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Ethical Behaviour in Search and Rescue: A Scale Development Research

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ABSTRACT

Objective: The aim of this study was to develop a measurement tool with proven validity and reliability to measure ethical behavior in search and rescue. **Materials and Methods:** The exploratory sequential mixed method was preferred in the study. The first stage started with a qualitative study to create the item pool. Interviews with 16 search and rescue personnel were conducted through semi-structured forms. 38 Items were created. The content validity of the item pool was evaluated through expert opinion. The Lawshe technique was used to evaluate expert responses. Afterwards, the item pool, which was subjected to language and spelling checks, was piloted with 10 participants. After necessary adjustments were made, the draft scale was administered to 330 personnel. **Results:** As a result of the analysis, the scale showed a unidimensional structure consisting of 10 items. The obtained scale was confirmed by confirmatory factor analysis. The reliability of the scale of ethical behavior in search and rescue was evaluated by Cronbach's Alpha and it was determined that the scale had high reliability and internal consistency with 0.95. **Conclusion:** The developed "Ethical Behavior in Search and Rescue Scale" can be applied to all individuals operating in the field of search and rescue.

Keywords: Search and Rescue, Ethics, Scale, Scale Development.

Arama Kurtarmada Etik Davranış: Bir Ölçek Geliştirme Çalışması

ÖZ

Amaç: Bu çalışmanın amacı arama kurtarmada etik davranışı ölçebilecek geçerliliği ve güvenirliliği ispatlanmış bir ölçme aracı geliştirmektir. **Gereç ve Yöntem:** Araştırmada keşfedici ardışık karma yöntem tercih edilmiştir. İlk aşama madde havuzunun oluşturulması için nitel çalışma ile başlatılmıştır. 16 arama kurtarma personeli ile yarı yapılandırılmış formlar aracılığı ile mülakatlar gerçekleştirilmiştir. 38 madde oluşturulmuştur. Madde havuzunun kapsam geçerliliği uzman görüşü ile değerlendirilmiştir. Uzman yanıtlarını değerlendirmede Lawshe tekniği kullanılmıştır. Daha sonra dil ve yazım kontrolüne tabi tutulan madde havuzu 10 katılımcıya pilot olarak uygulanmıştır. Gerekli düzenlemeler yapılan taslak ölçek 330 personele uygulanmıştır. **Bulgular:** Yapılan analizler neticesinde ölçek 10 maddeden oluşan tek boyutlu bir yapı göstermiştir. Elde edilen ölçek doğrulayıcı faktör analizi ile doğrulanmıştır. Arama kurtarmada etik davranış ölçeğinin güvenirliliğini Cronbach's Alpha değerlendirilmiş ve 0.95 ile ölçeğin yüksek güvenirliğe ve iç tutarlılığa sahip olduğunu belirlenmiştir. **Sonuç:** Geliştirilen "Arama Kurtarmada Etik Davranış Ölçeği" arama kurtarma alanında faaliyet gösteren bütün bireylere uygulanabilir.

Anahtar Kelimeler: Arama Kurtarma, Etik, Ölçek, Ölçek Geliştirme.

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INTRODUCTION

Disasters are events that occur suddenly and cause great damage and loss of life (Moore and Lakha, 2006). To cope with disasters, which are unpredictable and complex in nature, it is necessary to manage disasters successfully (GFDRR, 2016). Disaster management literature is replete with frameworks, models and procedures for coping with disasters (Nojavan et al. 2018). Perhaps the most common framework dominating the literature is the disaster management cycle, which includes the mitigation/prevention, preparedness, response and recovery phases (Coppola, 2011; Alexander, 2019). The cornerstone of the disaster management cycle is preparedness (Castillo, 2005). However, after disasters occur, events accelerate rapidly (Moore and Lakha, 2006; Moore, 2008; Coppola, 2011) and then multiple procedures can become constraining and challenging rather than enabling (Son et al., 2008). Intervention activities conducted at this stage play an important role in the management of the disaster management process (Fischbacher-Smith, 2014).

