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Adapting the Cross-Culturally Adapted Care-Related Regret Coping Scale into Turkish: A Methodological Study

Kültürlerarası Uyarlanmış Bakımla İlgili Pişmanlık Başa Çıkma Ölçeği'nin Türkçeye Uyarlanması: Metodolojik Çalışma

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ABSTRACT Objective: The purpose of the current study is to investigate the Turkish validity and reliability of the Care-Related Regret Coping Scale. **Material and Methods:** The study was conducted within a methodological design and 257 nurses participated. The scale was re-administered to 30 of the nurses participating in the survey for test-retest evaluation was taken. The study includes the stages of translation and content validity, evaluation of validity (exploratory and confirmatory factor analyses) and reliability analysis. **Results:** The language of the scale was found to be appropriate according to translation-back translation and evaluation by experts. The sample adequacy calculated by KMO was 0.728, and the Bartlett's test result was detected to be χ^2=506.942 (sd: 45 p<0.001). Exploratory factor analysis yielded a structure consisting of 8 items and 2 factors. These 2 factors explain 65.3% of the total variance. The fit indices values (Cmin/df=1.283, Root Mean Square Error of Approximation=0.046, Standardized Root Mean Square Residual=0.039, Goodness of Fit Index=0.961, Adjusted Goodness of Fit Statistic=0.918, Normed Fit Index=0.957, Non-Normed Fit Index (NNFI)=0.983, Comparative Fit Index=0.990, Incremental Fit Index=0.990) indicated that the model showed a good fit. Confirmatory factor analysis confirmed the 2-factor structure. The Cronbach's alpha values of the subscales were found to be α=0.887 and α=0.741. The intraclass correlation coefficient for the 3 factors in the original scale was found to be 0.902, 0.850, and 0.925. **Conclusion:** The study's results indicated that the Care-Related Regret Coping Scale-TR version was sufficient according to the validity and reliability results. The scale can be used to evaluate how nurses cope with care-related regret in Türkiye.

Keywords: Care; nursing; regret; reliability; scale; validity

ÖZET Amaç: Bu çalışmanın amacı, Bakımla İlgili Pişmanlık Başa Çıkma Ölçeği'nin Türkçe geçerliliğini ve güvenilirliğini incelemektir. **Gereç ve Yöntemler:** Çalışma, metodolojik tasarımla yürütülmüştür ve 257 hemşire katılmıştır. Ankete katılan hemşirelerden 30'una ölçek tekrar uygulanmış ve test-tekrar test değerlendirmesi yapılmıştır. Çalışma, çeviri ve içerik geçerliliği, geçerliliğin değerlendirilmesi (açımlayıcı ve doğrulayıcı faktör analizleri) ve güvenilirlik analizi aşamalarını içermektedir. **Bulgular:** Ölçeğin çeviri-geri çeviri yapılmış ve uzmanlar tarafından yapılan değerlendirmeye göre uygun bulunmuştur. KMO analizine göre hesaplanan örneklem yeterliliği 0,728 olup, Bartlett testi sonucu χ^2=506,942 (sd: 45 p<0,001) olarak bulunmuştur. Açımlayıcı faktör analizi, 8 madde ve 2 faktörden oluşan bir yapı ortaya koymuştur. Bu 2 faktör toplam varyansın %65,3'ünü açıklamaktadır. Uyum indeksi değerleri (Cmin/df=1,283, Tahmin Hatalarının Ortalamasının Karekökü=0,046, Standartlaştırılmış Hata Kareleri Ortalamasının Karekökü=0,039, İyilik Uyum İndeksi=0,961, Ayarlanmış Uyum İyiliği İstatistiği=0,918, Normlu Uyum İndeksi=0,957, Normlaştırılmamış Uyum İndeksi (NNFI)=0,983, Karşılaştırmalı Uyum İndeksi=0,990, Fazlalık Uyum İndeksi=0,990) modelin iyi bir uyum gösterdiğini ortaya koymuştur. Doğrulayıcı faktör analizi 2 faktörlü yapıyı doğrulamıştır. Alt ölçeklerin Cronbach alfa değerleri α=0,887 ve α=0,741 olarak bulunmuştur. Orijinal ölçekteki 3 faktör için sınıf içi korelasyon katsayısı sırasıyla 0,902, 0,850 ve 0,925 olarak bulunmuştur. **Sonuç:** Çalışma sonuçları, Bakımla İlgili Pişmanlık Başa Çıkma Ölçeği-TR versiyonunun geçerlilik ve güvenilirlik sonuçlarına göre yeterli olduğunu göstermiştir. Ölçek, Türkiye'de hemşirelerin bakımla ilgili pişmanlıkla nasıl başa çıktıklarını değerlendirmek için kullanılabilir.

