ORIGINAL RESEARCH ORİJİNAL ARAŞTIRMA

DOI: 10.5336/healthsci.2025-113285

Development and Psychometric Evaluation of Fear of Exposure to Violence Scale for Healthcare Professionals: Methodological Study

Sağlık Profesyonelleri İçin Şiddete Maruz Kalma Korkusu Ölçeği'nin Geliştirilmesi ve Psikometrik Değerlendirmesi: Metodolojik Çalışma

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This study was presented as an oral presentation at 8th International and 12th National Congress of Psychiatric Nursing, April 16-19, 2025, Diyarbakır, Türkiye.

ABSTRACT Objective: Healthcare professionals are frequently exposed to violence in clinical settings, which can negatively affect both their personal safety and job performance. Accurately assessing the fear of exposure to violence in clinical environments is essential for developing effective prevention strategies and ensuring safe working conditions. The aim of this study is to develop a valid and reliable measurement tool to evaluate the fear of exposure to violence among healthcare professionals. **Material and Methods:** This methodological study, which included 421 volunteer healthcare professionals via online platforms, involved a 3-phase scale development process: a pilot application, exploratory factor analysis, and confirmatory factor analysis. **Results:** Initially, a pool of 64 items was created based on a literature review. After expert evaluation for content validity, a 20-item version was formed. Exploratory factor analysis revealed a 1-factor structure with 13 items. Following confirmatory factor analysis, 2 items were removed, and the final model consisting of 11 items was confirmed. Goodness-of-fit indices indicated a good fit between the model and the data. A moderate positive correlation was found between the developed scale and a similar scale in the literature. The Cronbach's alpha coefficient was calculated as 0.93, indicating high internal consistency and reliability. **Conclusion:** The "Fear of Exposure to Violence Scale" is a valid and reliable 11-item, single-factor tool for assessing healthcare professionals' fear of exposure to violence. It is expected to enhance awareness and support safer healthcare environments.

Keywords: Violence; health personnel; fear; psychometrics; workplace violence

ÖZET Amaç: Sağlık profesyonelleri, klinik ortamlarda sıklıkla şiddete maruz kalmakta ve bu durum, hem kişisel güvenliklerini hem de iş performanslarını olumsuz etkileyebilmektedir. Klinik ortamlarda şiddete maruz kalma korkusunun doğru bir şekilde değerlendirilmesi, etkili önleme stratejilerinin geliştirilmesi ve güvenli çalışma koşullarının sağlanması açısından büyük önem taşımaktadır. Bu çalışmanın amacı, sağlık profesyonellerinin şiddete maruz kalma korkularını değerlendirmeye yönelik geçerli ve güvenilir bir ölçüm aracı geliştirmektir. **Gereç ve Yöntemler:** Bu metodolojik çalışma, çevrim içi platformlar aracılığıyla gönüllü olarak katılan 421 sağlık profesyonelini kapsamaktadır. Ölçek geliştirme süreci, pilot uygulama, açımlayıcı faktör analizi ve doğrulayıcı faktör analizi olarak 3 aşamadan oluşmuştur. **Bulgular:** Literatür taramasına dayalı olarak başlangıçta, 64 maddeden oluşan bir madde havuzu oluşturulmuştur. İçerik geçerliği için uzman değerlendirmesi sonrasında 20 maddelik bir versiyon hazırlanmıştır. Açımlayıcı faktör analizi sonucunda 13 maddelik tek faktörlü bir yapı elde edilmiştir. Doğrulayıcı faktör analizinin ardından 2 madde çıkarılmış ve 11 maddeden oluşan nihai model doğrulanmıştır. Uyum iyiliği indeksleri, model ile veriler arasında iyi düzeyde uyum olduğunu göstermiştir. Geliştirilen ölçek ile literatürdeki benzer bir ölçek arasında orta düzeyde pozitif korelasyon bulunmuştur. Cronbach alfa katsayısı 0,93 olarak hesaplanmış olup, yüksek iç tutarlılık ve güvenirlik düzeyine işaret etmektedir. **Sonuç:** "Şiddete Maruz Kalma Korkusu Ölçeği", sağlık profesyonellerinin şiddete maruz kalma korkusunu değerlendirmeye yönelik geçerli ve güvenilir, 11 maddelik tek faktörlü bir ölçüm aracıdır. Bu ölçeğin, farkındalığın artırılmasına ve daha güvenli sağlık ortamlarının desteklenmesine katkı sağlaması beklenmektedir.

