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Fatalism Scale for Occupational Accidents and Diseases: A Scale Development Study

İş Kazası ve Meslek Hastalıklarına Yönelik Kadercilik Ölçeği: Ölçek Geliştirme Çalışması

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It is declared that scientific and ethical principles have been followed while carrying out and writing this study and that all the sources used have been properly cited (Metin Yıldız vd.).

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Öz

İşyerlerinde çalışanların iş kazaları ve meslek hastalıklarına karşı tutumlarını ve bu olayların kaçınılmaz veya kontrol dışı olarak algılanıp algılanmadığının belirlenmesi önem arz etmektedir. İş kazaları ve meslek hastalıklarına yönelik kadercilik algısının doğru yorumlanmaması daha fazla iş kazası ve meslek hastalığı görülmesine neden olabilmektedir. İş kazaları ve meslek hastalıkları bağlamında kadercilik algısının belirlenmesi için ölçeklerin kullanımı, bu konuların nicel olarak değerlendirilmesine olanak sağlamaktadır. Bu yaklaşım, kadercilik algısının objektif bir biçimde ölçülmesini ve analiz edilmesini mümkün kılmakta olup, böylece ilgili fenomenlerin daha derinlemesine incelenmesine zemin hazırlamaktadır. Bu çalışma iş kazası ve meslek hastalıklarına yönelik kadercilik düzeyini belirlemek amacıyla yapılmış bir ölçek geliştirme çalışmasıdır.

Metodolojik türde yapılan bu çalışma, Ekim 2021-Haziran 2023 tarihleri arasında yürütülmüştür. Literatürden yararlanarak hazırlanan ölçek maddeleri için uzman görüşü alınarak şekillendirilmiş, ön uygulaması yapılmış ve pilot uygulaması 75 kişiyle, Açımlayıcı Faktör Analizi ve Doğrulayıcı Faktör Analizi 242 kişiyle yapılmış, geçerlilik ve güvenilirlik analizleri ile değerlendirilmiştir.

Geliştirilen iş kazası ve meslek hastalıklarına yönelik kadercilik ölçeği için açımlayıcı faktör analizinde ölçek maddelerinin 4 faktör altında toplandığı ve açıklayıcılık katsayısının %53.68 olduğu görülmüştür. Ölçeğe yönelik açımlayıcı faktör analizinin uygulanabilirliğinin ölçümü için KMO değeri 0.854; Bartlett's Küresellik Testi değeri ise $\chi 2$=1996.527; df=153, p<.05 bulunmuştur. Ölçeğin Doğrulayıcı Faktör Analizinde anlamlı bulunmuştur (X^2/df= 2.044 RMSEA=.066, AGFI=.858, IFI=.931, TLI=.916, GFI=.894, ve CFI=.930). Uyum indekslerine bakıldığında, ölçeğe ait uyum indekslerinin iyi uyum ve kabul edilebilir uyum indeksi değerleri arasında olduğu sonucuna ulaşılmıştır. Cranbach Alpha değerine göre ölçeğin iç tutarlık katsayısının 0.81 olduğu görülmüştür.

İş kazası ve meslek hastalıklarına yönelik kadercilik düzeyini belirlemek amacıyla geliştirilen ölçek, geçerlilik ve güvenilirliği yüksek bir ölçektir. 18 maddeden oluşan ölçek 5'li Likert tipi bir ölçektir ve 4 alt boyuttan oluşmaktadır. Ölçeği yanıtlayan kişinin alabileceği en yüksek puan 90, en düşük puan ise 18'dir. Bu ölçek, özellikle işyerinde anlık gelişen iş kazaları veya işin yürütümü sırasında ve işin yürütümüne bağlı olarak ortaya çıkan meslek hastalıklarına ilişkin kaderci algıların belirlenmesine katkı sağlayacaktır.

Anahtar Kelimeler: Sosyoloji, Sağlık Sosyolojisi, Kadercilik, İş kazaları, Meslek hastalıkları.

Abstract

It is important to determine the attitudes of employees towards occupational accidents and diseases and whether these events are perceived as inevitable or out of control. Inaccurate interpretation of the perception of fatalism towards occupational accidents and diseases may lead to more occupational accidents and diseases. The use of scales to determine the perception of fatalism in the context of occupational accidents and diseases allows for a quantitative assessment of these issues. This approach makes it possible to objectively measure and analyze the perception of fatalism, thus paving the way for a more in-depth examination of related phenomena. This study is a scale development study to determine the level of fatalism towards occupational accidents and diseases.

This methodological study was conducted between October 2021 and June 2023. The scale was shaped by taking expert opinions for the scale items prepared by making use of the literature, pre-applied and pilot applied with 75 people; Exploratory Factor Analysis and Confirmatory Factor Analysis were conducted with 242 people; and all evaluated with validity and reliability analyzes.

In the exploratory factor analysis for the developed scale of fatalism towards occupational accidents and diseases, it was seen that the scale items were gathered under 4 factors and the explanatory coefficient was 53.68%. In order to measure the applicability of exploratory factor analysis for the scale, KMO value was 0.854 and Bartlett's Test of Sphericity value was $\chi 2$=1996.527; df=153, p<.05. Confirmatory Factor Analysis of the scale was also significant (X^2/df= 2.044, RMSEA=.066, AGFI=.858, IFI=.931, TLI=.916, GFI=.894, and CFI=.930). Considering the fit indices, it was concluded that the fit indices of the scale were between good fit and acceptable fit index values. According to Cranbach Alpha value, the internal consistency coefficient of the scale was 0.81.

The scale developed to determine the level of fatalism towards occupational accidents and diseases has a high validity and reliability. Consisting of 18 items, the scale is a 5-point Likert-type scale and consists of 4 sub-dimensions. The highest score that the respondent can get is 90 and the lowest score is 18. This scale will contribute to the determination of fatalistic perceptions about sudden occupational accidents in the workplace or work-related diseases caused by the nature of the work or its environment risk factor.

