

Inter-level and Seasonal Variation in Reasons for Inappropriate Emergency Department Use: A Three Centers Study

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Abstract

Aim: Inappropriate emergency department (ED) use represents an important problem for health systems across the world. This study was designed to determine the reasons for inappropriate ED visits at different ED care levels during different seasons.

Materials and Methods: The study was conducted in three hospitals with different ED care levels in two periods (March and July). Physicians determined the appropriateness of ED visits. Data were collected through face-to-face interviews using a researcher-made questionnaire.

Results: The inappropriate ED visit rate was 75.6%. The most frequent reasons for inappropriate ED visits according to different ED care levels were as follows: Level 1, easy access (61.2%); Level 2, no other units providing health services outside of working hours (43.0%); and Level 3, perceived need for serum/injection treatment (58.2%). Inappropriate ED visits due to these reasons occurred more frequently in July than in March, with significant differences observed across the various levels of ED ($p < 0.005$). Of the inappropriate users, 36.3% reported that receiving treatment and care from the ED made them feel valued.

Conclusion: Easy access was the most common reason for inappropriate ED visits in both study periods. In addition, ED visits make some patients feel valued, which may lead to inappropriate use.

Keywords: Emergency department, emergency department visit, inappropriate use, primary care

Introduction

Inappropriate use of emergency departments (ED) is generally defined as the use of EDs for health problems that do not require emergency intervention and can be safely treated in another unit of a healthcare institution. While inappropriate use has been a significant problem for EDs for more than 50 years, standard criteria for assessing eligibility for ED visits have yet to

be developed. Criteria used by researchers vary, which leads to differences in the study results (1). A systematic review by Uscher-Pines et al. (2) found that the prevalence of inappropriate ED visits worldwide ranged from 8% to 62%.

Inappropriate use of EDs leads to delays in providing treatment, longer waiting times, difficulties in identifying patients, and increased health expenses (3). Increased workload, the inability to



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Cite this article as: İmamoğlu M, Şahin A.S, Şimşek P, Gönenç Çekiç Ö, Vuran H.S, Yadigaroglu M, Çiçek M, Burma E, Tatlı Ö, Gürsoy A, Topbaş M, Gündüz A. Inter-level and Seasonal Variation in Reasons for Inappropriate ED Use: A Three Centers Study. Eurasian J Emerg Med. 2024;23(2): 132-8.

Received: 25.09.2023
Accepted: 09.05.2024



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use emergency resources for emergency patients, and a negative psychological effect on health professionals are other problems arising from inappropriate ED use (4,5). In addition, patients who use EDs instead of primary healthcare services to monitor chronic diseases cannot receive the health education necessary to keep their chronic conditions under control, leading to recurrent exacerbations of symptoms and an increase in health expenses (6).

Globally, EDs are categorized into levels based on the services they offer. Factors affecting the tendency to visit EDs for non-emergency health problems and how they differ across various levels of EDs are unclear. However, various studies have identified several factors influencing the inappropriate use of EDs. These include the perceived need for immediate care for emergent health issues; the belief that specialized diagnostic and treatment methods are necessary; recommendations to use EDs made by healthcare professionals or the patients' relatives; the convenience of easy access; challenges in accessing primary healthcare services; the desire to avoid lengthy waits for care; the absence of health insurance; and the lack of alternative healthcare service options (1,7-10).

A review of the relevant literature indicates that, unlike the current study, previous research exploring the reasons for inappropriate ED use typically focused on a single level and one ED only.

This study investigated the reasons for inappropriate ED visits and analyze how these vary with seasonal changes and across different ED levels.

Materials and Methods

Study Design and Setting

This descriptive study was conducted at three different levels of EDs located in a province in the Black Sea Region of Turkey. The data collection periods were March 16-22, 2018, and July 22-28, 2018. In Turkey, EDs are stratified into three distinct levels based on specific criteria:

Level 1: General practitioners manage the front line, with on-call specialist overseeing processes. Patients whose conditions have stabilized but remain critical are referred to higher-level EDs for further treatment.

Level 2: General practitioners and emergency medicine specialists provide care, with oversight from at least one internal medicine specialist and one surgical specialist.

Level 3: Care is primarily provided by specialists in emergency medicine. In addition, comprehensive round-the-clock

healthcare services are maintained by specialist physicians in internal medicine, surgery, and women's and children's health.