Anahtar Kelimeler: Şiddet; sağlık personeli; korku; psikometri; iş yeri şiddeti

TO CITE THIS ARTICLE:
Mansuroğlu S, Tek Sevindik S, Erk MA, Fırat S. Development and psychometric evaluation of Fear of Exposure to Violence Scale for healthcare professionals: Methodological study. Turkiye Klinikleri J Health Sci. 2026;11(1):288-95.

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Peer review under responsibility of Turkiye Klinikleri Journal of Health Sciences.

Received: 07 Jul 2025 ***Received in revised form:*** 05 Nov 2025 ***Accepted:*** 25 Nov 2025 ***Available online:*** 20 Jan 2026

Violence is defined as "the intentional use of physical force or power, threatened or actual, against oneself, another person, or against a group or community" and is recognized as a significant public health and occupational problem.[1] Healthcare workers are among the most affected groups because their working conditions frequently expose them to verbal, physical, and psychological violence.[2-5] Exposure to violence in healthcare settings not only threatens physical safety but also causes emotional distress, decreased job satisfaction, burnout, and turnover intentions.[6-9]

In addition to direct experiences of violence, the fear of potential exposure constitutes an important psychological burden.[10-12] Even without an incident, anticipation of violence may trigger anxiety, hypervigilance, and avoidance behaviors, all of which can impair both professional performance and the quality of care provided.[13-17] This aligns with Protection Motivation Theory, which suggests that perceived threats can lead to defensive reactions and adverse organizational outcomes.[18]

Although many studies have examined the frequency and types of violence in healthcare, fewer have focused on the fear of violence as a distinct concept.[19-25] Existing scales, such as the Fear of Violence Scale, have contributed valuable insights, yet they remain limited because they mainly emphasize time-based expectations of violence and do not fully address subjective perceptions of threat or emotional responses.[10,19] As a result, there is a gap in the literature regarding comprehensive tools that capture both prior exposure and the perceived threat of potential violence among healthcare professionals. The Fear of Exposure to Violence Scale for Healthcare Professionals developed in this study differs from the previously used Fear of Violence Scale in several important respects and offers significant advantages. Unlike the earlier scale, which focused primarily on types of incidents and the frequency of past exposure, the new scale incorporates elements specific to the healthcare context (e.g., interactions with patients and their relatives, unit security), thereby enhancing its content validity. In addition, by addressing the subjective components of fear (such as anxiety, helplessness, and tension) and indirect sources of threat (such as news reports of violence and witnessing incidents), the scale captures the emotional and cognitive dimensions of the concept, filling a notable gap in the literature. Furthermore, its direct assessment of the impact of fear on motivation and functionality reveals not only the perceived likelihood of violence but also its implications for professional performance and quality of care. In these respects, the scale conceptualizes fear of violence in a more comprehensive, context-specific, and theoretically robust framework.

Therefore, fear of violence has clearly dual negative consequences for both the service provider and the recipient. In line with this, the aim of the present study is to develop a valid and reliable instrument to assess the fear of exposure to violence among healthcare professionals and to comprehensively examine its psychometric properties.

MATERIAL AND METHODS

PURPOSE AND DESIGN OF THE STUDY

This study is a methodological research project conducted to develop a new measurement tool to assess healthcare professionals' fear of exposure to violence. The research was carried out in 3 stages: a pilot study, exploratory factor analysis, and confirmatory factor analysis.

Research Questions

- Is the newly developed Fear of Exposure to Violence Scale a valid tool for measuring the fear of exposure to violence among healthcare professionals?
- Is the newly developed Fear of Exposure to Violence Scale a reliable tool for measuring the fear of exposure to violence among healthcare professionals?

POPULATION AND SAMPLE

The study population consisted of actively employed healthcare professionals in Türkiye. The sample was determined through a convenience sampling method, and data were collected via online platforms between October and December 2024. After eliminating incomplete and extreme data, responses from a total of

421 participants who met the inclusion criteria were included in the analysis.

Inclusion Criteria

- Actively working as a healthcare professional,
- Voluntary participation,
- Being 18 years of age or older.

The majority of the participants (71.3%) were nurses/midwives, with a mean age of 30.23±9.93 years (minimum-maximum=20-71). Of the participants, 76.7% were female, 63% were single, and 83.8% worked in public healthcare institutions. The average length of professional experience was 7.98±9.13 years (minimum-maximum=1-41). A total of 60.6% of the participants stated they had witnessed violence in the workplace, and 58.4% had experienced violence themselves. Among those exposed, 35% reported verbal violence (Table 1).