Anahtar Kelimeler: Bakım; hemşirelik; pişmanlık; güvenilirlik; ölçek; geçerlilik

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Risks, undesirable events, and mistakes when providing healthcare services are a global problem.[1] Many patients are harmed or killed every year because of unsecured health care. According to the data obtained from high-income countries, approximately 1 out of every 10 patients in health institutions is harmed by the services provided, resulting in more than 3 million deaths every year. Furthermore, evidence shows that 134 million undesirable events also emerge in hospitals in low- and middle-income countries, resulting in approximately 2.6 million deaths yearly.[1,2]

Errors can occur due to multiple interrelated factors. Current error prevention approaches focus on systems and processes rather than people.[3] Despite this approach, healthcare professionals experience regret as an emotional response when the decisions they make when providing patient care cause an undesirable event.[4] This regret causes psychosomatic complaints such as stomach pain, tightness of the throat/chest, headache, fever, tremors, palpitations, loss of appetite, fatigue, and feeling sick healthcare professionals.[5,6] Sleep quality is also affected, and they have insomnia.[6,7] As a result, they tend to take more sick leave.[8,9] Furthermore, when they regret their care, they feel less satisfied with their job and experience more desire to quit.[10]

Given the complexity of the healthcare environment, regret is an inevitable consequence of clinical practice. However, whether this results in a positive or negative outcome depends on the health professionals' coping strategies.[4] Coping with care-related regret involves 2 strategies: problem-focused and emotion-focused. Problem-focused strategies include initiatives to change the environment to correct the situation or prevent it from recurring. On the other hand, an emotion-focused strategy can be adaptive or maladaptive depending on the interventions used by the person to cope with his/her own emotions (such as re-evaluation, acceptance, and self-attack).[11] Few studies have been conducted to evaluate the care-related regrets of healthcare professionals and the possible consequences. Yet, the few studies that have been documented report that problem-focused and emotion-focused adaptive coping styles yield positive outcomes, such as requesting less sick leave and experiencing less insomnia.[7,8] Therefore, the healthcare professionals' coping strategies must be evaluated and monitored.

Given the roles and responsibilities of nurses in ensuring patient safety, identifying the methods used by this group to cope with care-related regret is particularly important. Studies on coping with care-related regret generally look at all health professionals. At the national level, however, there needs to be a tool for assessing how to cope with care-related regret. Therefore, this study was conducted to investigate the Turkish validity and reliability of the Care-Related Regret Coping Scale (CRRCS) designed by Courvoisier et al.[11] The current study will help identify the methods used by Turkish nurses when they experience care-related regret and what needs to be done for them to adopt effective coping strategies.

MATERIAL AND METHODS

STUDY DESIGN

The study employed a methodological pattern to adapt the CRRCS to Turkish culture. The process of adjusting the scale to Turkish involved ensuring language equivalence with the original scale, conducting validity and reliability analyses, and presenting the final scale.[12] The study was reported according to the Strengthening the Reporting of Observational Studies in Epidemiology Checklist.

PROCESS OF TRANSLATION AND BACK TRANSLATION

The translation-back translation method, which is frequently used in language equivalence studies, was used.[13] Two linguists translated the measurement tool from English into Turkish. The scale was given its initial Turkish form by conceiving the resemblances and the differentials between the 2 translations, then presented to a Turkish Language expert to check its compatibility with the Turkish language structure. The Turkish version of the scale was then reworked in line with the language expert's recommendations. Another expert then translated the X Turkish scale back into English to determine if it matched the original version. The researchers then critiqued the back-translated scale. Afterward, it was sent via e-mail to the principal author to determine whether there was a

change in the meaning of the scale items. The author evaluated the scale in terms of language equivalence and approved it.

