Full length article

Developing the sexual and reproductive health knowledge scale in emergencies

Ebru Cirban Ekrem [a], Aylin Kurt [b],*

[a] Lecturer of Nursing Department, Faculty of Health Sciences, Bartin University, Ağdacı Campus, 74110 Bartin, Turkey
[b] Nursing Department, Faculty of Health Sciences, Bartin University, Ağdacı Campus, 74110 Bartin, Turkey

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ABSTRACT

Objective: This study aims to develop the The Sexual and Reproductive Health Knowledge Scale in Emergencies (SRHKE) to evaluate the sexual and reproductive health knowledge of nurses in exceptional circumstances and cases.

Method: This methodological study was conducted with a total of 311 nurses from two hospitals in the Western Black Sea Region of Turkey between December 2021 and May 2022. The data were collected using a descriptive information form and SRHKE. The content validity, construct validity, and internal consistency of the scale were tested.

Results: The scale had a four-factor structure, and these factors explained 65% of the total variance in the measured variable. It had high internal consistency (Cronbach's alpha coefficient values were 0.826 for the 1st factor, 0.814 for the 2nd factor, 0.788 for the 3rd factor, 0.723 for the 4th factor, and 0.896 for the total scale). The item-total score correlation values of the scale ranged from 0.479 to 0.659. Pearson's correlation coefficients calculated for the evaluation of construct validity ranged from 0.519 to 0.749 (p < 0.005).

Conclusion: SRHKE has high validity and reliability. The scale can be used by nurses in Turkish society to determine their levels of sexual and reproductive health knowledge in emergencies.

Introduction

The World Health Organization (WHO) defines health emergencies as sudden-onset events arising from naturally occurring or human-made hazards or situations where the risk to public health gradually increases over time [30]. A high frequency of recent adverse events such as conflicts, violence, and disasters has increased the number of people adversely affected across the world [2].

A high level of awareness of reproductive health needs in emergencies has been emphasized since the mid-1990 s. Therefore, the Inter-Agency Working Group on Reproductive Health in Crises (IAWG) was established in 1995, followed by the creation of the Minimum Initial Service Package (MISP), a set of guidelines for reproductive health service delivery in crises [15]. It is recommended that the MISP be implemented within the first 48 h of a crisis [26]. The MISP mainly aims to facilitate the coordination of reproductive health services to prevent and manage the consequences of sexual violence, reduce HIV transmission rates, minimize maternal and newborn morbidity and mortality, and plan comprehensive reproductive health services after crises. In

crises, some challenges may appear during the implementation of the MISP, including insufficient awareness of emergencies and reproductive health knowledge, logistical difficulties, and poor or inadequate coordination (IAWG, 2018).

The risk of sexual violence increases in unsafe environments; therefore, both sexual and reproductive health and rights of women, girls, and boys should be protected. Additionally, the rates of sexually transmitted infections (STIs), including HIV, and difficulties in accessing treatment and prevention services increase in crisis environments. There are an estimated 32 million women and girls of reproductive age living in humanitarian crisis environments, and all of them need access to sexual and reproductive health (SRH) information and services [24,26]. Studies have reported that maternal mortality, which is still an important problem today, is around 30% higher in crisis environments. In this context, as childbirth is an urgent and unstoppable event, women and girls often have to give birth in crisis environments before they are provided with adequate healthcare. As a result, the risk of mortality and morbidity led by preventable causes increases in both mothers and newborns [3,25]. Although the right to SRH is an essential part of the

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Table 1
Characteristics of participants.

	Mean ± SD	Min-Max values
Age (years)	31.79 ± 7.12	20–50
Work experience (years)	9.40 ± 7.61	1–32
	n	**%**
Gender		
Female	257	82.6
Male	54	17.4
Education level		
High school	15	4.8
Associate degree	49	15.8
Bachelor's degree	202	65.0
Master's degree/PhD	45	14.5
Has received education on sexual and reproductive health		
Yes	234	75.2
No	77	24.8
Has received education on emergencies		
Yes	132	42.4
No	179	57.6
Knows about sexual/reproductive health in emergencies		
Yes	135	43.4
No	176	56.6

Table 2
Statistical methods used to develop the scale.