TABLE 1: Sociodemographic characteristics of the participants

Variables	n (%)
Gender	
Female	323 (76.7)
Male	98 (23.3)
Marital status	
Married	156 (62.9)
Single	265 (37.1)
Profession	
Nurse/midwife	300 (71.3)
Physician/dentist	62 (14.7)
Health technician/technologist	35 (8.3)
Other	24 (5.7)
(e.g., social worker, psychologist, dietitian, physiotherapist, pharmacist)	
Institution type	
Public	353 (83.8)
Private	68 (16.2)
Witnessed violence	
Yes	255 (60.6)
No	166 (39.4)
Experienced violence	
Yes	246 (58.4)
No	175 (41.6)
Type of violence experienced (n=246)	
Verbal	86 (35.0)
Emotional/psychological	75 (30.5)
Physical	55 (22.4)
Economic	11 (4.5)
Cyber	11 (4.5)
Sexual	8 (3.3)

Scale Development Process

Pilot Study (Group 1): A total of 30 healthcare professionals participated in the pilot study. Participants who completed the questionnaire were not included in the subsequent analyses. No items were removed at this stage, and the process proceeded to the next phase.

Exploratory Factor Analysis Sample (Group 2): The scale form was administered to 204 healthcare workers for exploratory factor analysis.

Confirmatory factor analysis Sample (Group 3): The scale was administered to a separate group of 217 participants for confirmatory factor analysis.

DATA COLLECTION TOOLS

Personal Information Form: Prepared in line with the literature to determine participants' demographic characteristics, this form consisted of 9 questions.[10,13,26]

Draft Form of the Fear of Exposure to Violence Scale: Developed by the researchers, this 5-point Likert-type scale (1: Strongly disagree-5: Strongly agree) initially included 20 items.

Fear of Violence Scale: Originally developed by Rogers and adapted into Turkish by Akbolat et al., this scale was used for assessing concurrent validity.[10,19] It consists of 10 items and a single factor measuring healthcare professionals' fear of being subjected to physical or non-physical violence by patients or their relatives within the next year. Responses range from "1: Strongly disagree" to "5: Strongly agree". The internal consistency coefficient of the scale was found to be 0.98, indicating high reliability.

ETHICAL CONSIDERATIONS

Ethical approval for the study was obtained from the Ethics Committee of Çukurova University Faculty of Medicine (date: June 14, 2024; no: 145). Informed consent was obtained from participants, and all phases of the research were conducted in accordance with ethical and confidentiality principles based on the Declaration of Helsinki.

DATA ANALYSIS

The statistical analyses were performed using SPSS version 25.0 (IBM Corporation, Armonk, NY, USA) and AMOS version 24.0 (IBM Corporation, Armonk, NY, USA). The adequacy of the data for factor analysis was evaluated using the Kaiser-Meyer-Olkin measure and Bartlett's test of sphericity. Exploratory factor analysis was conducted to investigate the underlying item structure, with the number of factors determined through eigenvalue criteria and inspection of the scree plot. Principal component analysis served as the extraction technique, and varimax rotation was applied to enhance interpretability. Confirmatory factor analysis was utilized to assess construct validity. Concurrent validity was examined via correlation analyses. The internal consistency reliability of the scale was determined using Cronbach's alpha coefficient. A p value of less than 0.05 was considered statistically significant throughout the analyses.

RESULTS

PHASE 1: ITEM POOL AND EXPERT REVIEW

Initially, a conceptual structure was developed based on a literature review, and a draft pool of 64 items was created. Items with similar or overlapping meanings were eliminated by the researchers, and a 20-item draft version was finalized after obtaining feedback from 10 experts, including academic staff in psychiatric nursing and medicine, as well as experienced healthcare professionals with at least a master's degree. In scale adaptation studies, it is recommended to conduct a pilot test with 30-40 individuals to assess clarity.[27] Minor revisions (wording and spelling) were made based on expert suggestions, and the draft scale was administered to 30 active healthcare professionals. Since no negative feedback or suggestions were received, it was decided to proceed with validity and reliability testing using a larger sample.

PHASE 2: EXPLORATORY FACTOR ANALYSIS RESULTS

To evaluate the suitability of the data for factor analysis, the Kaiser-Meyer-Olkin measure and Bartlett's test of sphericity were used. The Kaiser-Meyer-Olkin value was 0.943, and Bartlett's test was statistically significant ($p<0.001$) (Table 2).