Keywords: Sociology, Sociology of Health, Fatalism, Work accidents, Occupational diseases.

Introduction

Considering that one spends an average of one-third of the day at work throughout all their lives, it is possible to argue that the individual may encounter various dangers that may arise from the work environment[1]. Negative situations in the work environment, the nature of the work, the pressures on the employee arising from the social environment and the fact that the executive mechanism does not place an emphasis on the employee may cause significant physical and psychological problems for the employees. These types of problems usually manifest in the form of work accidents and occupational diseases and ultimately impose several material and moral responsibilities on the enterprise, employee and the government[2].

An occupational accident, as characterized by the International Labor Organization (ILO), refers to an unexpected and unintended incident that, if it transpires, will result in specific harm and injury[3]. On the other hand, disorders that the employee may encounter depending on the factors in the workplace while performing their duties are defined as occupational diseases. In order to be able to talk about an occupational disease, there should be multiple and long-term exposure to the factors that will trigger the disease in the work environment[4].

Preventing unsafe situations and acts are significant measures in terms of reducing occupational accidents and occupational diseases[5]. However, a recent fatalistic perception has come to the fore, suggesting that safety measures will not be sufficient to prevent occupational accidents and that occupational accidents are inevitable[6]. Fatalism is defined by expressions such as unconditional acceptance of what has happened and learned helplessness. It is related to concepts such as patience and resilience and is more likely transferred to young individuals in societies where traditional culture is dominant. The relationship between the confession of the dangerous risks attributable to the work environment by the employees and fatalism has been the subject to various researches and it has been acknowledged that fatalistic perceptions may vary based on industries[7]. Being able to measure the perception of fatalism will improve the productivity of employees by positively affecting occupational accidents and occupational diseases. For this reason, a measurement instrument that will measure the level of fatalistic perception towards

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1 Yıldız Köse, *Hastanelerde Çalışan Hemşirelerin Iş Sağlığı Ve Güvenliği Konusundaki Bilgi Ve Farkındalık Düzeylerinin Değerlendirilmesi* (İstanbul: İstanbul Gelişim Üniversitesi, Sosyal Bilimler Enstitüsü, Yüksek Lisans Tezi, 2016).

2 Cansu Karabiber vd., "Bir Tıp Fakültesi Hastanesi Sağlık Çalışanlarında İş Sağlığı-Güvenliği Durumu Ve Risk Faktörleri", *Sağlık Bilimleri ve Meslekleri Dergisi* 5/3 (Ekim 2018), 367-375..

3 Ömer Rıfkı Önder vd., "Ankara Numune Eğitim Ve Araştirma Hastanesinde Çalişan Hekim Ve Hemşirelerin Geçirdikleri İş Kazalari Ve Meslek Hastaliklari Yönünden Değerlendirilmesi", *Ankara Sağlık Hizmetleri Dergisi,* 10/1 (Haziran 2011), 31-44..

4 Nazmi Bilir, . "Meslek hastalıkları tanı, tedavi ve korunma ilkeleri", *Hacettepe Tıp Dergisi*, 42/4 (2011) 142-157.

5 Rahime Ezgin, *İşçi Sağlığı Ve Iş Güvenliği Kavramının Irdelenmesi Ile Otomotiv Sanayinde Işçi Sağlığı Ve Iş Güvenliği Uygulamaları Üzerine Bir Araştırma (*İstanbul: Marmara Universitesi, Sosyal Bilimler Enstitüsü, Yüksek Lisans Tezi, 1995).

6 Yasin Uzuntarla - Fatma Uzuntarla, "The Fatalism Approaches According To The Frequency Of Occupational Accidents And Other Sociodemographic Characteristics Of Health Workers", *Turkish Journal of Family Medicine and Primary Care*, 13/2 (Haziran 2019) 151-158.

7 Öznur Yavan, "The Influence of Perceived Risk and Fatalism on Job Security Perception in Underground Mining", *Karaelmas Journal of Occupational Health and Safety,* 1/1 (Aralık 2017) 58-64; Esparza, 2015.

occupational accidents and occupational diseases is thought to significantly contribute to the literature. At the end of the literature review, we found some scales that can be associated with the fatalistic perception[8], however we could not find a specific scale that could exclusively measure the levels of fatalistic perception towards occupational accidents and occupational diseases. Accordingly, this research aims to develop a standard scale that will exclusively measure the levels of fatalistic perception towards occupational accidents and occupational diseases.

There is no scale of fatalism towards occupational accidents and occupational diseases in the literature and it will shed light on the literature with adaptations in both national and international literature.

1. Methods

This methodological research, which was conducted between October 2021 and June 2023, aimed to develop a Fatalism Scale to determine the level of fatalistic perceptions of individuals towards occupational accidents and occupational diseases. The study was conducted with individuals living in the province of Ağrı through an online scale form. The study group of the research comprised of 242 people reached by random sampling method. The descriptive statistics of the study group are presented in Table 1.

Table 1 data revealed that 153 (63.2%) of the 242 participants were female and 89 (36.8%) were male.