Response activities in disasters include search and rescue, health, food, religious, security, property and environmental protection, social and psychological support services (Holgersson et al. 2016; Jenkins, 2006). However, intervention phases within the traditional disaster management cycle also face various fundamental problems. During a disaster, people react differently according to their cultural characteristics, habits, preparations, beliefs, and often overreactions lead to failure (Pauchant and Mitroff, 1988). Weisaeth (1989). It is argued that during the response phase, search and rescue teams are often faced with extreme stress, an extremely challenging and chaotic environment and often hostile attitudes. Search and rescue teams mean a team consisting of professional personnel who can intervene in disasters and emergencies (Özkar, 2019; AFAD, 2023). Search and rescue teams, which interact directly or indirectly with disasters, play an active role in rescuing people safely and normalizing the flow of life that is delayed in case of a disaster. However, since search and rescue teams are the first to detect changes in the disaster victim's condition, they often face complex problems and challenges that occur in the unexpected situation (Battistuzzi et. al., 2021). Many of these problems and challenges are related to the lack of time, material and capacity in the dangerous, chaotic and pressure-filled conditions in which search and rescue teams must operate. For example, choices about where to concentrate rescue efforts, what risks to take, who to search for first, who should be rescued first, who should be left on hold, and how best to use limited resources are ethically challenging (Gustavsson et. al., 2020). Therefore, there are situations that require ethical decision-making processes in approaching disaster victims (Eryiğit et al., 2012; Gökkaya and Dinç, 2020).

Many researchers in the field of disaster ethics share the view that those most at risk should be prioritized (Merin et. al., 2010; O'Mathuna et. al., 2013). It is observed that behaviours such as approaching individuals waiting for rescue equally and fairly, respecting culture and values and human dignity, compulsory evacuation of the population, giving priority to disadvantaged groups, improving the environment, protecting social ties are among the ethical behaviours in disasters (Zack, 2009; Prieur, 2011; Bilgin, 2013). When a disaster or emergency occurs, the first ethical behaviour expected from search and rescue teams is to reach the scene quickly and start humanitarian aid activities by adhering to common ethical principles (Zack, 2009; Bilgin, 2013). However, researches show that the first condition for displaying correct ethical behaviours in search and rescue operations is to determine what needs to be done before the incident requiring search and rescue and to put them into practice through drills (Özbek, 2011). In addition, during search and rescue operations in any disaster or emergency, it is reported that publishing traumatic images of people directly on social media without filtering them, even with a well-intentioned approach, and reporting locations that will mislead search and rescue teams with malicious intentions are among the unethical approaches (Usta and Yükseler, 2021).

Although ethics has a great importance in terms of search and rescue activities, it is insufficient to address these two issues together in the literature. This may be due to the fact that this field is a specific field, difficulties in reaching the sample group and the difficulty arising from the handling of two different components together. Although there are some studies on ethical approaches to search and rescue activities, which are discussed in an extremely limited area in the literature, there is no measurement tool for ethical behaviours in search and rescue activities.

The aim of this study is to develop a scale of ethical behaviour in search and rescue. It is expected that the scale developed as a result of the study will be useful for public institutions and NGOs operating in the relevant field to select or evaluate search and rescue personnel.

MATERIALS AND METHODS

In this part of the study, the research model, stages of the study, scale item development process, research population, sample, expert opinions, pilot application and data analysis were explained in detail.

Study design

In this study, the exploratory sequential mixed method, which is one of the mixed method research projects, was used. This method involves collecting data through the qualitative method in the first stage to identify the current problem. The data obtained are mostly used to create an item pool for the development of a measurement tool (Creswell, 2021).

Table 1. Research process stages.

Sequence	Stages	Operation
1.	**Creating a substance**	Literature review to create a qualitative interview form
2.		Evaluation of the interview form with expert opinion
3.		Pilot application
4.		Semi-structured interviews
5.		Analysing the interviews
6.		Creation of the scale item pool
7.	**Theoretical analysis**	Obtaining expert opinion
8.		Language control
9.		Pilot testing
10.	**Psychometric analysis**	Sampling application
11.		Validity analyses
12.		Reliability analyses
13.		Scale naming and creating the final scale

In this study, first qualitative and then quantitative studies were conducted in accordance with the method. Scale development studies are basically completed in three different stages. These stages include item generation, theoretical analysis and psychometric analyses (Morgado et al., 2017). The activities conducted within the scope of the research are given in Table 1. In this scale development research, the principles determined by DeVellis (2017) for scale development were followed.