TABLE 2: Kaiser-Meyer-Olkin and Bartlett's test results

Statistic	Value
Kaiser-Meyer-Olkin measure of sampling adequacy	0.943
Bartlett's test of sphericity	Approx. χ^2=1,718.827; df=78; p<0.001

Principal components analysis with varimax rotation was used during the exploratory factor analysis. Seven items with factor loadings below 0.45 were excluded, resulting in a unidimensional structure with 13 items. This structure explained 56.538% of the total variance. The factor loadings of the remaining items ranged between 0.526-0.888 (Table 3). The

TABLE 3: Scale items and factor loadings

Items	Factor loading
Item 1	0.526
Item 3	0.624
Item 6	0.654
Item 7	0.781
Item 8	0.705
Item 9	0.861
Item 10	0.888
Item 11	0.692
Item 12	0.611
Item 14	0.883
Item 15	0.720
Item 17	0.698
Item 18	0.744

Explained variance: 56.538%
Extraction method: Principal axis factoring
Rotation method: Varimax with Kaiser normalization
Cronbach's alpha for all items: 0.930

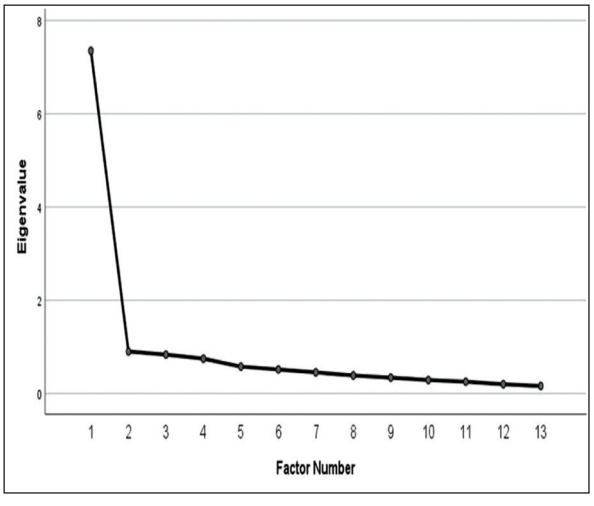

FIGURE 1: Scree plot

TABLE 4: Model fit indices.[35]

Fit Index	Excellent fit	Acceptable fit	Model value	Interpretation
χ^2	0≤ χ^2 ≤2 df	2df ≤ χ^2 ≤3 df	110.448 (df=410)	Excellent fit
χ^2/df	0≤ χ^2/df <3	3≤ χ^2/df ≤5	2.814	Excellent fit
RMSEA	0≤ RMSEA <0.05	0.05≤ RMSEA ≤0.09	0.089	Acceptable fit
RMR	0≤ RMR <0.05	0.05≤ RMR ≤0.10	0.049	Excellent fit
NFI	>0.95	0.90-0.95	0.929	Acceptable fit
CFI	>0.97	0.95-0.97	0.953	Acceptable fit
GFI	>0.95	0.80-0.95	0.915	Acceptable fit
p value	<0.001			

RMSEA: Root mean square error of approximation; RMR: Root mean square residual; NFI: Normal Fit Index; CFI: Comparative Fit Index; GFI: Goodness of Fit Index

scree plot also indicated a clear elbow, confirming the 1-factor structure (Figure 1).

PHASE 3: CONFIRMATORY FACTOR ANALYSIS RESULTS

In the next phase of validity and reliability analysis, confirmatory factor analysis was conducted. Two items with factor loadings below 0.30 were removed, and the model was tested with the remaining 11 items. Goodness-of-fit indices were as follows: χ^2=110.448, df=410, CMIN/df=2.814, root mean square residual (RMR)=0.049, Goodness of Fit Index (GFI)=0.915, Normal Fit Index (NFI)=0.929, Comparative Fit Index (CFI)=0.953, root mean square error of approximation (RMSEA)=0.089 (p<0.001) (Table 4).