SAMPLE AND SETTING

This research was carried out in a university hospital with a capacity of over 500 beds. When calculating the sample size for scale adaptation, the recommended number of individuals to reach is 5-10 times the number of items in the survey.[14] Accordingly, 257 participants were used to adapt the 15-item scale. In the retest phase of the measurement tool, the scale was re-administered to 30 participants 2 weeks later. Nurses with at least 6 months of professional experience and who were actively working in the clinic were included in the study.

MEASURES

The data for the study were collected using the demographic questionnaire and the CRRCS.

Demographic Questionnaire

This form consists of 7 questions asking the nurses' age, gender, education, how long they have worked in the nursing profession, how long they have worked in the institution, how long they have worked in the clinic where they work, and information about the clinic where they work.

Care-Related Regret Coping Scale

The CRRCS, developed by Courvoisier et al. evaluates the coping behaviors of healthcare professionals after incidents of regret experienced during care delivery. The scale consists of 15 items, measured on a 4-point Likert (1: never, 4: always). The scale has 3 dimensions: "Problem-focused regret coping" (1, 2, 3, 4, 13), "Maladaptive regret coping" (6, 7, 8, 9, 12), and "Adaptive regret coping" (5, 10, 11, 14, 15).[15] The average score is calculated to determine the coping behaviors used to cope with care-related regret. The total score of the instrument is not calculated that there are 3 different types of coping behaviors. As the mean score from the dimension increases, the frequency of showing care-related regret coping behavior increases. The validity of the scale has been proven in the French, German, Danish, and Brazilian languages.[16]

DATA ANALYSES

The researchers used the IBM SPSS 25 package program and AMOS 24 software to analyze the research data. Continuous variables were reported as mean (X) and standard deviation, while the categorical variables were reported as percentage and number. The validity and reliability of the scale were evaluated using various methods. Exploratory factor analysis (EFA) and Confirmatory Factor Analysis (CFA) factor analyses were performed to determine construct validity. Since there was no relationship between the adapted scale sub-factors, Principal Component Analysis and Varimax rotation were preferred when performing EFA.[17] Factors with 1 or more eigenvalues were considered when determining the number of factors. In CFA, model fit indices, frequently used in the literature, were reported by considering the measurement values. The maximum likelihood method was preferred as the estimation point in CFA. This method is commonly used to improve the assumption of normal distribution, parameter estimation, and fit indices (source). Composite Reliability (CR) and Average Variance Extracted (AVE) values were also calculated. Item-total score correlation, internal consistency (Cronbach α), and split-half analyses were applied to determine reliability. Intraclass correlation (ICC) analysis was performed for the test-retest.

ETHICS

Permission was obtained from the principal author to use the CRRCS. Hacettepe University Health Sciences Research Ethics Committee evaluated the study's suitability from an ethics standpoint and approved it (date: July 23, 2024; no: 2024/12-34). Additionally, this study was conducted in accordance with the principles of the Declaration of Helsinki. Permission was obtained from the healthcare institution. The participants gave their informed consent in writing after being informed about the study.

RESULTS

CHARACTERISTICS OF PARTICIPANTS

Of the n=257 nurses participating in the study, 37.4% were aged 22-29 and 90.3% were women; 80.1% of them had a formal undergraduate degree and 44.4%

had 11 years or more of professional experience; 38.9% of them had 11 years or more of experience in the hospital where they worked, 44.0% had 1-5 years of experience on the ward where they worked, and 79.0% worked in adult wards (Table 1).

VALIDITY ANALYSIS

Content Validity

Expert opinion was sought when evaluating content validity. The Davis technique was used to assess expert opinions. Each item was reviewed by seven experts from the field of nursing (1: Not suitable, 2: The statement needs to be reworded, 3: Suitable, but a minor change is required, 4: Suitable).[18] In addition, experts who scored 2 and 3 during the evaluation were expected to recommend alternatives. As a result of the expert evaluations, the Content Validity Index (CVI) was calculated as 0.857.