Table 1. Descriptive statistics with regard to the research sample

		Pre-test		EFA-CFA	
		f	%	f	%
Gender	Male	34	45.3	89	36.8
	Female	41	54.7	153	63.2
Total		75	100	242	100

The literature review demonstrates that there is a diversity of opinions and approaches concerning the determination of the appropriate sample size for conducting factor analysis in the process of developing scales. This variation in viewpoints highlights the complexity and nuances involved in deciding how large a sample should be to ensure the reliability and validity of factor analysis, a key statistical technique used in the construction and validation of measurement scales. Such a range of perspectives suggests that the choice of sample size may depend on various factors, including the nature of the data, the number of variables being analyzed, and the specific

[8] Oscar Esparza, "Simultaneous Development Of a Multidimensional Fatalism Measure In English And Spanish", *Current Psychology*, 34 (September 2015) 597-612; Leonard Egede - Charles Ellıs, "Development and psychometric properties of the 12-item diabetes fatalism scale", *Journal Of General İnternal Medicine*, 25 (November 2010) 61-66; Gulruz Bobov - Canturk Capık, "The reliability and validity of the religious health fatalism scale in Turkish language", *Journal of religion and health*, 59/2 (November 2020) 1080-1095.

objectives of the scale development project. This complexity underscores the importance of careful consideration and expert judgment in selecting a sample size that balances statistical rigor with practical feasibility. Bryman and Cramer (2001), for instance, suggested that the sample size in the factor analysis step should be five or ten times the number of items[9]. In this study, 242 participants were selected, adhering to the criterion of having at least ten times the number of items in the scale. This approach ensured that the sample size was adequate for validating the reliability and accuracy of the study's findings.

1.1. Data Collection Instrument

Scale items were scored as Strongly Disagree=1, Disagree =2, Neither Agree nor Disagree=3, Agree =4, Strongly Agree = 5. The highest and the lowest score that the person who answered the scale can get is 90 and 18 respectively. Collected data were analyzed with SPSS 22.0 and AMOS 24.0 softwares.

For the purpose of this scale development study, first a literature review was conducted aiming to determine whether there was an existing scale related to the subject. Thereafter a 5-point Likert-type item pool consisting of a total of 20 items was prepared. Prepared items were then reviewed by 10 faculty members who are experts in the field, two scale development experts and two Turkish language teachers for fluency in Turkish. In line with the feedback received from the experts, 2 items were rephrased to suit the target audience.

Content validity ratio (CVR) was calculated for each item in the scale. The content validity index (CVI) was determined by averaging the calculated CVIs. Lawshe technique was used for this purpose. According to this technique, a CGI above 0.80 is considered appropriate in terms of content validity. The Turkish form was reviewed for language and content validity by 10 academic experts in the fields of health sciences and theology and working in different institutions. In this context, the items were evaluated by the experts. As a result of the review by the experts, the CGI value was found to be 0.90.

The path followed for the scale development process is exhibited in Figure 1.

[9] Duncan Cramer - Alan Bryman, "Quantitative data analysis with SPSS Release 10 for Windows: a guide for social scientists", *Routledge,* (2001).

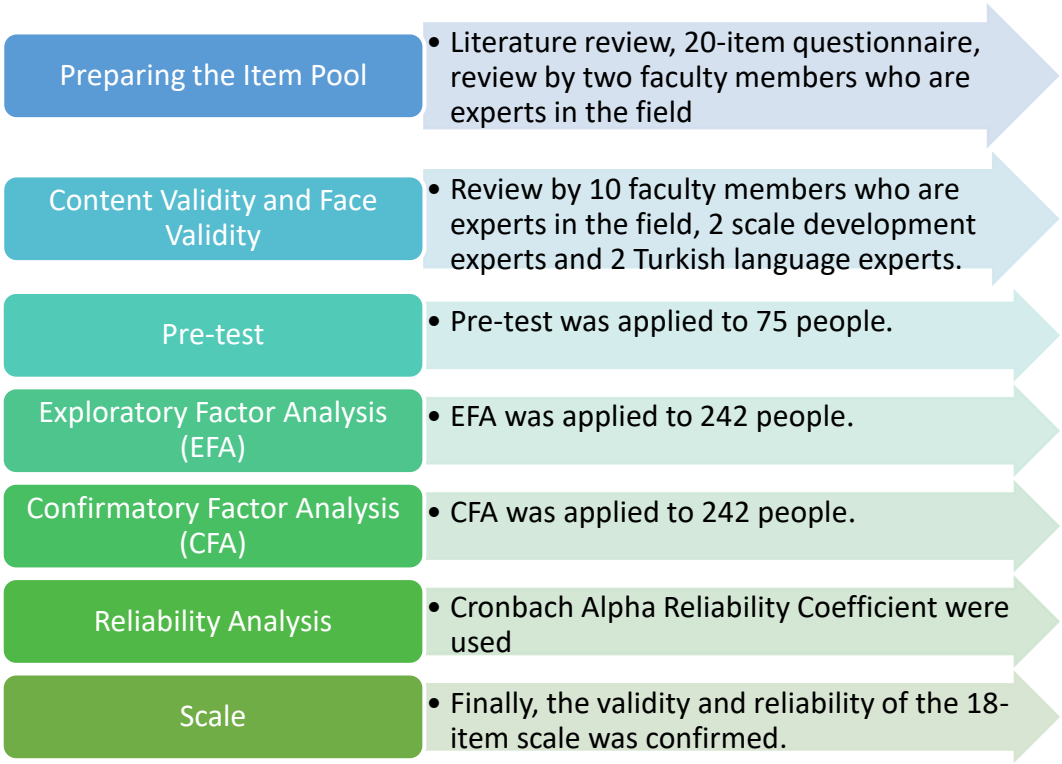

Figure 1. Scale development process

1.2. Ethical Considerations

The individuals participating in the research were determined on the basis of the principle of voluntariness. Necessary explanations were provided to these volunteering individuals and those who consented to participate in the research were asked to fill out the online scale after providing consent. The principles of "Confidentiality and Protection of Confidentiality" have been fulfilled by stating that the data collected for research purposes will be kept confidential; the ethical principles of "Respect for Autonomy" and in general "No Harm/Provide Benefit" have been fulfilled by recruiting those who want to participate voluntarily. Ethics Committee Approval for the research (Issue No: 255 dated 26.10.2021) was obtained from the Ethics Committee for the Scientific Research and Publications. Helsinki Declaration of Human Rights was adhered to throughout the study in line with the necessity of protecting individual rights.