Method		Test	
Validity	Content validity	Lawshe's method	Content Validity Index
	Explanatory Factor Analysis		Bartlett's Test of Sphericity
			Kaiser-Meyer-Olkin Test
			Direct Oblimin Rotation
	Confirmatory Factor Analysis		Factor Loads
			Fit Indices
Reliability	Internal Consistency		Cronbach' alpha Coefficient
	Item-Total Score Correlation		Item Loads

right to health [22], it has historically had low significance in the humanitarian response hierarchy [15]. The 2030 Agenda for Sustainable Development should be followed to achieve the vision of transforming the world [2,4] as the agenda aims to reduce maternal and neonatal mortality and morbidity rates, reduce the rates of HIV and STIs, and ensure gender equality [28]. It is also recommended by WHO, the United Nations Children's Fund (UNICEF), the Joint United Nations Programme on HIV/AIDS (UNAIDS), and the United Nations Office for Disaster Risk Reduction (UNDRR) to put health services at the center of disaster risk management [26].

There is a need for studies to present sufficient data on the MISP from all over the world and increase the quality of data on the MISP [15,22]. Additionally, it is recommended that some standard templates be used to monitor and evaluate relevant indicators as there is an insufficient number of indicators to monitor and evaluate the adequacy of SRH service delivery and its impact on morbidity and mortality in humanitarian settings [4]. In this regard, this study aimed to develop a sexual and reproductive health knowledge scale for emergencies to evaluate the sexual and reproductive health knowledge levels of nurses in exceptional circumstances.

Method

Design

This is a methodological study.

Sample

This study was conducted with nurses from two hospitals in the Western Black Sea Region of Turkey. Data obtained from 10 to 15 people are considered sufficient for the pilot application of a scale [13]. In this study, a total of 15 nurses were included in the pilot application of the scale development process. In scale development studies, the sample size should be 5–10 times of the total scale items used in the study [1]. Therefore, as our draft scale consisted of 31 items, a total of 311 nurses (except for those included in the pilot application) who met the inclusion criteria were included in the sample. The inclusion criteria were as follows: (1) being a nurse and (2) agreeing to participate in the study.

The mean age of the nurses who participated in the study was 31.79 ± 7.12 years, while the majority of them were female (82.6%) and had

undergraduate degrees (65.0%). Their mean work experience was 9.40 ± 7.61 years. It was determined that 75.2% of the participants had received training on sexual and reproductive health, 57.6% had not received training on exceptional circumstances, and 56.6% did not have knowledge about sexual/reproductive health in exceptional circumstances (Table 1).

Data collection

The data were collected between December 2021 and May 2022, using a descriptive information form and the Scale for Sexual and Reproductive Health Knowledge in Emergencies (SRHKE). A draft scale was created in line with previous studies in the relevant literature [6,12,19,20,29]. The draft scale consisted of 31 items. A total of eight Turkish language experts were consulted to ensure the content and linguistic validity of the scale. After receiving expert opinions, a pilot study was conducted including 15 nurses to test the intelligibility of the scale items. Relevant changes were made to incomprehensible expressions in the items. After the draft scale was finalized, the scale was applied to 311 nurses from two hospitals in Bartın, Turkey. The scale was re-administered to 60 nurses one month later. Each participant filled in the scale in around 15 min.

Descriptive Information Form: The form included questions about the demographic characteristics of the participants including their age, gender, education level, working experience, and status of having training on sexual health/reproductive health in exceptional circumstances.