TABLE 1: Descriptive statistics for the sociodemographic characteristics of nurses (n=257)

Variables	Sub-groups	Number (n)	Percentage (%)
Age	22-29	96	37.4
	30-34	60	23.3
	35-44	69	26.8
	45 and over	32	12.5
Gender	Female	232	90.3
	Male	25	9.7
Education level	Health vocational high school diploma/ associate degree	11	4.3
	Undergraduate	225	87.5
	Post-grad and PhD	21	8.2
Years of professional experience as a nurse	Less than 1 year	12	4.7
	1-5 years	80	31.1
	6-10 years	51	19.8
	11 years and above	114	44.4
Years of professional experience in the hospital where they work	Less than 1 year	19	7.4
	1-5 years	92	35.8
	6-10 years	46	17.9
	11 years and above	100	38.9
Years of professional experience in the unit where they work	Less than 1 year	36	14.0
	1-5 years	113	44.0
	6-10 years	44	17.1
	11 years and above	64	24.9
Duty station	Adult wards	203	79
	Pediatric wards	34	13.2
	Other	20	7.8

Construct Validity

The scale was first checked using Kaiser-Meyer-Olkin (KMO) and Bartlett's tests to see whether it was suitable for EFA. The KMO value determined for evaluating the sample size was 0.714. The Bartlett's test result was calculated as χ^2=454.021, sd: 28 p<0.001. These results show that the scale is suitable for EFA analysis.

No limitation was placed on the number of factors in EFA. Items with a factor load above 0.50 were included in the scale. As a result of the factor analysis, the number of items decreased from 15 in the original to 8. The researchers observed that these 8 items were grouped into 2 factors, and all factor loads were above 0.50. In the 2-factor structure, the 1st factor consists of 4 items and explains 36.8% of the existing structure, and the 2nd factor consists of 4 items and explains 28.5% of the existing structure. These findings explain 65.3% of the model and validate construct validity. When renaming the factors, the items under each factor were considered. Accordingly, the 1st factor is "problem-focused regret coping", and the 2nd is "Maladaptive regret coping".

Model fit indices were checked for CFA to test the accuracy of EFA results and evaluate the validity of the scale. Accordingly, the fit index values were calculated as Cmin/df (χ^2=21.807/df=17, p=0.192)=1.283, Root Mean Square Error of Approximation (RMSEA)=0.046, Standardized Root Mean Square Residual=0.039, Goodness of Fit Index=0.961, Adjusted Goodness of Fit Index (AGFI)=0.918, Normed Fit Index=0.957, Non-Normed Fit Index (NNFI) (Trucker-Levis Index)=0.983, Comparative Fit Index=0.990, Incremental Fit Index=0.990. Modification (adjustment) was applied between items e2 and e3, e7 and e8 to improve AGFI and RMSEA values (Figure 1). According to the CFA result, the 2-factor structure was

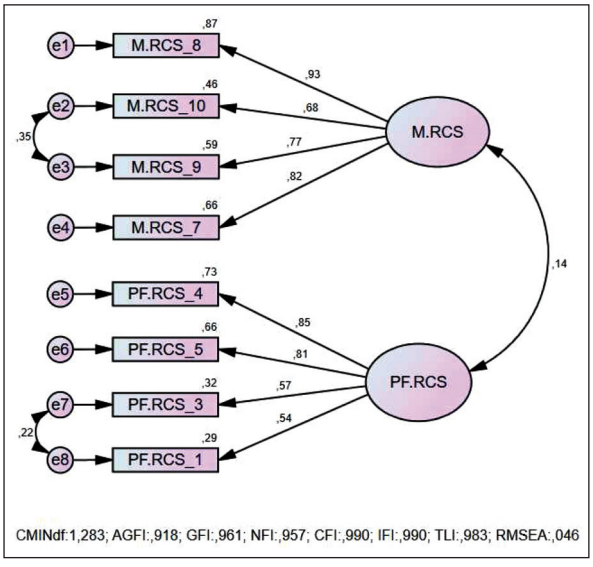

FIGURE 1: Fit indices and model of confirmatory factor analysis
AGFI: Adjusted Goodness of Fit Index; GFI: Goodness of Fit Index; NFI: Normed Fit Index; CFI: Comparative Fit Index; IFI: Incremental Fit Index; TLI: Trucker-Levis Index; RMSEA: Root Mean Square Error of Approximation

approved (Figure 1). In addition, CR and AVE values were calculated within the factors' convergent validity scope. The CR value for Factor 1 was 0.878 and the AVE value was 0.647, while the CR value for Factor 2 was 0.794 and the AVE value was 0.501 (Table 2).