The Level 1 ED where the study was conducted is located in a district state hospital with 14 beds, averaging 350 visits per day. The Level 2 ED, situated in a state hospital in the city center, has 25 beds and accommodates approximately 500 daily patients. The Level 3 ED is part of a university hospital with 38 beds and handles approximately 300 visits daily.

Selection of Participants

The study inclusion criteria included patients aged 18 years or older whose ED visits were considered inappropriate and who voluntarily participated in the study. Exclusion criteria encompassed any physical or mental conditions that could impede understanding of the study details, providing consent, or participating in the interview, as well as being under the influence of substances like alcohol or drugs that could impair cognitive functions.

Inappropriate Use of EDs

Criteria for inappropriate ED visits include: patients with Level 5 or Level 4 on the emergency severity index (ESI); those who, according to a physician's assessment, can wait at least 24 h for medical care and treatment; and patients not referred by another health service unit. In addition, visits are considered inappropriate if the patient's main complaint could be managed in outpatient clinics or by family physicians and if no surgical procedures are necessary, such as wound suturing. In Turkey because there are no alternative healthcare departments for procedures requiring suturing, casting, or splinting besides hospital EDs, visits for these services are not deemed inappropriate.

Data Collection Tools

The data were collected using a 30 question, four-part questionnaire designed to identify the reasons for inappropriate use of EDs. This questionnaire was designed on the basis of a review of existing literature and the clinical experiences of the researchers (1,11). The first section gathers sociodemographic information. The second section asked about the reasons for choosing to visit an ED. The third section collected opinions on EDs and the fourth assessed patients' perceptions of medical emergencies. Before launching the study, the clarity and appropriateness of the questionnaire were validated by five emergency physicians and five ED nurses. Additionally, a pilot study with 20 patients was conducted to test the questionnaire and make necessary adjustments. These pilot study participants were excluded from the main study sample.

Data Collection

ESI, a five-level ED triage algorithm developed in the USA in 1999, was used to assess the appropriateness of ED visits in terms of emergency need. This system categorizes patients on the basis of their primary complaints and resource needs. Before data collection, physicians working in the EDs where the study was conducted were trained on ESI and the criteria for inappropriate ED use. The trained physicians then determined the eligibility of the patients for the study. The questionnaire was administered face-to-face after the eligible patients had received treatment and care. This ensured that the responses accurately reflected the participants' experiences and perceptions.

Statistical Analysis

Data were analyzed using Statistical Package for the Social Sciences 21.0. Descriptive data are given in numbers and percentages. Qualitative data were evaluated using the chi-square test. The statistical significance level was set as <0.05.

Results

During the study period, a total of 13,221 ED visits were evaluated, of which 75.6% (n=10,001) were deemed inappropriate. Of those identified as inappropriate users, 54.3% consented to participate in the study. The participants' average age was 40.2 years (Standard deviation=16.4), ranging from 18 to 91 years, and 54.0% were female (Table 1).

In March and July, most inappropriate users across all three ED levels were women (p<0.05). In the Level 1 and Level 2 EDs, the most inappropriate users-63.7% and 42.9%, respectively-had received primary education or less. Conversely, in Level 3 ED, 44.6% of inappropriate users were university graduates or held higher academic degrees (p<0.005). Additionally, the proportion of married patients and those aged over 40 years in Level 1 ED were significantly higher at 77.7% and 59.0%, respectively, compared with the other levels (p<0.005). Furthermore, Level 2 ED had a higher percentage (34.8%) of inappropriate users with chronic diseases compared with the other levels (p<0.005).

The primary reasons for inappropriate usage varied significantly across the ED levels, as shown in Table 2. For Level 1, the most common reason was easy access to ED (806 cases, 61.2%); for Level 2, the predominant reason was that ED are the only health services available after working hours (1,207 cases, 43.0%); and for Level 3, the leading cause was patients' belief that their health condition necessitated intravenous serum or intramuscular injection treatments (761 cases, 58.2%). With the exception of seeking shelter, these differences in the reasons for inappropriate visits across ED levels were statistically significant (p<0.05).