Scale for Sexual and Reproductive Health Knowledge in Emergencies (SRHKE): SRHKE was developed to evaluate the sexual and reproductive health knowledge levels of nurses in emergencies. This is a five-point Likert type scale with 23 items, where each item is scored as Strongly disagree = 1, Disagree = 2, Undecided = 3, Agree = 4, or Strongly agree = 5. Five items (4, 8, 15, 18, and 23) are scored in reverse. The scale consists of four factors, and the total score of the scale is calculated by summing up factor scores. The Cronbach's alpha coefficient values were found as 0.826 for the 1st factor (Empowering Women's Health), 0.814 for the 2nd factor (Material Supply to Implement the Minimum Initial Service Package in Emergencies), 0.788 for the 3rd factor (Basic Knowledge of the Minimum Initial Service Package in Emergencies), 0.723 for the 4th factor (Strategy and Training on the Minimum Initial Service Package in Emergencies), and 0.896 for the total scale.

Data analysis

The data were analyzed using the IBM SPSS 22.0 and AMOS 16.0 programs. The level of statistical significance was accepted as p < 0.05. Table 2 presents the methods used in the data analysis.

Table 3

Explanatory factor analysis results.*

Item	Factor 1	Factor 2	Factor 3	Factor 4
1	0.676			
2	0.767			
3	0.816			
4**	0.608			
5	0.807			
6	0.652			
7	0.799			
8**	0.830			
9	0.811			
10	0.814			
11	0.680			
12	0.747			
13		0.622		
14		0.689		
15**		0.798		
16		0.785		
17		0.838		
18**			0.859	
19			0.869	
20			0.539	
21				0.686
22				0.817
23**				0.805
Explained variance (%)	31.938	46.928	56.852	65.653
Eigenvalue	9.328	3.124	1.469	1.180
Kaiser-Meyer-Olkin Measure	0.894			
Bartlett's Test of Sphericity	0.000			

* All r values are significant at p ≤ 0.05. ** Reverse coding is required.
Extraction method, principal; Rotation method, Direct Oblimin with Kaiser Normalization.

Research ethics

For conducting the study, ethical approval was obtained from the ethics committee of a university (decision no: 17 dated 06.12.2021), and permissions were received from both the institution where the study would be conducted and the relevant Provincial Health Directorate. After they were informed about the purpose and scope of the study and the confidentiality of their information, written informed consent was obtained from the participants.

Results

The explanatory factor analysis (EFA) and confirmatory factor analysis (CFA) methods were used to determine the construct validity of the scale. First, sample suitability and Bartlett's tests were performed to determine the suitability of the data for factor analysis. The Kaiser-Meyer-Olkin (KMO) sample fit coefficient was found as 0.894, and the Bartlett's test of sphericity chi-squared value was 487.668 ($p < 0.001$). A factor analysis was performed as the KMO value was higher than 0.70, and the result of the Bartlett's test of sphericity was significant (Table 3).

Because of their overlapping values, eight items were excluded from the analysis. For the remaining 23 items, the factors were rotated using the Direct Oblimin Rotation method. Accordingly, the scale was found to have a four-factor structure with eigenvalues above 1 each (Table 3, Fig. 1). The eigenvalue of the first factor was 9.328 and the rate of the total variance in the measured characteristic it explained was 31.938%. The eigenvalue of the second factor was 3.124, and the rate of variance it explained was 46.928%. The eigenvalue of the third factor was 1.469, and the rate of variance it explained was 56.852%. Finally, the eigenvalue of the fourth factor was 1.180, and the rate of variance it explained was 65.653% (Table 3).

The accuracy of the construct obtained by EFA was examined by CFA. Fig. 2 shows the path diagram containing the standardized results obtained in CFA. Accordingly, the goodness-of-fit indices of the data were acceptable (χ^2/df = 2.616, GFI = 0.97, RMSEA = 0.06, NFI = 0.91, IFI = 0.993, CFI = 0.97, RFI = 0.86, IFI = 0.92) (Table 4).