Qualitative phase

Qualitative research was first conducted to determine the items to be included in the scale of ethical behaviour in search and rescue to be developed within the scope of the study. The qualitative study was conducted in a phenomenological design since it was desired to determine the ethical problems experienced by search and rescue personnel and the sources that cause these problems (Patton, 2015). Interviews were used as a data collection method and the semi-structured form was used as a data collection form. The data obtained were managed without prejudice and interpretation.

Data collection instrument

Semi-structured interviews were conducted to determine the feelings, thoughts and ideas of search and rescue personnel regarding the ethical behaviour in search and rescue. In the interviews, ethical issues, problems and dilemmas encountered by search and rescue personnel during search and rescue in the field were analysed. The form used to collect data in the interviews was developed as a result of the literature review and consists of three parts. The first part consisted of 3 items containing information about the interview, the second part consisted of 6 items questioning the demographic information of the participants, and the third part consisted of 5 open-ended, semi-structured questions questioning the ethical problems encountered in search and rescue. As a result of the feedback and comments received from the specialists, necessary arrangements were made in the form and the form was finalised.

Sample and data collection process of the study

To select the people who can give the most accurate and best answer to the questions determined in the study, the sample was determined by purposeful sampling. In addition, to collect the most diverse answers to the research question, maximum diversity sampling within purposive sampling was preferred. In this context, data were collected through semi-structured interviews from 16 search and rescue personnel who met the sampling criteria and volunteered to participate in the research. Participants were informed about the study before the interviews and the process about the confidentiality of the data was explained. All interviews were audio recorded with the consent of the participants. Interviews continued until data saturation was achieved. It was determined that the data were repeated in the 14th participant. After interviewing 2 more participants to check data sufficiency, the interviews were completed. Nine of the interviews were conducted face-to-face and seven of them were conducted via online programs. The shortest interview lasted 21.18 minutes and the longest interview lasted 34.30 minutes ($\bar{x}$=25.40). In the interviews, the participant was expected to end the interview. However, it was ensured that the conversation did not get too distracted with interventions in conversations that could shift to off-topic or different areas.

Data analysis and findings

Qualitative data analysis was conducted through the data collection process (Maxwell, 2018). In data analysis, firstly, familiarity with the data was ensured by listening to the data obtained repeatedly. In this study, instead of transcribing the entire data, transcription was made on the voice recording. The voice recordings were listened to repeatedly and important points were noted, and the item formation process was conducted. While creating the draft item, the data obtained from the participants were used as much as possible without any interpretation. The statements of the participants were tried to be written directly as items. In addition, similar expressions stated by more than one participant were combined into a single item. From the data obtained from the

interviews, 38 draft items that can be used in the measurement tool were formed.

Quantitative phase

At this stage, the validity and reliability analyses of the scale item pool formed from the data obtained in the qualitative phase were carried out. Detailed information about each process is listed below.

Expert opinion for the item pool

The high content validity of the scales increases the success of that scale in measuring the construct to be measured at the same rate. The most practical way to achieve this is to apply for expert opinion. Expert opinion provides important information in terms of items that need to be corrected or deleted in the determined structure (Doğan & Doğan, 2019). In this context, the item pool created after the qualitative phase was first submitted to specialist opinion. During the specialist opinion process, 6 field specialists were consulted. All the specialists were PhD graduates, had previously conducted scale development studies and had research and publications on disaster and disaster management. During the process of obtaining specialist opinions, e-mails were sent to the field specialists explaining the purpose and method of the study and asking them to evaluate the scale items. The specialists were asked to evaluate the sent items in a triadic structure in accordance with the Lawshe technique as appropriate, should be corrected and not appropriate. In addition, they were asked to make explanations next to the items for the items that they stated to be corrected. The results obtained were evaluated in two stages in accordance with the Lawshe technique. In the first stage, for an item to remain in the scale pool, more than 50% of the specialists should mark the appropriate option for that item. When calculating this ratio, called the Coverage Validity Ratio (CVR), the formula $CVR = \frac{Nu}{N/2} = -1$ is used. In the next stage, the Content Validity Index (CVI) of the remaining items in the item Table 2**.** demographic characteristics of the participants

pool is calculated. CVI is calculated by dividing the average CVI of the remaining items in the pool by the number of items. CVI is determined as CVİ=$\frac{\sum CVR}{MS}$ (Lawshe, 1975). In this study, after the specialist evaluations, 17 items with CVR ≤0 were eliminated and the CVI of 21 items was evaluated. The CVI for 6 specialists is 0.99 (Alpar, 2020). Since the CVI values of the remaining 21 items were in the appropriate range, it was accepted that the content validity of the 21 items in the item pool was ensured.