2. Results

2.1. Data Analysis

At the initial stage of the scale development process, a pre-test was conducted to evaluate the scale's reliability coefficient. The Cronbach Alpha value obtained from this pre-test is displayed in Table 2.

Table 2 shows that the Cronbach Alpha value of at least 0.70 is deemed adequate[10].

Table 2. Pre-test cronbach alpha values

Cronbach Alpha	Mean	Variance	Standard Deviation	Number of Items
0.725	1.87	0.33	0.57	20

2.2. Exploratory Factor Analysis (EFA)

Upon completion of the survey processes designed for scale development, the gathered data were inputted into the SPSS software, preparing it for analytical processing. At this juncture, an Exploratory Factor Analysis (EFA) was conducted as a crucial step to ascertain the construct validity of the scale. This analytical approach involved examining the data to identify underlying factor structures, thereby ensuring that the scale accurately reflects the constructs it is intended to measure. The use of EFA in this phase plays a vital role in validating the scale's design and effectiveness, providing a robust foundation for the reliability and applicability of the scale in its intended context.

In order to assess the appropriateness of the scale for factor analysis, two key statistical measures were employed: the Kaiser-Meyer-Olkin (KMO) test and Bartlett's Test of Sphericity. The KMO value was calculated to evaluate if the sample size was adequate for a reliable factor analysis. This measure helps in determining the suitability of the data for such analysis by assessing the magnitude of partial correlation among variables. A higher KMO value indicates that factor analysis is likely to be meaningful. Additionally, Bartlett's Test of Sphericity was conducted to ascertain the intercorrelations among the scale items. By performing these two tests, the study aimed to ensure that the scale was statistically sound and suitable for factor analysis, thus laying a strong foundation for the subsequent steps in scale development and validation. KMO value is expected to be at least 0.50 and a value above 0.90 is considered to be excellent[11]. The values presented in Table 3. confirm that the scale is suitable for factor analysis.

Table 3. Kaiser-Meyer-Olkin Test and Bartlett's Test of sphericity

Kaiser-Meyer-Olkin Test for Measuring Sample Adequacy.		0.854
Bartlett's Test of Sphericity	Chi-square	1996.527
	SD	153
	p	0.000

[10] Rex Kline, "Convergence of structural equation modeling and multilevel modeling", *The SAGE handbook of innovation in social research methods*, (2011) 562-589.

[11] Ezel Tavşancıl, *Tutumların Ölçülmesi Ve SPSS ile Veri Analizi* (İstanbul: Nobel Yayıncılık, 2010).

For the purpose of the factor analysis on the data set, the values suggested by Çokluk, Şekercioğlu and Büyüköztürk (2010) and presented below were used[12]. In the process of evaluating the scale, several critical criteria were established to ensure the clarity and distinctiveness of the factors. First, it was stipulated that there should be a minimum difference of 0.1 in the loading value between the factors on which an item loaded. This criterion ensures that each item on the scale distinctly associates with one factor over others, enhancing the interpretability of the factor structure.

Additionally, the eigenvalues of the factors were required to be at least "1". Eigenvalues are a measure of the variance in all the items which a particular factor explains. An eigenvalue of 1 or more suggests that the factor is significant and contributes meaningfully to explaining the variance in the data. Furthermore, the factor communality ratio for each item was mandated to be no less than 0.32. A threshold of 0.32 ensures that each item shares a sufficient amount of variance with the factors, confirming its relevance in the scale. Upon applying these criteria, it was ascertained that there were no overlapping items within the scale. This means that each item was uniquely and adequately represented by the factors, with no significant redundancy or ambiguity in how the items related to the different factors. This rigorous approach to item analysis and factor selection underscores the robustness and precision of the scale development process.

In exploratory factor analysis, one of the most commonly utilized techniques is the maximum likelihood method. This sophisticated statistical approach, employed in the analysis phase of this study, estimates the probability of the observed data under different factor solutions, thereby determining the most likely factor structure for the dataset. Given that the items in this study were found to be correlated, oblique (oblimin) rotation was applied. Unlike orthogonal rotation methods where factors are assumed to be uncorrelated, oblique rotation allows for intercorrelations among factors. This is particularly useful in complex psychological and social sciences datasets where variables often share some degree of relationship[13]. Furthermore, according to Pallant's 2020 guidelines, items exhibiting a value lower than 0.30 in the communalities table were considered incompatible under a common factor. A value below 0.30 suggests that the item does not share enough common variance with other items to justify its inclusion in a factor. This threshold is critical to ensure that each item meaningfully contributes to a common underlying construct, thereby enhancing the interpretability and validity of the factor analysis results. This careful consideration of methodological choices and adherence to established statistical guidelines underscores the rigor of the analysis in this study[14]. Information on the common loads along with the variance explained by the factors are exhibited in Table 4.

As a result of the analysis, items 1 and 2 were removed from the questionnaire as their communality was below 0.3. Table 4. indicates that there is no item with a communality below 0.3. The table draws attention to the formation of a four-dimensional scale with an eigenvalue greater

12 Ömay Çokluk vd., *Multivariate statistics for social sciences: SPSS and LISREL applications* (Ankara: Pegem Akademi, 2010).

13 Çokluk vd., *Multivariate statistics for social sciences: SPSS and LISREL applications.*

14 Julıe Pallant, *SPSS kullanma kılavuzu: SPSS ile adım adım veri analizi*, çev. Sibel Balcı - Berat Ahi (İstanbul: Anı Yayıncılık, 2017).

than 1 and explaining 53.687% of the variance. Henson and Roberts (2006) state that the explained variance rate should be 52% and above[15]. In this respect, the variance rate explained by this study is considered to be sufficient.