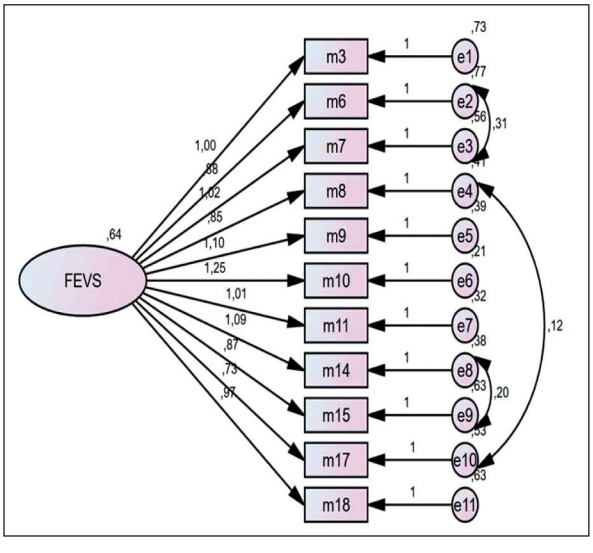

FIGURE 2: Path diagram

The path diagram obtained after the confirmatory factor analysis is presented in Figure 2. The factor loadings for the items in the model ranged from 0.63 to 0.91. Overall, the model showed a good level of fit.

RELIABILITY RESULTS

The internal consistency coefficient of the scale was calculated, and Cronbach's alpha was found to be 0.93. In addition, correlation analysis with the Fear of Violence Scale showed a moderately strong positive relationship (r=0.527; p<0.001).

DISCUSSION

The Fear of Exposure to Violence Scale developed in this study was designed to measure healthcare professionals' level of fear regarding the possibility of being subjected to violence. The psychometric properties of the scale were comprehensively tested. To examine the construct validity of the developed scale, exploratory factor analysis and confirmatory factor analysis were conducted with independent sample groups. According to Tabachnick and Fidell, the recommended sample size for exploratory factor analysis is at least 5-10 times the number of items.[28] Given that the draft scale initially contained 20 items, data from 204 participants were used for exploratory factor analysis, and the sample size was deemed sufficient. For confirmatory factor analysis, a sample of at least 200 participants is generally recommended for obtaining valid and reliable results.[29] Therefore, confirmatory factor analysis was performed with a separate group of 217 participants. The fact that both

analyses exceeded the minimum sample size recommendations supports the reliability of the construct validity findings. This section discusses the obtained findings in comparison with the existing literature.

Before conducting exploratory factor analysis, the Kaiser-Meyer-Olkin test yielded a value of 0.943, and Bartlett's test of sphericity was statistically significant. Büyüköztürk defines Kaiser-Meyer-Olkin values of 0.90 and above as indicating "excellent" sample adequacy.[30] Additionally, a significant Bartlett's test result indicates that the correlation matrix of the items is appropriate for factor analysis. In this context, the findings of the present study demonstrate that the sample size was highly adequate for conducting factor analysis. Similarly, Hair et al. noted that a Kaiser-Meyer-Olkin value above 0.90 indicates a robust data structure.[31]

In determining the factor structure of a scale, a factor loading of 0.45 or higher is generally considered acceptable.[30] As a result of exploratory factor analysis, seven items with factor loadings below 0.45 were excluded, leaving a single-factor structure with 13 items that explained 56.538% of the total variance. Büyüköztürk emphasizes that an explained variance of 50% or more is considered sufficient in scale development studies.[30] This finding indicates that the unidimensional structure of the scale sufficiently represents the construct being measured. Additionally, the factor loadings of the items, which ranged from 0.526 to 0.888, show that the items strongly and meaningfully reflect the underlying construct. Alpar states that factor loadings above 0.50 are practically significant, and those above 0.70 strongly explain the structure.[32] Accordingly, the items in the final structure are both practically meaningful and theoretically consistent.

In confirmatory factor analysis, factor loadings are expected to be no less than 0.30.[33] Therefore, 2 items with loadings below this threshold were removed, and the structure was refined to include 11 items. The model fit indices obtained (χ^2/df=2.694, RMSEA=0.089, CFI=0.953, GFI=0.915, NFI=0.929, RMR=0.049) were all within acceptable limits.[34] Çapık states that a χ^2/df value below three indicates acceptable fit and below 2 indicates good fit.[27] According to other sources, χ^2/df ratios below three reflect excellent fit, while values below 5 indicate moderate fit. Furthermore, RMSEA values between 0.08-0.10 are considered moderate, while CFI, GFI, and NFI values above 0.90 indicate good fit. Hair et al. similarly consider indices above 0.90 to be adequate indicators of model fitness.[31] Therefore, the values obtained in this study suggest that the model demonstrates excellent fit. Accordingly, it can be concluded that the 11-item version of the developed scale possesses strong construct validity.

The internal consistency of the scale was evaluated using Cronbach's alpha, which was calculated as 0.93. This value indicates a high level of reliability. Büyüköztürk defines alpha values above 0.90 as indicating excellent reliability.[30] Similar reliability coefficients have been reported in related studies. For example, in the Turkish adaptation of the Fear of Violence Scale, the internal consistency coefficient was reported as 0.98.[10] This demonstrates that the developed scale has strong and consistent reliability in comparison to similar instruments.