Language check and pilot testing

Before the items were put into practice, an academic specialized in the field of grammar and literature was consulted to purify the items in terms of comprehensibility, punctuation, etc. Detected errors and marking mistakes were corrected. Before applying the scale to the determined sample, a pilot test was conducted in the form of an online form to 5 female and 5 male search and rescue personnel who met the sampling criteria. In this way, the access error that may occur in the online form or the incomprehensible, incomplete, erroneous points in the scale were checked for the last time. After the corrections made, the scale was ready to be applied to the sample.

Table 2. Data collection tools and data collection process.

Variable	Group	n	%
Gender	Woman	137	41.5
	Men	193	58.5
Age	18-22	113	34.2
	23-30	94	28.5
	30-40	105	31.8
	40+	18	5.5
Education Status	High school	39	11.8
	Associate degree	191	57.9
	Faculty	79	23.9
	Postgraduate	21	6.4
Type of Institution	Public	203	61.5
	Ngo	127	38.5
Marital Status	Married	145	43.9
	Single	185	56.1
Income	Low	97	29.4
	Middle	179	54.2
	High	54	16.4
Total		330	100.0

Sampling and data collection process

In this study, the purposive sampling method, which is one of the non-random sampling methods, was used. Data were collected from search and rescue personnel working in Türkiye for this purpose. The criteria for inclusion in the sample were determined as: volunteering to participate in the study and working

as search and rescue personnel. Deciding on the sample size has an important place in developing measurement tools. While some researchers state that 300 participants will be sufficient for scale development studies in general (DeVellis, 2017), some researchers state that 5 times the number of scale items (Hatcher, 1998) and some researchers state that 10 times the number of scale items should be reached (Akgül, 1997). In this study, data were collected from 330 search and rescue personnel to meet many different criteria in the literature (330/21=15.7). Table 2 presents the demographic information of the sample from which data were collected.

The data collection tool used in the quantitative data collection process consisted of three parts. The first part consisted of a demographic information form consisting of six questions questioning the demographic information of the sample, the second part consisted of the scale item pool containing 22 items created within the scope of the study, and the last part consisted of the scale of predisposition to ethical values used to determine the criterion validity of the scale. The scale of ethical behaviour in search and rescue created within the scope of the study was designed in as a 5-point Likert (1: Strongly Disagree, 2: Disagree, 3: Undecided, 4: Agree, 5: Strongly Agree). In the data collection process of the study, the online forms were sent to the people eligible for sampling via e-mail and social media tools. To reach a sufficient amount in this process, help was received from the managers of the organisations and team leaders working in disaster response. Within the scope of the research, the data collection process was conducted twice. Firstly, EFA analysis of the study was conducted with the data obtained at the end of the data collection process in which 330 participants participated. For the CFA of the scale created after the first stage, data were collected from 161 search and rescue personnel who met the inclusion criteria. The data were collected between 13.01.2024-13.02.2024. Since answering all questions and items in the data collection tool was compulsory, there was no missing data.

Data analysis

The data analysis of the study was conducted in three different stages: demographic data analysis, validity analyses and reliability analyses. Demographic data of the participants are presented in Table 2. Validity analyses consisted of content validity, normality test, EFA and CFA. Finally, Item Analysis, Alpha Coefficient (Cronbach's Alpha) tests were used in reliability analyses. SPSS 21 programme was used for Exploratory Factor Analysis (EFA), reliability analysis, etc. and AMOS 24 programmes were used for CFA.

Ethical considerations

The ethical permission required to conduct the study was obtained from the Kayseri University Scientific Research and Publication Ethics Board (dated: 09.10.2023, numbered: 74167). However, informed consent was obtained from all participants before the qualitative and quantitative study was initiated. The participants were informed that they may want to withdraw from the study and that their data would not be included in the study in line with their requests.