Table 4. Communalities of the items, item loads and explained variance ratio

		Communalities	Factor Load Values
Chance	m15	0.680	0.878
	m16	0.692	0.864
	m14	0.564	0.570
Self-control	m7	0.427	0.721
	m8	0.404	0.697
	m9	0.377	0.659
	m6	0.344	0.486
Belief	m17	0.620	0.808
	m18	0.630	0.807
	m19	0.643	0.740
	m20	0.556	0.732
	m12	0.445	0.588
Predetermination	m13	0.507	0.684
	m11	0.553	0.662
	m4	0.373	0.614
	m5	0.377	0.604
	m3	0.302	0.540
	m10	0.526	0.503
	Total Explained Variance		53.687%

Figure 2 demonstrates the Scree Plot, which is another indicator showing how many dimensions the scale consist of.

[15] Robin Henson - Kyle Roberts, "Use Of Exploratory Factor Analysis In Published Research: Common Errors And Some Comment On Improved Practice", *Educational And Psychological Measurement*, 66/3 (2006) 393-416.

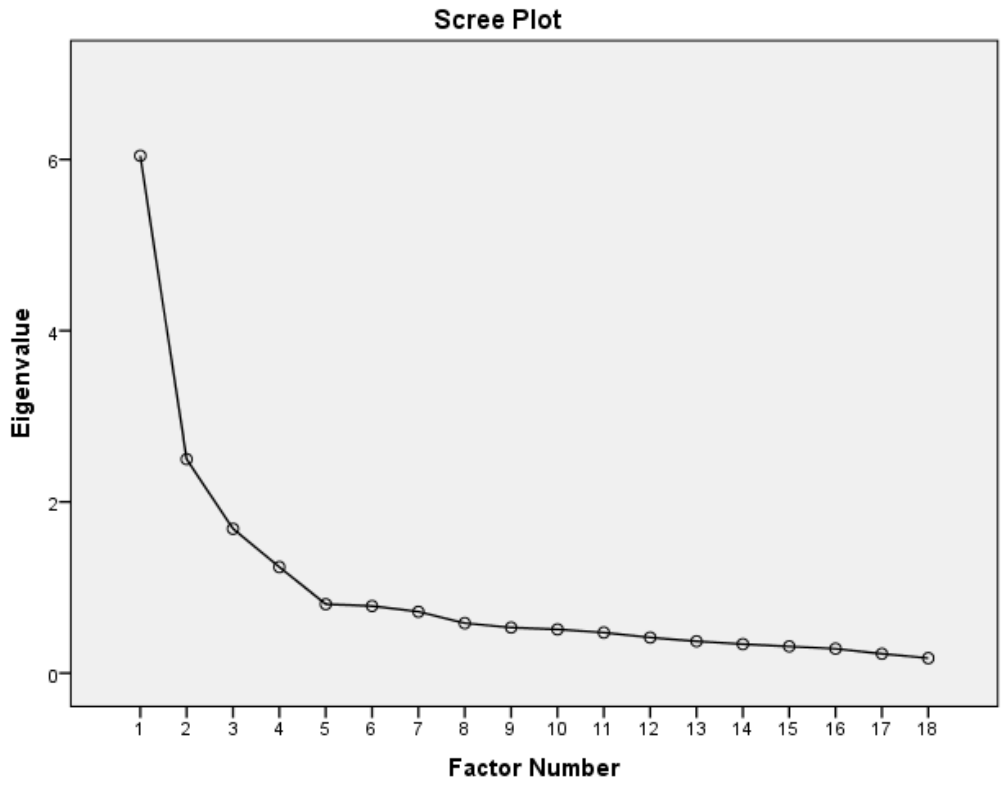

Figure 2. Scree plot

Factor names and the items included in the factors are exhibited in Table 5.

Table 5. Factor names and the items included in the factors of the fatalism scale with regard to occupational accidents and occupational diseases

Factor	Factor Name	Related Items	Min. and Max. Score
Factor #1	Chance	m15, m16, m14	3-15
Factor #2	Self-control	m7, m8, m9, m6	4-20
Factor #3	Belief	m17, m18, m19, m20, m12	5-25
Factor #4	Predetermination	m13, m11, m4, m5, m3, m10	6-30

2.3. Confirmatory Factor Analysis (CFA)

After conducting the Exploratory Factor Analysis (EFA), the study progressed to a subsequent phase involving Confirmatory Factor Analysis (CFA). The purpose of this CFA was to rigorously test and verify the factor structure that had been initially identified in the EFA. This step is crucial in scale development as it serves to validate the theoretical framework and dimensional structure proposed by the EFA. In CFA, the hypothesized factor structure, which includes the number of

factors and the loading of specific items on these factors, is statistically tested against the actual data. This analysis provides a robust method to assess whether the data fits the proposed model. By doing so, CFA helps to confirm the appropriateness and accuracy of the factor structure that emerged from the exploratory phase. The CFA process involves the use of various fit indices and statistical tests to evaluate the model fit. These indices help in determining how well the proposed factor structure aligns with the observed data. A good model fit in CFA strengthens the validity of the scale, indicating that the factors identified are reliable and represent the underlying constructs effectively. Therefore, the execution of CFA following EFA is a critical step in establishing the validity and reliability of the scale, ensuring that the scale structure is not only theoretically sound but also empirically supported. The path diagram with regard to the CFA is demonstrated in Figure 3.