RELIABILITY ANALYSIS

When the item-total score correlations of the CRRCS are examined in Table 2, the correlation coefficients range between 0.741-0.809 for Factor 1 and between 0.463-0.630 for Factor 2. The Cronbach's alpha was calculated as α=0.887 and α=0.741 for Factors 1 and 2, respectively. For Factor 1, the correlation coefficient between the 2 halves was 0.729, the Spearman-Brown coefficient was 0.843, and the Guttman Split-Half coefficient was 0.843. These numbers are 0.570, 0.726, and 0.725 for Factor 2.

The ICC coefficient was determined as 0.902 for "Maladaptive regret coping", 0.850 for "Problem-focused regret coping", and 0.925 for "Adaptive regret coping".

The final version of the scale items as a result of exploratory and confirmatory analysis is given in Table 3.

DISCUSSION

This study adopted a scale that can be used to evaluate the regret coping strategies experienced by nurses after an undesirable situation occurs when administering patient care to Turkish culture. The study results indicated that the CRRCS-Turkish (CRRCS-TR) version was sufficient according to the validity and reliability results. The scale has been adapted to different cultures and its validity and reliability have been proven.[16,19,20]

Expert opinion was sought to evaluate how well the concept that the scale wanted to measure was measured, and the CVI calculated in line with expert opinions was found to be above 80%. The fact that

TABLE 2: Results of validity and reliability analysis

	EFA results				CFA Results						Reliability Results		
	Factors		Eigen	Explained									
Items	F1	F2	Value	Variance (%)	λ	λ²	1-λ²	AVE	CR	CTRC	α	SB	GSH
M.RCS_8	0.895		2.941	36.760	0.934	0.872	0.128	0.647	0.878	0.680	0.887	0.843	0.843
M.RCS_10	0.883				0.679	0.461	0.539			0.809			
M.RCS_9	0.851				0.767	0.588	0.412			0.741			
M.RCS_7	0.755				0.815	0.664	0.336			0.783			
PF.RCS_4		0.816	2.284	28.547	0.854	0.729	0.271	0.501	0.794	0.592	0.741	0.726	0.725
PF.RCS_5		0.815			0.814	0.663	0.337			0.630			
PF.RCS_3		0.705			0.566	0.320	0.680			0.479			
PF.RCS_1		0.649			0.540	0.292	0.708			0.463			
Total variance explained				65.307									

EFA: Explanatory factor analysis; CFA: Confirmatory factor analysis; λ: Standardized regression coefficient; AVE: Average variance extracted; CR: Composite reliability coefficient; CTRC: Corrected item total score correlation; α (Alpha): Cronbach's alpha reliability coefficient; SB: Spearman-Brown coefficient; GSH: Guttman Split-Half coefficient; F1: Factor 1; F2: Factor 2

TABLE 3: Turkish version of CRRCS

Eski madde No.	Yeni madde No.	Tüm maddeler
Genel olarak, hastalarla yaşadığım olaylar veya durumlar konusunda pişmanlık duyduğumda...		
		BİPBÇ: Problem odaklı
1	1	Beni dinlemeleri veya kendimi yeniden güvende hissetmek için meslektaşlarımla konu hakkında konuşurum.
3	2	Duruma somut çözümler bulmaya çalışırım.
4	3	Benzer olayların tekrarlanmasını önlemek için bir yöneticiye danışırım.
5	4	Uygulamalarımızı geliştirmek için konuyu meslektaşlarımla tartışırım.
		BİPBÇ: Uyumsuz
7	5	Olayları sürekli zihnimde canlandırıp dururum.
8	6	Olayı zihnimi işgal edecek kadar çok düşünürüm.
9	7	Kendimi suçlama eğilimim var.
10	8	Sürekli bu konuları düşünürüm.

BİPBÇ: Bakımla ilişkili pişmanlıkla başa çıkma

the CVI is above 80% indicates that the content validity is quite good.[21] Similar to our findings, the content validity was quite good (CVI: 1.00) in the Brazilian adaptation of the scale.[16] These results suggest that the scale measures the concept it wants to evaluate reasonably and adequately.