RESULTS

To determine the item distributions and dimensions created within the scope of the study, EFA should be performed. In this context, the data were analysed in terms of normality, missing data and sample size. Firstly, the normal distribution of the data obtained in the study was analysed. In this context, since the skewness and kurtosis values of the data were ±1.5, it was accepted that the data were normally distributed (Tabachnick & Fidell, 2013). When the data set was analysed, it was determined that there was no missing data. The suitability of the sample size for factor analysis was checked by Kaiser Meyer Olkin (KMO) test. For the sample to be adequate, the KMO value must be above 0.80. Bartlett Sphericity Test is used to determine whether the data collected within the scope of the study show diversity. The p value of the Bartlett's test should be less than 0.05 (Alpar, 2020). The KMO test of the data set obtained in this study was determined as .936 and the Bartlett Sphericity Test result was determined as $p<.000$. These values revealed that the data set was suitable for factor analysis.

In the factor analysis, "Principal Component Analysis" was preferred as the factor derivation method and "Direct Oblimin" as the rotation method. Rotation methods are basically divided into orthogonal and oblique rotations. Orthogonal rotations should be preferred in cases where no relationship between factors is expected, while oblique rotations should be preferred in cases where there is a relationship between factors. Oblique rotation is divided into Promax and Direct Oblimin. The Promax rotation method is preferred for analyzing large data. For these reasons, the direct oblimin method, which is the most appropriate rotation method, was preferred in this study (Tabachnick & Fidell, 2001). In factor analysis, item overlapping items and factor loadings were examined. Items with factor loadings below 0.33, overlapping items and items with a difference of less than .1 should be eliminated (Can, 2022). After EFA, since there were no overlapping items and items with factor loadings below 0.33, no item removal was performed. As a result of the EFA analysis, a structure consisting of 3 dimensions and explaining 71.30% of the total variance was formed. The factor structure obtained after EFA is presented in Table 3.

Table 3. Factor structure after EFA.

Item No	Items	Dimensions		
		1	2	3
2.	I give priority to babies and children in search and rescue even if it is more difficult and takes longer to rescu them. (reverse)			0.872
3.	In search and rescue, I give priority to the elderly, even if it is more difficult and takes longer to rescue ther (reverse)			0.906
4	I give priority to disabled people in search and rescue even if it is more difficult and takes longer to rescu them. (reverse)			0.917
6.	In search and rescue, I give priority to people with whom I have the same views (religious, political, etc even if it is more difficult and takes longer to rescue them. (reverse)		0.652	
12.	I do not share private images of disaster victims on social media.	0.847		
13.	I do not share special situations that I witnessed in search and rescue that would harm the personal privacy	0.861		
14.	I do not take unauthorised footage in search and rescue.	0.766		
15.	I am not engaging in search and rescue because of the smell of the bodies. (reverse)		0.901	
16.	I do not intervene in some disaster victims due to the risk of infectious diseases. (reverse)		0.860	
17.	In search and rescue, I act with my knowledge and experience, not with my emotions.	0.754		
19.	I consider intervention to disaster victims more important than my own health. (reverse)		0.523	
21.	I do not give information about search and rescue to the press without authorisation.	0.865		
22.	The beliefs of the people I search and rescue do not affect me.	0.874		
23.	The race of the people I search and rescue does not affect me.	0.857		
24.	The fact that the area where I do search, and rescue is in a foreign country does not affect my efforts.	0.823		
25.	I consider the cultural characteristics of disaster victims in search and rescue.		-0.75	
26.	I respect people's beliefs in search and rescue.	0.855		
27.	I act in accordance with the laws and rules of the region where I perform search and rescue.	0.774		
28.	In search and rescue, I avoid any practice that may harm disaster victims.	0.830		
31.	I deliver the valuables I find in search and rescue to the necessary units.	0.862		
32.	I respect the privacy of people in search and rescue.	0.874		

The item total correlation was analysed to determine the internal consistency of the scale structure. Item total correlation is important in terms of reliability. These data show the relationship between each item in the scale and the whole scale. In order not to damage the summability of the scales, it is necessary to pay attention that the item-total correlation cannot be negative or below .20 (Karagöz & Bardakçı, 2020). As a result of the analysis, 11 items with an item-total correlation below .20 were deleted. As a result of the item deletion process, a 10-item structure was reached. In this process, the item deletion process was conducted by deleting the item with the lowest value, then repeating the analysis and deleting the item with the lowest value again. The analysis process was finalised when there were no items with an item-total correlation below .20. The item-total correlation table of the formed scale is given in Table 4. The items in the new structure have a positive correlation between r=0.71 and r=0.84.