In analyzing the seasonal variations in reasons for inappropriate ED visits, the most frequent justification in both March (47.5%) and July (52.5%) was the accessibility of ED locations. The second most common reason in March (39.3%) involved patients'

| | Level 1 | | Level 2 | | Level 3 | | X ² |
|-----------------------------------|---------|------|---------|------|---------|------|------------------|
| | n | % | n | % | n | % | p value |
| Age (n=5.430) | | | | | | | |
| <40 | 539 | 41.0 | 1.541 | 54.9 | 927 | 70.9 | 238.866 0.000 |
| >40 | 777 | 59.0 | 1.266 | 45.1 | 380 | 29.1 | |
| Sex (n=5.430) | | | | | | | |
| Female | 699 | 53.1 | 1.562 | 55.6 | 670 | 51.3 | 7.420 0.024 |
| Male | 617 | 46.9 | 1.245 | 44.4 | 637 | 48.7 | |
| Education status (n=4.908) | | | | | | | |
| Primary school and lower | 678 | 63.7 | 1.138 | 42.9 | 354 | 29.7 | 388.717 0.000 |
| High school | 240 | 22.6 | 856 | 32.3 | 307 | 25.7 | |
| University graduate or higher | 146 | 13.7 | 657 | 24.8 | 532 | 44.6 | |
| Chronic disease (n=5.430) | | | | | | | |
| Yes | 417 | 31.7 | 978 | 34.8 | 263 | 20.1 | 92.175 0.000 |
| No | 899 | 68.3 | 1829 | 65.2 | 1044 | 79.9 | |
| Marital status (n=4.570) | | | | | | | |
| Married | 892 | 77.7 | 1535 | 68.9 | 627 | 52.5 | 176.788 |
| Single | 256 | 22.3 | 692 | 31.1 | 568 | 47.5 | 0.000 |
| ED: Emergency department | | | | | | | |

Table 2. Reasons for choosing EDs (n=5.430) *

| Reasons | Level 1 n (%) | | | Level 2 n (%) | | | Level 3 n (%) | | | Total n (%) |
|---|------------------------|-------------|------------|---------------|------------|------------|---------------|------------|------------|-------------|
| | March | July | p value | March | July | p value | March | July | p value | |
| | ED** is easy to access | 330 (63.6) | 476 (59.7) | 0.160 | 328 (33.2) | 855 (47.0) | 0.000 | 363 (56.5) | 390 (58.6) | |
| Only EDs provide health services after working hours | 138 (26.6) | 428 (53.7) | 0.000 | 346 (35.0) | 861 (47.4) | 0.000 | 138 (21.5) | 251 (37.7) | 0.000 | 2162 (39.8) |
| My health problem requires serum/injection treatment | 159 (30.6) | 281 (35.3) | 0.082 | 44 (4.4) | 659 (36.2) | 0.000 | 641 (99.8) | 120 (18.0) | 0.000 | 1904 (35.1) |
| Emergency intervention is needed | 205 (39.5) | 333 (41.8) | 0.410 | 265 (26.8) | 516 (28.4) | 0.370 | 221 (34.4) | 246 (37.0) | 0.333 | 1786 (32.9) |
| Diagnosis/treatment is done quickly | 113 (21.8) | 368 (46.2) | 0.000 | 161 (16.3) | 455 (25.0) | 0.000 | 219 (34.1) | 205 (30.8) | 0.205 | 1521 (28.0) |
| I do not need to wait for the examination | 121 (23.3) | 369 (46.30) | 0.000 | 127 (12.8) | 466 (25.6) | 0.000 | 64 (10.0) | 154 (23.2) | 0.000 | 1301 (24.0) |
| Results of tests are provided more quickly | 106 (20.4) | 343 (43.0) | 0.000 | 103 (10.4) | 390 (21.5) | 0.000 | 133 (20.7) | 114 (17.1) | 0.099 | 1189 (21.9) |
| I trust EDs more than any other unit | 42 (8.1) | 97 (12.2) | 0.019 | 62 (6.3) | 163 (9.0) | 0.012 | 94 (14.6) | 81 (12.2) | 0.191 | 539 (9.9) |
| My health problems require special diagnostic methods | 25 (4.8) | 154 (19.3) | 0.000 | 12 (1.2) | 52 (2.9) | 0.005 | 47 (7.3) | 58 (8.7) | 0.352 | 348 (6.4) |
| Health professionals working in EDs are more experienced | 42 (8.1) | 84 (10.5) | 0.140 | 37 (3.7) | 89 (4.9) | 0.158 | 64 (10.0) | 9 (1.4) | 0.000 | 325 (6.0) |
| The department was recommended by others | 65 (12.5) | 52 (6.5) | 0.000 | 41 (4.1) | 31 (1.7) | 0.000 | 19 (3.0) | 21 (3.2) | 0.835 | 229 (4.2) |
| It is more economical to receive healthcare in EDs | 35 (6.7) | 83 (10.4) | 0.023 | 2 (0.2) | 4 (0.2) | 0.922 | 5 (0.8) | 0 (0.0) | 0.023 | 129 (2.4) |
| To be referred to a different health institution | 7 (1.3) | 40 (5.0) | 0.000 | 0 (0.0) | 13 (0.7) | 0.008 | 14 (2.2) | 6 (0.9) | 0.060 | 80 (1.5) |
| I am impressed by my immediate relatives' use of ED | 19 (3.7) | 32 (4.0) | 0.745 | 3 (0.3) | 18 (1.0) | 0.044 | 0 (0.0) | 6 (0.9) | 0.016 | 78 (1.4) |
| Obtaining a doctor's note for sick leave takes less time | 5 (1.0) | 19 (2.4) | 0.060 | 5 (0.5) | 11 (0.6) | 0.738 | 2 (0.3) | 2 (0.3) | 0.972 | 44 (0.8) |
| Scenes featuring EDs in TV series impacted my choice of EDs | 0 (0.0) | 6 (0.8) | 0.480 | 1 (0.1) | 21 (1.2) | 0.002 | 0 (0.0) | 0 (0.0) | - | 28 (0.5) |
| Because I do not have health insurance | 3 (0.6) | 13 (1.6) | 0.088 | 1 (0.1) | 7 (0.4) | 0.178 | 0 (0.0) | 1 (0.2) | 0.326 | 25 (0.5) |
| To receive narcotics | 2 (0.4) | 4 (0.5) | 0.759 | 0 (0.0) | 2 (0.1) | 0.297 | 0 (0.0) | 0 (0.0) | - | 8 (0.1) |
| To find shelter | 0 (0.0) | 2 (0.3) | 0.253 | 0 (0.0) | 2 (0.1) | 0.297 | 0 (0.0) | 0 (0.0) | - | 4 (0.1) |