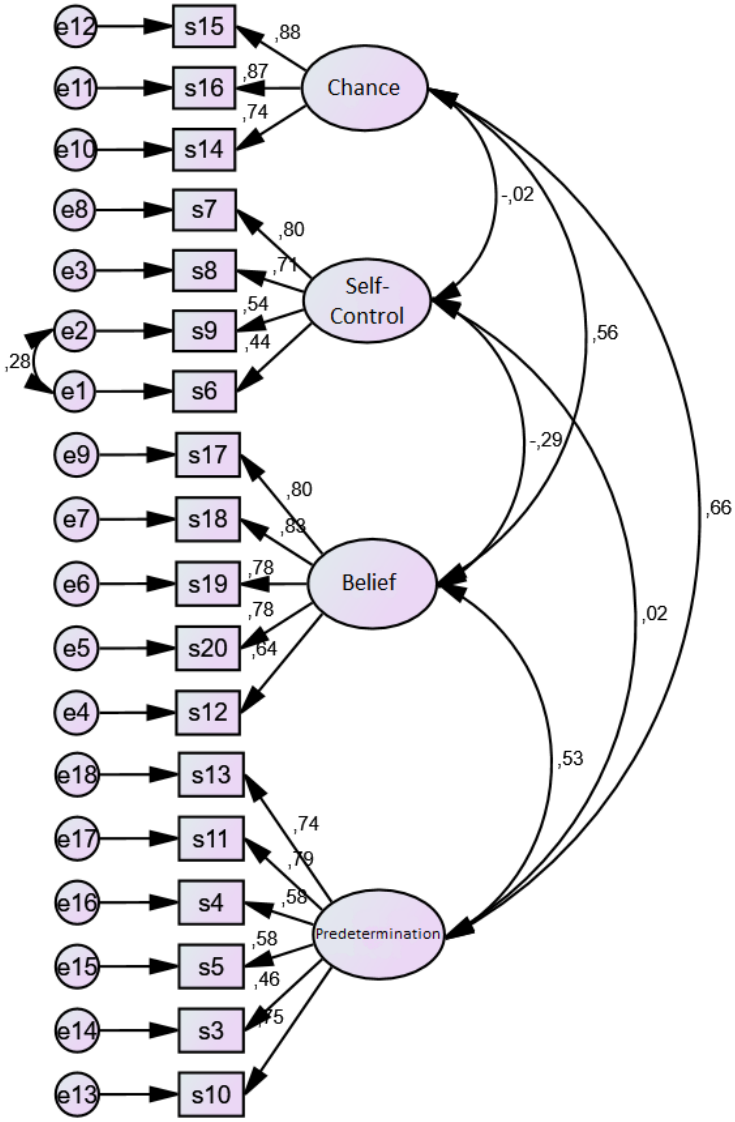

Figure 3. Path diagram with regard to the confirmatory factor analysis

After the path diagram with regard to the CFA, demonstrated in Figure 3. It was stated that this value should be at least 0.3 and above[16]. A covariance was drawn between item 9 (m9) and item 6 (m6) of the scale, which were classified under the self-control dimension.

Various goodness-of-fit tests are used to examine the model fit of the scale[17]. In this context, fit indices of this scale, demonstrated in Figure 3. The fit indices of the scale were concluded to be between acceptable thresholds and that they exhibited good-fit. The fit indices of CFA and the criteria ranges specified in the literature[18] are provided in Table 6.

Table 6. Fit indices of the confirmatory factor analysis

Indices	Reference Value		Measured Value	Result
	Acceptable Fit	Good Fit		
CMIN/DF	3< χ2/sd ≤ 5	0< χ2/sd ≤ 3	2.044	Good Fit
RMSEA	0.05 ≤ RMSEA ≤ 0.08	0 ≤ RMSEA ≤ 0.05	0.066	Acceptable Fit
AGFI	0.85 < AGFI≤ 0.89	0.90< AGFI≤ 1	0.858	Acceptable Fit
IFI	0.90 < IFI≤ 0.94	0.95< IFI≤ 1	0.931	Acceptable Fit
TLI	0.90 < TLI≤ 0.94	0.95< TLI≤ 1	0.916	Acceptable Fit
GFI	0.85 < GFI≤ 0.89	0.90< GFI≤ 1	0.894	Acceptable Fit
CFI	0.90 < CFI≤ 0.94	0.95< CFI≤ 1	0.930	Acceptable Fit

2.4. Reliability Analysis

Reliability analysis results for the sub-dimensions of the scale are exhibited in Table 7. In our study, when the Cronbach's alpha values between the lower 27 percent and the upper 27 percent were analyzed, the Cronbach's alpha value for the lower 20 percent was 0.75 and for the upper 20 percent it was 0.88. These findings show reliable results on how scale reliability varies among different participant groups.

16 İsmail Seçer, *Psikolojik Test Geliştirme Ve Uyarlama Süreci: SPSS ve LISREL Uygulamaları* (İstanbul: Anı yayıncılık, 2018).

17 James Mcmillan - Sally Schumacher, "Evidence-based inquiry", *Research in education*, 6/1 (2006) 26-42; Barbara Hazard Munro, *Statistical Methods For Health Care Research* (lippincott williams & wilkins, 2005); Ömer Faruk Şimşek, *Yapısal Eşitlik Modellemesine Giriş: Temel Ilkeler Ve LISREL Uygulamaları* (İstanbul: Ekinoks Yayınevi, 2020).

18 Karin Schermelleh-Engel - Helfried Moosbrugger, "Evaluating The Fit Of Structural Equation Models: Tests of Significance And Descriptive Goodness-Of-Fit Measures", *Methods of psychological research online*, 8/2 (2003) 23-74; Daire Hooper vd., "Evaluating Model Fit: A Synthesis Of The Structural Equation Modelling Literature". *In: 7th European Conference On Research Methodology For Business And Management Studies* (2008) 195-200.

Table 7. Reliability analysis of the sub-dimensions of the scale

Dimension (Factor)	Number of Items	Cronbach Alpha
Chance	3	0.866
Self-control	4	0.739
Belief	5	0.874
Predetermination	6	0.801

3. Discussion

This study aimed to develop a reliable and valid measurement tool to determine the fatalistic tendencies of the individuals working in any job towards occupational accidents and occupational diseases.