Table 4. Draft scale item-total correlation.

Item	Scale mean if item deleted	Scale variance if item deleted	Corrected item-total score correlation	If item deleted Cronbach's alpha
Item13	37.61	65.437	0.827	0.946
Item14	37.76	66.632	0.726	0.950
Item17	37.82	66.974	0.721	0.951
Item22	37.68	64.867	0.839	0.946
Item23	37.71	64.710	0.834	0.946
Item24	37.75	65.522	0.780	0.948
Item27	37.79	66.245	0.752	0.949
Item28	37.68	65.840	0.815	0.947
Item31	37.56	66.345	0.813	0.947
Item32	37.68	64.181	0.848	0.945

Table 5. Finalised factor structure of the scale.

Item	Factor load
Item13	0.862
Item14	0.777
Item17	0.772
Item22	0.875
Item23	0.870
Item24	0.825
Item27	0.800
Item28	0.854
Item31	0.853
Item32	0.883

Since the deletion of the items in the factor structure obtained previously as a result of the item-total correlation analysis may change the factor structure, EFA was repeated. In EFA, the Principal Component Analysis was used as the analysis method and the Direct Oblimin method was used as the rotation method. Since there were no overlapping items and items with factor loadings below .33, no item removal was performed at this stage. The scale factor structure obtained after the last EFA is presented in Table 5. The new structure obtained was a single-factor structure explaining 70.22% of the total variance. In scale development studies, the total variance is required to be above 40% (Bursal, 2019). The variance value reached in this study was found to be sufficient, well above this value. The total variance explained of the developed scale is given in Table 6.

Table 6. Total variance explained.

Item	Initial eigenvalues			Total extraction of squared loads		
	Tot	% of varianc	Cumulative %	Total	% of variance	Cumulative %
1	7.022	70.224	70.224	7.022	70.224	70.224
2	0.593	5.935	76.159			
3	0.508	5.084	81.243			
4	0.479	4.786	86.029			
5	0.366	3.655	89.684			
6	0.291	2.911	92.595			
7	0.238	2.375	94.970			
8	0.181	1.810	96.779			
9	0.164	1.641	98.421			
10	0.158	1.579	100.00			

The scale structure formed as a result of the analyses was evaluated with CFA. To verify the obtained model, data were collected again from different participants suitable for the sample. Like the previous data collection process, data collection was conducted by sending the online form to the appropriate people via e-mail and social media applications. At this stage, a total of 161 participants were reached (161/10=16.1). In the CFA research, 57.8% of the participants were male, 33.6% were between the ages of 23-30, and 58.1% were search and rescue personnel working in the public sector. The Maximum likelihood calculation method was used due to the normal distribution of the data obtained. The model of the analysis is given in Figure 1.

In the CFA analysis of this study, r (X^2/df (chi-square/degree of freedom)=<5, Comparative Fit Index (CFI)=≥0.90, Goodness of Fitness (GFI)=≥0.85, Incremental Fit Index (IFI)=≥ 0.90, Turker-Lewis Index (TLI)=≥ 0.90, Root Mean Square Error of Approximation (RMSEA)=<0.10) values (Browne & Cudeck, 1989; Erkorkmaz et al, 2013; Kline, 2011). After the CFA process, it was determined that the data did not meet the goodness of fit values accepted in the literature. After this situation, item factor loadings were analysed first. However, since the item factor loadings were higher than <0.50 for all items, item removal was not performed. In the next process, modification indices of the model were analysed. Covariance was made between the items with the highest values. After the covariance, the analysis process was repeated, and the goodness of fit values were checked. This process was completed after the fourth covariance, and it was determined that the scale model reached the goodness of fit values. Specialist opinions were taken for the covariances

made and information was obtained about the accuracy of the process. After the procedures, the goodness of fit values of the scale model were determined as $X^2/df=3.343$, CFI = 0.975, GFI = 0.942, IFI = 0.975, TLI = 0.964 and RMSEA =<0.84.

