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The Iatrogenesis Perception Scale: A Methodological Study

Ali Göde[1,*,a]

[1] *Mustafa Kemal Üniversitesi, Hatay Sağlık Hizmeteleri Meslek Yüksekokulu, Hatay, Türkiye.*

**Corresponding Author*

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ABSTRACT

The study focuses on developing a scale to measure the perception of iatrogenesis, a concept referring to unintended health consequences caused by medical interventions. Understanding iatrogenic effects is crucial for healthcare professionals, researchers, and policymakers to improve patient safety and healthcare quality. The research draws on Ivan Illich's framework, which categorizes iatrogenesis into clinical, social, and cultural dimensions, highlighting the broader societal and cultural impacts of medicalization. The study employed a quantitative research design using a survey method. Data were collected from 539 adult participants in Turkey through convenience sampling. The Perception of Iatrogenesis Scale, initially comprising 28 items, was developed based on Illich's work and refined through expert feedback. Statistical analyses included Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) to assess construct validity, while Cronbach's Alpha values were used to evaluate reliability. The scale's criterion-related validity was examined using the Distrust in the Health System Scale. The final scale consisted of 19 items across three dimensions: clinical, social, and cultural iatrogenesis. EFA revealed a three-factor structure explaining 50.022% of the total variance, with factor loadings ranging from 0.52 to 0.72. CFA confirmed the model's acceptable fit (GFI = 0.924, RMSEA = 0.056). Reliability analysis showed Cronbach's Alpha values between 0.60 and 0.862, indicating acceptable to high reliability, although some subdimensions exhibit relatively limited internal consistency. A positive correlation was found between distrust in the health system and the perception of iatrogenesis ($p<0.001$). The Perception of Iatrogenesis Scale is a valid and reliable tool within the scope of this study for assessing individuals' perceptions of unintended medical outcomes. It may provide valuable insights for identifying and mitigating iatrogenic risks in healthcare. The findings highlight the importance of addressing clinical, social, and cultural dimensions of iatrogenesis in efforts to enhance healthcare safety and effectiveness. Future research could explore the scale's applicability in diverse populations and healthcare settings.

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İyatrojenez Algı Ölçeği: Metodolojik Bir Çalışma

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ÖZ

Bu çalışma, tıbbi müdahaleler sonucu ortaya çıkan istenmeyen sağlık sonuçlarını ifade eden iyatrojenez algısını ölçmeye yönelik bir ölçek geliştirmeyi amaçlamaktadır. İyatrojenik etkilerin anlaşılması, hasta güvenliğinin ve sağlık hizmeti kalitesinin artırılması açısından sağlık profesyonelleri, araştırmacılar ve politika yapıcılar için büyük önem taşımaktadır. Araştırma, iyatrojenezi klinik, sosyal ve kültürel boyutlar çerçevesinde ele alan Ivan Illich'in kuramsal yaklaşımına dayanmaktadır ve tıbbileşmenin toplumsal ve kültürel etkilerine dikkat çekmektedir. Çalışmada nicel araştırma deseni benimsenmiş ve veri toplama yöntemi olarak anket tekniği kullanılmıştır. Veriler, Türkiye'de yaşayan 539 yetişkin katılımcıdan kolayda örnekleme yöntemiyle elde edilmiştir. Başlangıçta 28 maddeden oluşan İyatrojenez Algısı Ölçeği, Illich'in kuramsal çerçevesi temel alınarak geliştirilmiş ve uzman görüşleri doğrultusunda revize edilmiştir. Yapı geçerliliğini değerlendirmek amacıyla Açımlayıcı Faktör Analizi (AFA) ve Doğrulayıcı Faktör Analizi (DFA) uygulanmış, güvenirlik ise Cronbach Alfa katsayısı ile test edilmiştir. Ölçeğin ölçüt ilişkili geçerliliği, Sağlık Sistemine Güvensizlik Ölçeği kullanılarak incelenmiştir. Elde edilen bulgulara göre ölçek, klinik, sosyal ve kültürel iyatrojenez olmak üzere üç boyuttan oluşan 19 maddelik bir yapıya sahiptir. AFA sonuçları toplam varyansın %50.022'sini açıklayan üç faktörlü bir yapı ortaya koymuş ve faktör yüklerinin 0.52 ile 0.72 arasında değiştiği belirlenmiştir. DFA sonuçları modelin kabul edilebilir uyum düzeyine sahip olduğunu göstermiştir (GFI = 0.924, RMSEA = 0.056). Güvenirlik analizleri Cronbach Alfa değerlerinin 0.60 ile 0.862 arasında değiştiğini göstermiş ve bazı alt boyutlarda görece sınırlı olmakla birlikte genel olarak kabul edilebilir düzeyde güvenirliğe işaret etmiştir. Ayrıca sağlık sistemine duyulan güvensizlik ile iyatrojenez algısı arasında pozitif yönlü anlamlı bir ilişki bulunmuştur ($p<0.001$).