Item-total score correlation and Cronbach's alpha coefficients were examined to test the reliability of the scale. The item-total score correlation coefficients of the remaining 23 items were above 0.20. The Cronbach's alpha coefficient values were 0.826 for the 1st factor, 0.814 for the 2nd factor, 0.788 for the 3rd factor, 0.723 for the 4th factor, and 0.896 for the total scale (Table 5). The Pearson's correlation coefficients calculated for the evaluation of the construct validity of the scale ranged from 0.519 to 0.749 ($p < 0.005$) (Table 6).
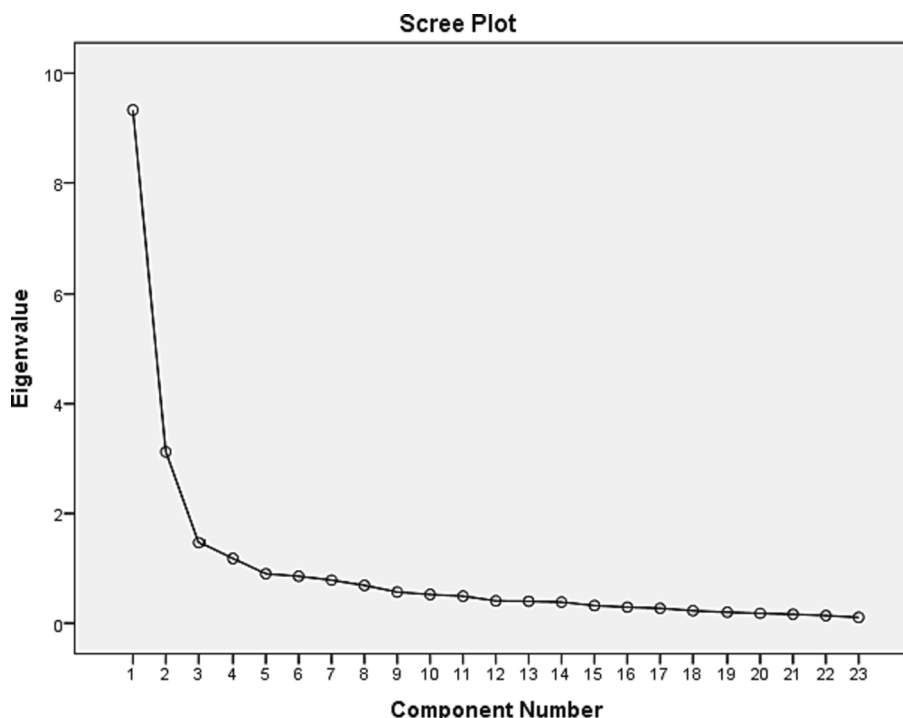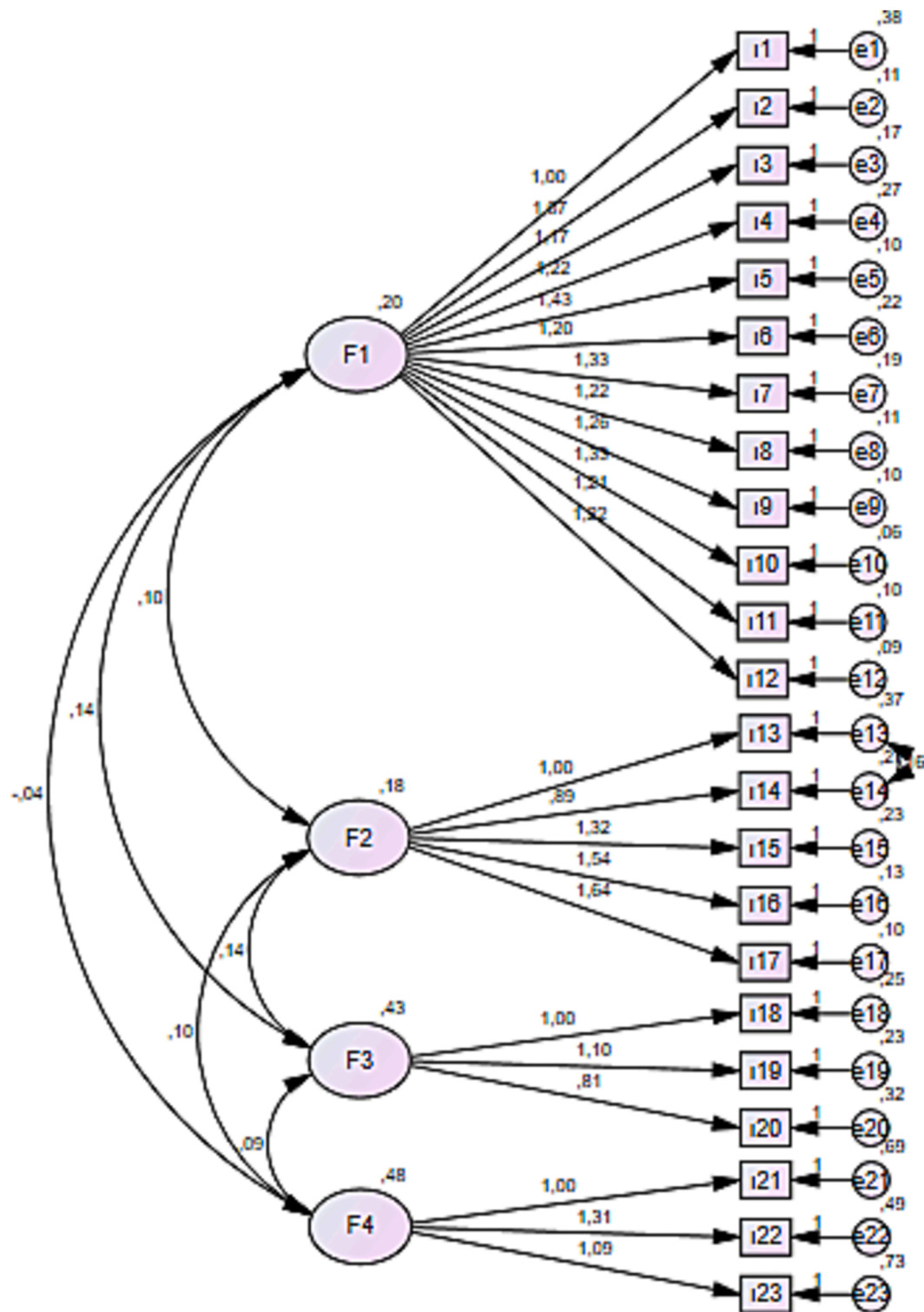