*n number was increased because multiple options were checked, **ED: Emergency department

beliefs that their health issues required intravenous serum or intramuscular injection treatments, whereas in July (47.0%), the predominant reason was that EDs were the only available health services after working hours. The third most cited reason for visits during both March (32.1%) and July (33.4%) was the perceived need for urgent intervention.

Among the participants, 36.3% reported that receiving treatment and care from EDs made them feel valued (Table 3). Participants with primary and high school education reported a higher sense of feeling valued when admitted to the ED (38%) than those with undergraduate and higher education (31.8%), with a statistically significant difference ($p < 0.0005$). Additionally, 15.7% of participants noted that visiting the ED drew the attention of their relatives. This perception was more common among those over 40 years of age (17.6%), married (17.1%), and patients without undergraduate education (16.0%) ($p < 0.05$) (Table 3). No significant correlations were observed between other descriptive characteristics and opinions ($p > 0.05$).

The study also assessed participants' perceptions of the purpose of emergency services. Among inappropriate users, 68.1% believed that EDs were intended for "health problems that require immediate intervention", while 26.0% thought EDs serve "all kinds of health problems, regardless of urgency". Additionally, 2.6% of the participants ($n = 143$) indicated that ED offer services for a general examination from head to toe.

Among the participants, 57.8% described their health issues as "urgent" and 14.7% as an "emergency", while 27.5% labeled them as "non-urgent". Significant differences were observed in the participants' perceptions of urgency across study periods and levels of EDs ($p < 0.05$) (Table 4). Additionally, the perception of health problems as urgent or emergency was more prevalent among females (74.2%) than among males (68.2%)

($p < 0.0005$), among those with a chronic disease (73.9%) than among those without (70.4%) ($p = 0.029$), and among individuals without undergraduate education (73.6%) than among those with a graduate degree (68.6%) ($p < 0.0005$).

The average waiting time expected by inappropriate users to be examined and receive care in the ED was 27.4 ± 34.0 min (min. 0 min, max. 360 min). Among the participants, 60.8% reported that they were willing to wait for a maximum of one hour.