Mainly, two criteria are needed to develop a new scale. These are validity and reliability[19]. A pilot scheme is required to determine whether the 20-item draft scale is comprehensible for the research sample. A sample size of 30-50 participants is considered to be sufficient for the pilot scheme in question[20]. The reliability coefficient, sufficient for a Likert-type scale, is suggested be above 0.70; however, it is expected to be close to 1 as much as possible[21]. The Cronbach Alpha value of the pre-test application of this study was determined as 0.72. Thus, the content validity was completed and the draft scale took its final form.

The next step after determining the content validity of the scale was to determine the construct validity[22]. KMO and Bartlett tests should be performed primarily for factor analysis[23]. KMO value is expected to be greater than 0.5 for factor analysis purposes[24]. The measure of the sampling adequacy of the KMO is stated as follows. A KMO value between 0.90 to 1.00 indicates excellence in sampling[25]. The KMO value and the Bartlett's sphericity test was confirmed.

Factor loadings are employed to ascertain the degree of correlation between individual items and their corresponding factors. It is generally recommended that these loadings exceed 0.30 to ensure a significant association[26]. In this study, two items that demonstrated factor loadings

19 Şener Büyüköztürk, *Sosyal Bilimler Için Veri Analizi El Kitabı* (Ankara: Pegem Akademi Yayıncılık, 25. Basım, 2019).

20 Hasan Şeker - Başaran Gençdoğan, *Psikolojide Ve Eğitimde Ölçme Aracı Geliştirme* (İstanbul: Nobel Akademik Yayıncılık, 2006).

21 Ata Tezbaşaran, *Likert Tipi Ölçek Hazırlama Kılavuzu* (Ankara: Türk Psikologlar Derneği Yayınları, 2008).

22 Cantürk Çapık vd., "Intercultural Scale Adaptation Stages, Language And Culture Adaptation: Updated Guideline". *Journal Of Nursing-Florence Nightingale,* 26/3 (October 2018). 199-210.

23 Büyüköztürk, *Sosyal Bilimler Için Veri Analizi El Kitabı*; Reha Alpar, *Applied Statistics And Validity-Reliability* (Ankara: Detay Publishing, 2012).

24 Ree Chan Ho vd., *Impact Of Globalization And Advanced Technologies On Online Business Models* (IGI Global, 2021).

25 Şener Büyüköztürk, *Data Analysis Handbook For Social Sciences Statistics, Research Pattern Spss Applications And Interpretation* (Ankara: Pegem Academy, 2017).

26 Brett Williams vd., "Exploratory Factor Analysis: A Five-Step Guide For Novices". *Australasian journal of paramedicine*, 8 (2010) 1-13.

below 0.30 were removed from the preliminary scale. The remaining items exhibited factor loadings that varied from 0.48 to 0.87.

For the purpose of determining the number of factors in this study, table of communalities, eigenvalue and Scree Plots were used along with the oblique rotation as it is a structure that requires the factors to be associated with each other. For the purpose of interpreting a scree plot in factor analysis, the point where the ordinary structure in the graph suddenly breaks down is taken as a basis to determine the value of the factor numbers[27]. Eigenvalues in factor analysis are critical for two main purposes: they measure the amount of variance each factor accounts for in the dataset, and they help identify the significant factors to retain in the analysis. Generally, factors with eigenvalues greater than 1 are considered important, as they explain a substantial portion of the variance in the data, and are thus typically retained for further analysis[28]. In this respect, a factor with an eigenvalue higher than 1 is considered significant. The increase in the variance of the scale indicates that the factor structure of that scale is strong. Accordingly, the variance in scales with a large number of factors is expected to explain 40% or 60% of the total factors[29]. In our work confirmed.

Accordingly, the structure of the Fatalism Scale with Regard to Occupational Accidents and Occupational Diseases was examined with χ2/df, RMSEA, AGFI, IFI, TLI, GFI and CFI goodness-of-fit tests within the scope of CFA. It is stated in the literature that a χ2/df value equal to or below five indicates that the tested model has a high level of good fit[30]. The χ2/df value here in was calculated as 2.044 which indicates that the Scale has a good-fit. Other fit index values also the acceptable range. Furthermore, RMSEA value of the Scale was calculated as 0.066 which indicates an acceptable goodness-of-fit level. Fit indices in statistical analysis, particularly in models like Confirmatory Factor Analysis (CFA), are a set of values that are interconnected and evaluated collectively to determine how well a proposed model fits the observed data. These indices are derived from various aspects of the model and are closely related to each other in assessing the model's overall quality. Each fit index focuses on a different dimension of model fit, such as the discrepancy between the observed and predicted data, the complexity of the model, or its predictive power. When these indices are evaluated together, they provide a comprehensive picture of the model's performance. This holistic approach is essential because relying on a single index might not capture all the nuances of the model's fit. By considering multiple fit indices, researchers can make a more informed judgment about the suitability of their model, leading to more robust and reliable findings[31]. For this purpose, the four-factor structure of the scale was further evaluated and validated for relevance after the EFA.

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27 Andy Field, *Discovering statistics using SPSS* (London (UK): Sage Publications Ltd. 2009).

28 Hakan Baydur - Erhan Eser, "Uygulama: Yaşam Kalitesi Ölçeklerinin Psikometrik Çözümlenmesi, *Sağlıkta Birikim*, 1/2 (2006) 99-123.; Andrea Marshall vd., "Assessing Psychometric Properties Of Scales: A Case Study", *Journal of Advanced Nursing*, 59/4 (2007) 398-406.

29 Şener Büyüköztürk, *A Booklet On Data Analysis For Social Sciences* (Ankara: Pegem Publishing, 2010).

30 Mousa Alavi vd., "Chi-Square For Model Fit In Confirmatory Factor Analysis", *Journal Of Advanced Nursing*, 76/9 (2020) 2209-2211..

31 Todd Lewis, "Evidence regarding the internal structure: Confirmatory factor analysis", *Measurement and Evaluation in Counseling and Development*, 50/4 (2017) 239-247.