The KMO calculated to evaluate the compliance of the scale with EFA was found to be moderate and the Bartlett Sphericity test was found to be χ^2=454.021, sd:28 p<0.001. The significance of KMO>0.7 and Bartlett's Sphericity test p<0.05 shows that the data approach multivariate normality and are suitable for factor analysis.[22] Exploratory factor analysis yielded an 8-item and 2-factor structure. These 2 factors also explain more than half of the total variance. Unlike our findings, the number of items and the factor structure were similar to the original scale in the Brazilian Portuguese and German adaptations.[16,20] In adapting the scale to Danish culture, the factor structure was preserved but the number of items decreased to 10.[19] These differences in the cultural adaptations of the scale may be due to the differences in cultural characteristics, samples, and the characteristics of the institutions where the study was conducted. Furthermore, coping strategies in this study were grouped under 2 factors, and most of the items in the adaptive coping strategy on the original scale were removed. Accordingly, it can be said that when Turkish nurses cause an undesirable event, they are limited in their ability to manage their emotions positively.

The fit index values showed that the scale demonstrated a "good" fit.[23] Confirmatory factor analysis was carried out to assess whether the scale items were included in the specified factors. As a result of CFA, it was confirmed that the CRRCS-TR has a 2-factor structure (Figure 1). The study also calculated the CR value for both factors as >0.70 and AVE as >0.50 for the relationship of the items in each factor with each other and with the factor to which they belong and for the similarity validity between the items (Table 2). The CR value above 0.70 indicates that the factor has construct reliability and the AVE value above 0.50 indicates that the factor has combination validity.[24,25] We can, therefore, state that both factors in the scale provide convergent validity.

The item-total score correlation coefficients calculated to evaluate the reliability of the scale ranged between 0.463-0.809; the Spearman-Brown coefficients ranged between 0.726-0.843; the Guttman Split-Half coefficients ranged between 0.725-0.843, and the Cronbach alpha coefficients ranged between 0.741-0.887. These results show that the scale has valid internal consistency and reliability.[21] Although the Cronbach alpha coefficients calculated for the original scale and other cultural adaptations are different, they are at an acceptable level.[11,16,19,20] These results suggest that the scale has good cross-cultural reliability and is highly reliable for use in our country.

The ICC value is above 0.80. The fact that the correlation coefficient is close to 1 shows that the invariance of the scale over time is strong.[21] Unlike our findings, the ICC value was lower, albeit at acceptable levels, in the scale's German and Brazilian Portuguese adaptations.[16,20] We can, therefore, say that there is a strong relationship between the measurements of the scale administered at different times and that it can reliably measure the same characteristics.

LIMITATIONS

This study, conducted to adapt the scale to Turkish culture, has some limitations. The study sample size is good. However, the study was conducted using the convenience sampling method in a university hospital in Türkiye. In addition, only participants working in clinics were included in the sample. Nurses providing outpatient/home care services were omitted. This makes it difficult to generalize.

Moreover, due to the lack of alternative scales to assess regret about care, the scale could not be evaluated using the parallel test method. In addition to all this, the culturally adapted scale is self-reporting. For this reason, participants may have experienced bias during marking and prioritized social appreciation.

CONCLUSION

This study was conducted to adapt the CRRCS developed by Crouviser et al. to Turkish culture.[15] The study showed that the validity and reliability of the CRRCS-TR were sufficient. The scale adapted to Turkish consists of 2 dimensions and 8 items. It is seen that the internal consistency and time invariance of the scale are at a good level. The scale items and the situation it specifically assesses are clear and understandable regarding Turkish culture. These results indicate that the Cross-Cultural Adapted Caregiving Regret Coping Scale can be used as an effective measurement tool to determine the strategies used by Turkish nurses to cope with caregiving regret.

IMPLICATIONS FOR NURSING PRACTICE

This is the first study in which a measurement tool that has been translated into different languages and proven to be culturally adapted has been adapted to Turkish culture. The scale is handy for determining the strategies employed for coping with regret experienced in the delivery of patient care. Having few items and sub-dimensions (problem-oriented/ineffective coping), the scale can be administered and evaluated quickly.

Nurses' physical and psychological resilience is crucial for the success and sustainability of the care they provide. Nurses' well-being directly affects patient outcomes, staff retention, and work culture.[26] This scale can help nurses understand the regrets they experience in patient care and develop effective coping methods. At this point, the administration of nursing services should create a supportive and positive working environment where nurses can confidently express themselves. In addition, training programs should be planned to enable nurses to increase their self-awareness, improve their stress management skills, and learn effective coping methods; furthermore, their psychological well-being needs to be supported.

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Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

Authorship Contributions

All authors contributed equally while this study preparing.

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