[a] *ali.gode@mku.edu.tr* [a] *https://orcid.org/0000-0002-6865-6298*

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Introduction

Etymologically, the concept of "*iatrogenesis*" comes from the Greek *iatros*, meaning *doctor* and *genos*, meaning origin or causes. It describes conditions caused by the physician (Moutaouakkil et al., 2017). This concept is used for undesirable situations that occur during treatment or diagnosis. For example, misdiagnosis and allergic reaction of the patient as a result of incorrect drug treatment can be shown as iatrogenesis.

Ivan Illich has been doing research especially on this subject. This research, which can be considered as a medical critique, uses the preface "medicalization" to give rise to the concept of iatrogenesis, which Illich uses in his book. Thus, he defined iatrogenic disease as a disease that characterizes all clinical conditions in which doctors, drugs, laboratories or hospitals, and all kinds of medical devices are pathogenic agents (De Oliveira, 2021). Illich, who believes that doctors and medical professionals have a role in the deterioration of public health, explains the medicalization of society and the harms caused by medical devices with the concepts of clinical iatrogenesis, social iatrogenesis and cultural iatrogenesis in his work dedicated to analyzing the theme of health (Illich, 2019).

Clinical Iatrogenesis: According to Illich, the medical institution and doctors do not have as much influence on health as one might think. Today, the growing medical institution has no effect on the positive progress of health. He argues that with the medical profession, people give up their freedom and become unhealthily dependent on physicians and health institutions. According to Illich, the side effects experienced by symptomatic people due to the treatments they receive from physicians, medicines or hospitals are a superstitious reshaping of society and culture through the internalization of the myths of medicine. Iatrogenesis can be clinical in the form of injuries inflicted on patients by ineffective, toxic and unsafe treatments (Biley, 2010). According to him, medical advances do not contribute to the healing process of some venereal diseases such as typhoid fever and malaria; healing occurs over time based on the immunity developed by the society due to its living and nutritional conditions. In addition, continuing medical treatment when there is no benefit does more harm than good because of the side effects it may cause. According to Illich, who also deals with the use of unnecessary prescribed medication and excessive medication, especially in the process of drug treatment, drugs are a potential poison. People take the wrong medication, take old medication or medication contaminated with other substances, take the wrong dose of medication, swallow counterfeit medication, take medication that can form dangerous compounds together, and get injections with poorly sterilized syringes (Illich, 2019). For these reasons, drugs can cause both addiction and disabling effects. In addressing some of the causes of iatrogenesis caused by drugs, Illich highlighted some factors that are not directly linked to the doctor-patient relationship as described above, but also link to other external factors such as the role of the pharmaceutical industry in advertising and commercial promotion expenditures (Gönç Şavran, 2019). Clinical iatrogenesis encompasses poor health caused by medical devices, doctors' misdiagnosis and treatment, and medications.

Social Iatrogenesis: The state budget supports organizations such as pharmaceutical companies that do not benefit health and even create unhealthy conditions. Budgetary support, even though it does not provide any benefit to the public, worsens health. Illich defines this situation as social iatrogenesis (De Oliveira, 2021). This term refers to any deterioration in the health of the individual due to socio-economic transformations made possible, desirable, and necessary by the institutional forms that health systems take (Illich, 2019). According to Illich, in order to shape the medicalization of society, medical technology, together with the sense of curiosity it creates in people, implants the idea that people's health improves as they receive prostheses, medicines, hospitalizations for preventive checks and treatments (Biley, 2010). Belief in this state of affairs leads the public to tolerate the dehumanization of medicine. Underpinned by this belief, the medical system renders people incapacitated and dependent on themselves, removing the ability of individuals to cure their own illnesses. In this way, individuals leave themselves to medical technology, doctors or medicines, causing the desire to take care of their own health to diminish or disappear (Barnet, 2003). Moreover, the medicalization of the family structure in society is taking place at the point where, thanks to our advances in scientific knowledge and technology, dying at home has become socially unthinkable, where programs are so regulated and life is so organized that aging at home becomes more painful rather than more beautiful (Illich, 1975, 2019). By making people think in this way, health services make people want to be healthy and cause individuals' hopes to be sold as a commodity. These thoughts and systems create a social iatrogenesis by causing health deterioration.