Fig. 1. Scree plot.

Fig. 2. Path diagram according to CFA results.

Discussion

This study aimed to develop SRHKE to evaluate the sexual and reproductive health knowledge levels of nurses in exceptional circumstances. SRHKE showed a four-factor structure, and these four factors explained 65% of the total variance in the measured variable. It had high internal consistency (Cronbach's alpha coefficient values were 0.826 for the 1st factor, 0.814 for the 2nd factor, 0.788 for the 3rd factor, 0.723 for the 4th factor, and 0.896 for the total scale). The item-total score correlation coefficients of SRHKE varied between 0.479 and 0.659. The Pearson's correlation coefficients calculated for the evaluation of the construct validity of the scale ranged from 0.519 to 0.749 ($p < 0.005$).

First, the content validity of SRHKE was assessed in this study. After receiving the opinions of nine experts, the CVR and CVI values of the scale were calculated as 0.78. Considering that the number of experts was nine, the minimum CVR should be 75% [16]. Since the CVR and CVI values of the SRHKE items were over 75%, the content validity of SRHKE was considered significant.

Table 4
Goodness of fit criteria for the scale.

Goodness-of-fit index	Measures	Goodness-of-fit results
Chi-squared/df	Chi-squared/df < 3	2.616
RMSEA	RMSEA < 0.08	0.06
NFI	>0.90	0.91
CFI	>0.95	0.97
GFI	>0.90	0.91
RFI	>0.85	0.86
IFI	>0.90	0.92

RMSEA: Root mean square error of approximation, SRMR: Standardized root mean square residual, NFI: Normed fit index, CFI: Comparative fit index, AGFI: Adjusted goodness of fit index, GFI: Goodness of fit index.

Table 5
Item-total score correlations of the items and reliability coefficients of the scale and its factors.