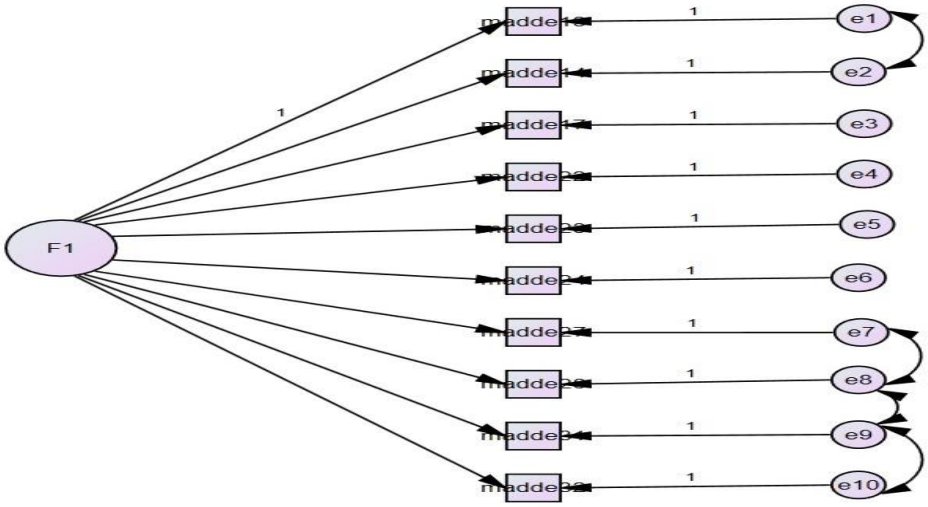

Figure 1. CFA diagram of ethics in search and rescue scale.

The Internal consistency (Cronbach's Alpha) test was performed to evaluate the reliability of the scale of ethical behaviour in search and rescue. A Cronbach's alpha value above 0.70 in scales shows high reliability (Can, 2022).

The Cronbach's alpha value of 0.95 indicates that the scale has high reliability and internal consistency (Table 7).

Table 7. Cronbach Alpha coefficient of the ethical behaviour scale in search and rescue.

Cronbach's alpha	Item number
0.952	10

The final version of the Ethical Behaviour in Search and Rescue Scale (EBSARS), for which validity and reliability studies were conducted, is presented in Table 8. The developed scale consists of one dimension and 10 items. The scale was designed in a 5-point Likert. The scale is designed in 5-point Likert type. It is scored in the range of Strongly Disagree (1), Strongly Agree (5). There are no reversely coded items in the scale. The highest score that can be obtained from the scale is 50 and the lowest score is 10. The scale can be applied to all individuals who perform search and rescue activities in any way, regardless of public, private or NGO.

Table 8. Finalized version of the EBSARS.

Sequence	Item Content	Strongly Disagree(1)	Disagree (2)	Undecided (3)	Agree (4)	Strongly Agree (5)
1.	I do not share special situations that I witnessed in search and rescue that would damage personal privacy.					
2.	I do not take unauthorised footage in search and rescue.					
3.	In search and rescue, I act with my knowledge and experience, not with my emotions.					
4.	The beliefs of the people I search, and rescue do not affect me.					
5.	The race of the people I search, and rescue does not affect me.					
6.	The fact that the area where I do search, and rescue is in a foreign country does not affect my efforts.					
7.	I act in accordance with the laws and rules of the region where I do search and rescue.					
8.	In search and rescue, I avoid any practice that may harm disaster victims.					
9.	I deliver the valuables I find in search and rescue to the necessary units.					
10.	I respect the privacy of people in search and rescue.					

DISCUSSION

The destruction caused by disasters, which can destroy the life streams of societies and cause high loss of life and property, causes many problems (AFAD, 2014; UNISDR, 2009). Search and rescue operations conducted from the first moment of disasters involve extremely difficult and severe conditions. This period brings extremely difficult psychological and physical conditions such as intense workload, witnessing many deaths and traumatic cases. These conditions have the possibility to affect the decisions of many employees working in the field. Failure of the personnel to act in accordance with ethical rules in search and rescue activities may lead to injury, death or a psychological problem that will cause great traumas for the disaster victim. Due to these situations, ethical behaviour of search and rescue personnel is important both for themselves and the disaster victim.