Discussion

Main Findings

In our study, the incidence of inappropriate use was 75.6%. The distribution of these inappropriate visits varied according to season and ED level, as detailed in the study by Gunduz et al. (12), and the reasons for such usage were further explored in our study. The study identified significant differences between the ED levels regarding the reasons for inappropriate use. The most prevalent reason for inappropriate use at Level 1 ED was “easy access”; at Level 2, it was “the absence of other health services providers after working hours”; and at Level 3, the predominant reason was “patients’ belief that their health issue required intravenous serum/ intramuscular injection treatment”. Seasonal analysis revealed that “easy access” remained the most common reason for inappropriate use across both study periods.

Furthermore, approximately one-third of the participants reported feeling valued upon admission to the ED, while roughly one-fourth of the inappropriate users believed that EDs should address all types of health problems, regardless of their urgency.

In the Level 3 ED, most inappropriate visits were primarily for serum or injection therapy. In a related study by Tatlı et al. (13) conducted at the same center, it was found that 82.3% of ED visits, including patients and their relatives, sought serum/ injection treatment; however, the study did not address the appropriateness of these visits. Similarly, Gentile et al. (14) reported that 37.6% of inappropriate ED visits were for obtaining medication. Amiel et al. (9) noted that this motive accounted for 69% of the visits. These findings align with the results of the current study.

The primary reason for inappropriate use at Level 2 ED was the absence of alternative health service providers after working hours, a factor also identified in other studies conducted in Turkey (7,15). The Level 1 ED, where the study was conducted, is situated in a rural area characterized by widespread agricultural activities. In contrast, the Level 3 ED is located within a university hospital and primarily serves a student population. Given its location in the city center, Level 2 ED primarily serves a population of working individuals. Therefore, it is likely that the proportion of individuals required to work during traditional working hours is higher in the community served by the Level 2 ED than in those served by Level 1 and Level 3 EDs. This demographic feature of the served community may explain the observed differences in ED usage patterns across the levels.

Various countries have implemented policies to extend primary healthcare services beyond traditional hours to reduce inappropriate ED visits resulting from the unavailability of these services outside regular working hours. Buckley et al. (17) showed that this method reduced visits with low urgency by 7.04%, and Daniel (16) reported that it reduced non-urgent visits by 0.03%.

Table 3. Opinions of inappropriate users about the social benefits of choosing EDs (n=5.430)*

| Benefits | n | % |
|---|------|------|
| Makes me feel valuable | 1970 | 36.3 |
| Helps me gain the attention of my relatives | 854 | 15.7 |
| Makes it easier for me to express my problems | 331 | 6.1 |
| Helps me get the attention of the ED team | 320 | 5.9 |
| Allows me to enter a different social environment | 199 | 3.7 |
| Allows me to establish social communication | 209 | 3.8 |

*The n number was increased because multiple options were checked.
ED: Emergency department

Table 4. Participant opinions on perceived urgency levels of health issues according to different periods and levels of ED

| | Level 1 n (%) | | Level 2 n (%) | | Level 3 n (%) | | Total n=5.351 |
|------------|------------------|-----------------|------------------|------------------|------------------|-----------------|------------------|
| | March (n=518) | July (n=785) | March (n=977) | July (n=1791) | March (n=641) | July (n=639) | |
| Emergency | 34 (6.6) | 126 (16.1) | 162 (16.6) | 240 (13.4) | 133 (20.7) | 93 (14.6) | 788 (14.7) |
| Urgent | 368 (71.0) | 422 (53.8) | 469 (48.0) | 1132 (63.2) | 331 (51.6) | 369 (57.7) | 3091 (57.8) |
| Non-urgent | 116 (22.4) | 237 (30.2) | 346 (35.4) | 419 (23.4) | 177 (27.6) | 177 (27.7) | 1472 (27.5) |
| p value | <0.0005 | | <0.0005 | | 0.01 | | |

Bonferroni correction was applied for pairwise comparisons ($p = 0.016$). Statistical differences in perceived urgency between March and July were as follows: in Level 1, all binary comparisons; Level 2, “emergency and urgent” and “non-urgent and urgent”; in Level 3, urgent and emergency.
ED: Emergency department

However, Nagree et al. (18) found that this method did not affect the rate of non-urgent visits. In Turkey, some centers offer outpatient services outside regular working hours during certain periods. However, no research has demonstrated the impact of this practice on ED visits in Turkey.