As part of the convergent validity analysis, a significant positive correlation was found between the newly developed scale and the previously established Fear of Violence Scale. Büyüköztürk suggest that a meaningful and moderate-to-high correlation between a new scale and an existing measure of the same construct supports its construct validity.[30] Accordingly, it can be concluded that the scale provides valid data regarding the construct it is intended to measure.

LIMITATIONS

This study has some limitations. First, data were collected through online platforms. Future studies may consider face-to-face data collection methods to obtain more representative samples. Second, the scale was developed exclusively for healthcare professionals; therefore, its generalizability to other occupational groups or cultural contexts may be limited. To broaden its applicability, further studies should test the scale's validity and reliability in diverse populations. Third, the sample predominantly consisted of female and nurse participants. While this distribution reflects the common gender and occupational com-

position observed in healthcare settings, it may limit the generalizability of the findings to all healthcare professionals. Therefore, the results should be interpreted with caution. Future studies are recommended to include more balanced and diverse samples in terms of profession and gender. Another limitation is the absence of test-retest reliability analysis. Future research is encouraged to assess the temporal stability of the scale. Finally, the study relied solely on quantitative methods, which may have limited a deeper understanding of participants' emotional experiences. Incorporating qualitative methods in future studies could help reveal the contextual and personal dimensions of fear of violence more comprehensively.

CONCLUSION

The Fear of Exposure to Violence Scale developed in this study is presented as a valid and reliable instrument designed to assess the level of fear healthcare professionals experience regarding the possibility of being subjected to violence-even if such incidents have not yet occurred. The finalized version of the scale consists of 11 items and a single factor. The scale does not include any reverse-coded items. Responses are scored on a 5-point Likert scale ranging from "1: Strongly disagree" to "5: Strongly agree." Total scores on the scale range from 11 to 55. Higher scores indicate a greater fear of exposure to violence. The internal consistency coefficient of the scale was calculated as 0.93. The high internal consistency, strong construct validity, and acceptable model fit values demonstrate the psychometric strength of the scale.

This scale offers significant potential for use in efforts to raise awareness and improve safety in healthcare settings. It also provides a valuable contribution to the literature by focusing not only on actual experiences of violence but also on the emotional responses to the perceived threat of such experiences. In future studies, the cross-cultural validity of the scale could be tested by administering it to different occupational groups and in various cultural contexts. Longitudinal studies could also explore the relationship between fear of exposure to violence and variables such as job satisfaction, burnout, and intention to leave the profession. These applications would contribute to a broader understanding of how fear of violence impacts healthcare workers and inform the development of targeted interventions.

Acknowledgement

We would like to thank health professionals for their valuable time.

Source of Finance

During this study, no financial or spiritual support was received neither from any pharmaceutical company that has a direct connection with the research subject, nor from a company that provides or produces medical instruments and materials which may negatively affect the evaluation process of this study.

Conflict of Interest

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

Authorship Contributions

Idea/Concept: *Sercan Mansuroğlu;* ***Design:*** *Sercan Mansuroğlu, Seda Tek Sevindik;* ***Control/Supervision:*** *Sercan Mansuroğlu, Seda Tek Sevindik, Mehmet Aykut Erk, Sunay Fırat;* ***Data Collection and/or Processing:*** *Sercan Mansuroğlu, Seda Tek Sevindik, Mehmet Aykut Erk, Sunay Fırat;* ***Analysis and/or Interpretation:*** *Sercan Mansuroğlu, Seda Tek Sevindik, Mehmet Aykut Erk, Sunay Fırat;* ***Literature Review:*** *Sercan Mansuroğlu, Seda Tek Sevindik, Mehmet Aykut Erk, Sunay Fırat;* ***Writing the Article:*** *Sercan Mansuroğlu, Seda Tek Sevindik, Mehmet Aykut Erk, Sunay Fırat;* ***Critical Review:*** *Sercan Mansuroğlu, Seda Tek Sevindik, Mehmet Aykut Erk, Sunay Fırat;* ***References and Fundings:*** *Sercan Mansuroğlu, Seda Tek Sevindik, Mehmet Aykut Erk, Sunay Fırat;* ***Materials:*** *Sercan Mansuroğlu, Seda Tek Sevindik, Mehmet Aykut Erk, Sunay Fırat.*

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