It is observed that studies in the field have focused on the use of robots or technology in search and rescue, factors affecting the success of search and rescue teams, or the psychological state of search and rescue teams (Drew, 2021; Öztürk & Kuday, 2024; Statheropoulos et al., 2015). However, there are no scale development studies in the field. The aim of this study is to develop a valid and reliable scale that can measure ethical behaviour in search and rescue. The exploratory sequential mixed method was preferred as a method to develop the intended scale. In this context, a qualitative study constituted the first phase of the research. In the qualitative study, semi-structured interviews were conducted with 16 search and rescue personnel. The qualitative interviews obtained were analysed and the

expressions that could be used as items in the scale were determined. In this process, care was taken to use the participant expressions without changing them as much as possible. As a result of the analysis, 38 draft items were formed.

The created scale item pool was submitted to expert opinion. The responses from the experts were evaluated with the Lawshe technique. At this stage, 17 items were deleted from the item pool. The remaining 21 items were first subjected to pilot application. Afterwards, it was checked for language and spelling. The item pool, which was found suitable for data collection, was applied to 330 participants consisting of search and rescue personnel, who met the sampling criteria. During the data collection process, 15.7 participants were reached for each item. In the analysis of the data, firstly, KMO and Bartlett tests were performed to determine the suitability of the scale for factor analysis. The tests showed that the data set was suitable for factor analysis. The item pool was subjected to EFA to determine the factor structure of the draft scale. The 21-item draft scale showed a structure consisting of 3 factors. To determine the internal consistency of this scale structure, the scale item-total correlation was analysed. In these analyses, 11 more items with negative or below .20 item-total correlations were removed from the scale and 10 items remained. The EFA repeated after the deletion of the items showed a unidimensional structure explaining 70.22% of the total variance.

CFA was conducted to verify the factor structure of the scale whose factor structure was determined by EFA. In this process, a new data collection process was conducted. For CFA, data were collected again for the 10-item scale from 161 participants who met the sample criteria consisting of search and rescue personnel. At this process, the number of participants per item was again above 15. In the CFA process, the necessary modification procedures were performed to fit the goodness of fit values of the model and the scale achieved goodness of fit values (x2/df=3.343, CFI = 0.975, GFI=0.942, IFI=0.975, TLI=0.964 and RMSEA=<0.84). As a result of the analyses, a single dimension "Ethical Behaviour in Search and Rescue" scale consisting of 10 items was obtained. The reliability of the scale was evaluated with Cronbach's Alpha. The Cronbach's Alpha value of the scale showed that it has a high reliability level with 0.95.

Limitations and Strengths

This study has some limitations. In qualitative research, the purposefulness of the sample from which data are collected and the size of the group from which data are collected are limitations. In addition to these, the data obtained in qualitative interviews are limited to what the individuals stated to the researcher and the knowledge and experience of the researchers were effective in evaluating the data. These situations show that the data obtained cannot be generalised. Another limitation is the application of the study in a specific culture. Using and analysing the scale in different cultures can improve the scale.

CONCLUSION

As a result of the analyses and evaluations made, the Ethical Behaviour in Search and Rescue Scale can provide a measurement and evaluation of possible ethical dilemmas that search, and rescue personnel may encounter during search and rescue activities.

As a result, the Ethical Behaviour in Search and Rescue Scale has a structure consisting of 10 items and one dimension. It is a valid and reliable tool that can measure ethical behaviour in search and rescue in Turkish culture. The scale is designed in a 5-point Likert. It is scored in the range of Strongly Disagree (1), Strongly Agree (5). There are no reversely coded items in the scale. The highest score that can be obtained from the scale is 50 and the lowest score is 10. The scale can be applied to all individuals who perform search and rescue activities in any way, regardless of public, private or NGO. A high score on the scale indicates that the person complies with ethical principles more, while a low score indicates that the person has adopted ethical principles sufficiently.

Conflict of Interest

On behalf of all authors, the corresponding author declares no conflict of interest.

Author Contributions

Plan, design: ÖD, EG; **Material, methods and data collection:** ÖD, EG; **Data analysis and comments:** ÖD, EG; **Writing and corrections:** ÖD, EG.

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Ethical Approval

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