Easy access was identified as the most common reason for inappropriate use at Level 1 ED. This trend is associated with the ED's central location in an area characterized by rough terrain. Additionally, when analyzing the reasons for inappropriate use by season, it was found that easy access remained the most common reason in both study periods, March and July. Another study conducted in Turkey found that 12.8% of inappropriate ED visits were attributed to the facility's proximity to patients (15). In contrast, a study by Amiel et al. (9) in England reported a much higher rate of 46% for similar reasons. Meanwhile, an additional study in the UK identified a considerably lower rate of 6.5% for visits influenced by the ED's vicinity (10). In Belgium, the rate of inappropriate ED visits attributed to the proximity of the facilities was 21.3%, whereas in Malaysia, it was slightly higher at 27% (19, 20). Therefore, when assessing inappropriate visits related to the closeness of EDs, it is crucial to compare the distances between EDs and alternative healthcare units.

Approximately one-quarter of the participants visited the ED because diagnostic and treatment procedures were performed quickly (28%), and there was no need to wait in line for examination (24%). In an international study covering 34 countries, while the rate of ED visits due to short waiting times was below 5% in most countries, it was determined to be 20% in Turkey (21). These results indicate that the rate of inappropriate visits due to short waiting times in Turkey is higher than the global average.

Conditions affecting ED visits are explained by the conceptual model developed by Andersen and Newman. According to the model, the main factors affecting ED visits are demographic characteristics, the health system, and factors related to the health problem (22). In our study, apart from the factors mentioned in the model, it was determined that receiving treatment and care from the ED affected ED visits by leading to individual perceptions such as feeling valuable (36.3%) and gaining the attention of relatives (15.7%).

It was determined that 57.8% of the participants evaluated their health problem as "urgent" and 14.7% as "emergency". Similar to our study, Ahmed et al. (23) found that 54% of inappropriate users defined their health problem as "emergency" and 37% of the participants perceived as "urgent". In the study by Nelson (8), none of the inappropriate users defined their health problem as "emergency", but 48% defined it as "urgent".

Our study determined that approximately one-third of the participants (32.9%) visited the ED because they believed that urgent intervention was necessary for their complaint. The rate of inappropriate visits due to perceived urgency was 14.5% in another study conducted in Turkey (7). This rate was 85% in the study by Selasawati et al. (20) and was similar to our findings at 33.2% in the study by Detollenaere et al. (19). Variations in these research results may be associated with differences in the public's level of knowledge about emergency health issues.

Study Limitations

Some participants left the interview before completing the form, resulting in incomplete demographic data for certain patients.

Conclusion

Inappropriate attendance constitutes a significant portion of ED usage. The predominant reasons for such misuse varied by level: "easier access" at Level 1, "lack of other healthcare services outside normal working hours" at Level 2, and "perceived need for serum/injection treatment" at Level 3. Additionally, patients often prefer EDs for non-emergency health issues because the care received makes them feel valued. Seasonal analysis also revealed that "easy access" was consistently the most common reason for inappropriate use across both study periods. The insights from this study elucidate the motivations driving individuals to use EDs for non-emergency situations and could inform strategies aimed at reducing inappropriate ED use.

Ethics

Ethical Committee Approval: Karadeniz Technical University Scientific Research Ethics Committee Hospital (ethics committee decision number: 24237859-562, date: 12.10.2016).

Informed Consent: Consent form was filled out by all participants.

Authorship Contributions

Surgical and Medical Practices - Concept: A.Y., M.T., A.G., Design: A.Y., M.T., A.G., Data Collection or Processing: M.İ., A.S.Ş., P.Ş., Ö.G.Ç., H.S.V., M.Y., M.Ç., E.B., Analysis or Interpretation: P.Ş., Ö.T., Literature Search: P.Ş., M.Y., M.Ç., Writing: M.İ., A.S.Ş., P.Ş., Ö.T.

Conflict of Interest: The authors declare no conflict of interests.

Financial Disclosure: This study was conducted with the support of the Scientific and Technical Research Council of Turkey (TÜBİTAK) within the 3001-Starting R&D Projects Support Program under project number: 216S972. We would like to thank TÜBİTAK for its support.

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