Item	Factor 1	Factor 2	Factor 3	Factor 4
1	0.572			
2	0.643			
3	0.603			
4	0.654			
5	0.683			
6	0.581			
7	0.605			
8	0.636			
9	0.683			
10	0.692			
11	0.623			
12	0.631			
13		0.634		
14		0.624		
15		0.521		
16		0.607		
17		0.650		
18			0.479	
19			0.499	
20			0.540	
21				0.544
22				0.623
23				0.600
Cronbach's alpha coefficient	0.826	0.814	0.788	0.723
	0.896			

Table 6
Pearson's correlation coefficients for the evaluation of construct validity.

	Factor 1	Factor 2	Factor 3	Factor 4	Total
Factor 1	1	0.637*	0.606*	0.701*	0.671*
Factor 2		1	0.718*	0.700*	0.609*
Factor 3			1	0.702*	0.614*
Factor 4				1	0.749*
Total (test)					1

*$p < 0.005$.

Second, the construct validity of SRHKE was assessed by performing EFA and CFA. Performing both EFA and CFA is essential for testing construct validity in scale adaptation and development studies [23]. In this regard, both KMO and Bartlett's test of sphericity values were examined. A factor analysis could be performed in this study as the KMO value was higher than 0.70, and the result of the Bartlett's test of sphericity was significant [9] (Table 2).

There is a wide range of methods for conducting a factor analysis, including the "maximum likelihood", "minimum residual", "principal axis", "weighted least squares", and "generalized weighted least squares" methods. The principal axis factoring method was used in this study. This method is very similar to principal component analysis, with pre-specified priors consisting of a matrix of squared multiple correlations among variables. The principal axis factoring method is one of the most commonly used methods for EFA [17]. As a result of the EFA, SRHKE was found to have a four-factor structure, and these factors explained 65% of the total variance in the measured characteristic. The accuracy of this construct was evaluated by CFA. Accordingly, the goodness-of-fit indices of SRHKE were quite good [8,10,11,18].

The item-total score correlation coefficients of SRHKE ranged from 0.530 to 0.825. Item-total score correlation provides information about whether an item measures the quality measured by the remaining items of the scale. The lower the item-total score correlation value of the item, the lower its contribution to the scale [7]. Item-total score correlation coefficients should have positive values and be greater than 0.20. Items that do not fulfill this condition should be removed from the scale, and the remaining items, as well as the reliability of the scale with the remaining items, should be checked again [5].

The Cronbach's alpha coefficient was used to determine the internal consistency of SRHKE. Nunnally and Bernstein [21] suggested that if a measurement tool has two or more factors, its Cronbach's alpha coefficient should be calculated for both the total scale and its factors. In this study, the Cronbach's alpha coefficients were found to be 0.826 for the 1st factor, 0.814 for the 2nd factor, 0.788 for the 3rd factor, 0.723 for the 4th factor, and 0.896 for the total scale. These values suggested that SRHKE had high reliability [27]. The higher the Cronbach's alpha coefficient, the more compatible the items in the scale and the more they collaborate to measure the same feature [14].

Disasters are an important public health problem that disrupts the life order of the society and causes loss of life and property. In disaster situations, sexual life and the problems it may cause can be ignored. Therefore, the MISP for SRH in crisis situations was developed by the Inter-Agency Working Group (IAWG) as a set of important, essential and life-saving activities necessary to respond to the SRH needs of affected populations at the onset of the disaster (if possible within the first 48 h) [29,26]. Health discipline nurses, who are always intertwined with the society, are among the groups that need to take precautions regarding sexuality in crisis situations such as natural. While taking precautions, nurses should have sufficient knowledge and equipment about MISP. A measurement tool was developed to determine the knowledge level of nurses about MISP in this current study.

Conclusion

SRHKE, which was developed to evaluate the sexual and reproductive health knowledge levels of nurses in emergencies, has high validity and reliability in Turkey. Therefore, it is recommended that the scale be used to evaluate the sexual and reproductive health knowledge levels of nurses in exceptional circumstances. Its validity and reliability are recommended to be assessed in different cultures and occupational groups.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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