Thereafter, the reliability analyzes of the Fatalism Scale with Regard to Occupational Accidents and Occupational Diseases were performed. The cut-off value of item-total correlations of 0.30 and above[32] indicates that the participants understood the statements correctly. In addition, item discrimination values of scale was high[33]. Item discrimination values herein varies between 0.878 and 0.455. These results indicated that item discrimination values of the Fatalism Scale With Regard To Occupational Accidents and Occupational Diseases were high, its items were clear and objective.

The most prevalent method for assessing internal consistency in Likert-type scales is the use of the Cronbach Alpha coefficient. This statistical tool is integral for evaluating the extent of correlation and interrelatedness among the items within the scale. Cronbach's Alpha essentially measures how well a set of items consistently represents a single latent construct or variable. When applying Likert-type scales, which often involve responses to various statements on a scale (such as strongly agree to strongly disagree), Cronbach's Alpha helps in determining whether the responses across these items are consistently aligned. A higher Cronbach's Alpha value indicates a stronger correlation among the items, suggesting that they are likely measuring the same underlying concept or construct. This makes it an essential measure in scale development and validation, ensuring that the scale reliably assesses the intended psychological or behavioral attribute[34]. Scales with a Cronbach's alpha value between 0.80–1.00 are considered to have high reliability[35]. Accordingly, our scale as per the Cronbach Alpha value was determined to be 0.81. Cronbach's alpha values for the four sub-dimensions of the scale were determined respectively as 0.86 for chance, 0.73 for self-control, 0.87 for belief and 0.80 for predetermination.

Conclusion

At the end of the validity and reliability analyzes performed with the purpose of scale development within the scope of this study, it has been revealed that the scale is a valid and reliable scale. The 18-item scale is 5-point Likert-type scale and consists of 4 sub-dimensions. This scale will contribute to the determination of fatalistic perceptions, particularly with regard to occupational accidents that develop instantly in the workplace or occupational diseases that occur during and due to the execution of the work. In particular, it will contribute to providing the necessary training on this subject for the nurses or workplace nurses providing health care services and to minimize the potential risks that may arise. Thus, necessary measures will be taken against occupational accidents and diseases. It is considered to positively affect the participation of employees in health screenings. This scale can further be adapted addressing individuals living in different cultures.

32 Tavşancıl, *Tutumların Ölçülmesi Ve SPSS ile Veri Analizi*.

33 Tavşancıl, *Tutumların Ölçülmesi Ve SPSS ile Veri Analizi*; Büyüköztürk, Sosyal Bilimler Için Veri Analizi El Kitabı.

34 Çapık, Intercultural Scale Adaptation Stages, Language And Culture Adaptation: Updated Guideline, 199-210.

35 Reha Alpar, *Applied Statistics And Validity-Reliability With Examples From Sports, Health And Educational Sciences* (Ankara: Detay Publishing, 2010).

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APPENDIX

İŞ KAZALARI VE MESLEK HASTALIKLARINA YÖNELİK KADERCİLİĞİ ÖLÇEĞİ	Kesinlikle katılmıyorum	Katılmıyorum	Kararsızım	Katılıyorum	Kesinlikle katılıyorum
1. ve 2. maddeler ölçek geçerliliği sürecinde ölçekten çıkarılmıştır.					
3. İş kazaları beklenmedik bir anda olur ve önlemek için yapabilecek hiçbir şey yoktur.					
4. İş kazaları veya meslek hastalıkları kaderimdir deyip başıma gelmesine izin veririm.					
5. Her iş olacağına varır deyip iş kazaları ve meslek hastalıklarını pek umursamam.					
6. İş kazası geçirmek veya meslek hastalığına yakalanmak kendi davranışlarımdan kaynaklandığını düşünürüm.					
7. İş kazası geçirme veya meslek hastalığına yakalanma ihtimalim gösterdiğim çabaya göre şekillenecektir.					
8. Dikkat düzeyime göre iş kazası geçirme veya meslek hastalığına yakalanma ihtimalimi düşüreceğime inanırım.					
9. İş kazası geçirme veya meslek hastalığına yakalanma benim elimdedir.					
10. Nazar boncuğu, tütsü gibi nesneler takmak beni iş kazası geçirme veya meslek hastalığına yakalanmaktan korur.					
11. Cin tarzında bazı kelimeleri söylersem çarpılıp iş kazası geçirme veya meslek hastalığına yakalanma ihtimalim artar.					
12. Çalışacağım yere sağ ayakla girmek, sağ elle yemek yememin iş kazası geçirme veya meslek hastalığına yakalanma karşı koruyucu olacağına inanırım.					
13. Çalışırken kara kedi görmem, merdiven altından geçmem gibi davranışlarımın uğursuzlukları kaynaklı					

iş kazası geçirme veya meslek hastalığına yakalanma ihtimalimi arttırabilirim.					
14. Kötü şans nedeniyle iş kazası geçirmem veya meslek hastalığına yakalanmam artabilir.					
15. Bazı insanlar doğuştan şanslı olduğu için önlem almazsa bile iş kazası geçirme veya meslek hastalığına yakalanma ihtimali düşüktür.					
16. İyi bir şansa sahipsen iş kazası geçirmen veya meslek hastalığına yakalanman çok düşüktür.					
17. İbadetlerimi yerine getirirsem iş kazası geçirme veya meslek hastalığına yakalanma ihtimalimi azaltırım.					
18. İnancıma göre hareket etmediğimde iş kazası geçirme veya meslek hastalığına yakalanma ihtimalim artar.					
19. Dini bilgilerimi artırırsam iş kazası geçirme veya meslek hastalığına yakalanma ihtimalim azalır.					
20. Dinin yasak ettiği şeyleri yaparsam iş kazası geçirme veya meslek hastalığına yakalanma ihtimalim artar.					