Cultural Iatrogenesis: It refers to the destruction by medicine of the traditional ways of coping with pain-based situations such as illness and death (Lupton, 2005). Medicalization creates a bureaucratic system based on the denial of every human being's need to cope with illness, pain and death (Illich, 2019). Every culture has its own instinct to suffer and cope with illness; however, medical services and doctors prevent this. The health culture belonging to the traditions taken from the hands of people is handed over to the hands of doctors, causing cultural iatrogenesis. According to Illich, feeling pain is not only a nervous or individual reaction, but also has something to do with culture (Gönç Şavran, 2019). The individual has learned to fight pain according to the traditions of the culture in which he/she lives; he/she challenges pain with the support of cultural elements such as patience, prayer, meditation, self-restraint, and trust. In this respect, culture makes pain bearable. Industrial health characterizes pain as a nuisance, as a condition that requires urgent intervention (Moutaouakkil et al., 2017). Medicine objectifies pain by accepting it as a verifiable, measurable plane. This undermines the non-valuable and non-transferable nature of pain in the social value system determined by culture (Lupton, 2005). People perform some traditional rituals from birth to death. These rituals, which vary from culture to culture, have a social purpose in coping with pain. As medicine has developed, the ability to interpret pain, which

culturally exists in people, has begun to be handed over to doctors. The idea that diseases are something that cannot be dealt with on their own leads to a decrease in the use of traditional healing methods, and the ability to heal is left to the medical institution and doctors. The doctor is considered as a savior who enables the prevention of health problems such as death, illness and disability (Gönç Şavran, 2019). It is the commercialization of medicine that Illich most wants to draw attention to. People often feel that they cannot cope with problems such as exercise, weight control, diet and even the common cold without specialized and costly "professional" intervention. Many of these activities were previously "local" or "family and community". With these developments, the traditional skills and customs that allowed family and friends to provide care at home have weakened and self-reliance has declined (Barnet, 2003). For this reason, the medical system, which has taken on a sacralized structure, interferes with the traditional values of the community in cases of pain, suffering and death, causing cultural iatrogenesis.

To summarize Ivan Illich's idea, iatrogenesis refers to the ways in which people's health is worsened rather than improved through poor or inadequate diagnoses and treatments, health policies that are to the detriment of society, and the suppression of people's cultural responses to illness, suffering and death.

Beyond Illich's foundational framework, contemporary literature has increasingly emphasized the role of patient safety, healthcare system trust, and modern medical sociology in understanding the unintended consequences of medical interventions. Patient safety research highlights that medical errors, adverse events, and system-level failures are critical determinants of negative health outcomes, reinforcing the relevance of iatrogenesis in modern healthcare systems. In addition, trust in healthcare systems has emerged as a key factor influencing how individuals perceive medical interventions and associated risks. Lower levels of trust have been associated with increased sensitivity to potential harms and a heightened perception of negative healthcare outcomes. Furthermore, recent developments in medical sociology have expanded the understanding of medicalization, focusing on the social construction of health, the role of healthcare institutions, and the power dynamics between patients and medical professionals. These perspectives complement Illich's critique by providing a more contemporary and multidimensional framework for interpreting iatrogenesis. In this context, the present study integrates Illich's theoretical approach with contemporary perspectives on patient safety, healthcare trust, and medical sociology to provide a more comprehensive conceptual foundation for the development of the Iatrogenesis Perception Scale.

This research focuses on the process of developing a scale to more deeply understand and measure the concept of iatrogenesis. Understanding iatrogenic effects is vital for health professionals, researchers and policy makers. The developed scale will be an effective tool to identify, analyze and mitigate iatrogenic risks in healthcare.

This study aims to develop a valid and reliable scale to measure individuals' perceptions of iatrogenesis based on Ivan Illich's theoretical framework. The proposed scale is structured around three core dimensions (clinical, social, and cultural iatrogenesis) and is intended to provide a comprehensive tool for assessing how individuals perceive the unintended consequences of medical interventions.

Methods

Purpose of the research

This study was conducted to develop a tool to measure the perception of iatrogenesis, which is a situation that occurs unintentionally during treatment or diagnostic procedures.

Universe and sample

The population of this study consists of adults aged 18 years and over living in Turkey. Selecting the participants among individuals who can make physically, cognitively and emotionally independent decisions will increase the reliability of the data obtained. The method to be used in sample selection is an important factor that directly affects the representativeness of the population. In this study, a convenience sampling method was preferred due to time and accessibility constraints. While this method enabled efficient data collection, it does not ensure that the sample fully represents the target population.

In scale development research, the recommended sample size is generally suggested to be between five and ten times the number of items included in the scale (Grove et al., 2012; Şencan, 2005). Based on this guideline, the sample size of 280 participants was deemed adequate for the present study, which comprises 28 items. In addition, according to the Turkish Statistical Institute (TUIK) data for 2023, the total number of adult individuals residing in Turkey is 60 million 229 thousand 333 (TÜİK, 2022). Considering this population, sampling tables according to the 95% confidence interval show that 384 participants would be sufficient (Altunışık et al., 2012; Kalaycı, 2017). The study was carried out within the designated time frame, and data were collected from a total of 539 adult participants. In line with the relevant literature, this sample size was considered adequate, and the collected data were included in the analysis.

