sample group and WAT-1, POPC, and PCPC. Furthermore, in the study by Curley et al. (2015), prolonged mechanical ventilation in children was associated with a higher PRISM 3 and a higher POPC score. Therefore, it is believed that the need for sedation increases as the ventilation time increases, and the risk of developing withdrawal and the children's general and cerebral performance category scores increase. A positive (p< .05) significant difference was found between the cumulative opiate dose of the children and WAT-1. Similar to our study, in the survey conducted by Amigoni et al. (2014), a significant correlation was found between the cumulative opiate dose and WAT-1.

There was a positive (p< .05) significant difference between the cumulative opiate dose received by the children and the ventilation time. Similarly, the study of Franck et al. (2008) determined a significant difference between cumulative opioid and benzodiazepine exposure, prolonged mechanical ventilation, and length of stay in the PICU. The study supports our result.

A positive (p< .05) correlation was found between the highest pediatric opiate dose and WAT-1, POPC, PCPC, pediatric ventilation time, and pediatric cumulative opiate dose. In the study of Amigoni et al. (2014), the highest opioid dose and cumulative opiate dose were associated with the presence of withdrawal syndrome. The study supports the positive correlation between the highest opiate dose and WAT-1.

A significant positive (p< .05) correlation was found between the highest benzodiazepine dose received by children and WAT-1, POPC, PCPC, ventilation time, and the highest opiate dose. In addition, in the study by Amigoni et al. (2014), high benzodiazepine and cumulative opiate doses were associated with withdrawal syndrome.

CONCLUSIONS

It was determined that the Withdrawal Assessment Tool WAT-1 was a valid and reliable scale that can be used for Turkish society. Therefore, it is recommended that healthcare professionals use it to determine the withdrawal development in children using opioids and benzodiazepines.

Author Contributions: Concept and design: R.K., A.KD. Data collection: R.K. Data analysis and interpretation: R.K., A.KD. Writing manuscript: R.K. Critical review: A.KD.

Conflict of Interest: The authors have no conflicts of interest to declare.

Funding: The authors declared that this study has received no financial support.

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