Data collection tools

The data collection instrument is composed of three sections. The first section is the Personal Information Form, which gathers participants' socio-demographic characteristics and includes four items related to gender, age, marital status, and educational level. This scale was developed specifically for this study based on the theoretical framework of Ivan Illich. It has not been previously published. The English version of the finalized 19-item scale is provided as a supplementary file.

The development of the Iatrogenesis Perception Scale followed a systematic multi-stage process. Initially, an extensive pool of items was generated based on with reference to the book titled The Usurpation of Health, written by Ivan Illich and translated by Süha Sertabiboğlu (2019) theoretical framework of iatrogenesis and a comprehensive review of the relevant literature. At this stage, approximately 35–40 items were created to ensure broad coverage of the construct, including its clinical, social, and cultural dimensions. Subsequently, the initial item pool was evaluated by a panel of four experts, including one specialist in measurement and evaluation and three academics with experience in health sciences and scale development. The experts assessed each item in terms

of relevance, clarity, and representativeness of the construct. Based on their feedback, items were revised, merged, or eliminated to improve content validity and conceptual consistency. Although a formal Content Validity Index (CVI) or Lawshe's content validity ratio was not calculated, the evaluation process was conducted systematically through expert consensus. Each item was reviewed in detail, and revisions were made based on structured feedback from the experts. This qualitative evaluation process ensured that the items adequately reflected the theoretical dimensions of iatrogenesis and supported the content validity of the scale. The use of expert consensus as a content validation approach is widely accepted in early-stage scale development studies, particularly when the primary aim is to ensure conceptual clarity and theoretical alignment. To further enhance the comprehensibility and applicability of the items, a pilot study was conducted with a group of 42 individuals who shared similar characteristics with the target population. Participants were asked to evaluate the clarity and understandability of the items. Based on the feedback obtained from both expert evaluation and the pilot application, the item pool was refined and reduced to a draft form consisting of 28 items. The final draft scale was structured using a 5-point Likert-type format ranging from 1 ("Strongly disagree") to 5 ("Strongly agree"), with higher scores indicating a higher level of perceived iatrogenesis.

In the third part, the Distrust in the Health System Scale was used to assess the context validity of the scale. Context validity is testing whether a measurement tool works consistently, meaningfully and accurately in the context in which it is applied. Yeşildal, Erişen, and Kıraç (2020) adapted the Distrust in Health System Scale to Turkey. The scale, which has a unidimensional structure, consists of 10 items and is answered with a 5-point Likert-type rating. Participants marked the most appropriate option on a scale ranging from "1 - Strongly Disagree" to "5 - Strongly Agree". The arithmetic mean of the scores obtained from the scale is calculated, and a score closer to 5 indicates a high level of distrust towards the health system, while a score closer to 1 indicates a low level of distrust. In the Turkish adaptation study, Cronbach's Alpha coefficient expressing the internal consistency of the scale was calculated as 0.789.

Data Collection and Analysis

After obtaining the necessary ethical permissions, the data were collected with the participation of adult individuals living in Turkey. The study was conducted on a voluntary basis using a web-based scale form created through Google Form. The study was conducted between January 15, 2024 and February 15, 2024. Before the data collection form was applied, the purpose of the study was explained to the participants and an information text was presented. It was stated in the text that participation in the study was voluntary. The online survey took approximately 10 minutes to complete. The questionnaire form was shared through personal relationships, e-mail groups and social media and data were collected.

The collected data were analyzed using SPSS version 26.0 and AMOS version 24. In line with scale development procedures, item–total correlation analysis, Cronbach's alpha reliability analysis, Exploratory Factor Analysis (EFA), and Confirmatory Factor Analysis (CFA) were employed. The level of statistical significance for item analyses was set at $p < 0.05$. To examine whether the developed scale functioned consistently, meaningfully, and accurately within the applied context, contextual validity was assessed using Pearson correlation analysis. Based on the applied analytical procedures and the distribution of retained items, the final form of the Iatrogenesis Scale was established.

Results

The distribution of participants' socio-demographic characteristics is presented in Table 1.

Table 1. Socio-Demographic Characteristics of the Participants

Socio-Demographic Characteristics	Variables	Number (n)	Percentage (%)
Gender	Female	389	72.2
	Male	150	27.8
Age	18-24 years old	327	60.8
	25-29 years old	114	21.2
	30 years and over	98	18.2
Marital status	Single	442	82.0
	Married	97	18.0
Education	Primary/Middle School	43	8.0
	High school	105	19.5
	University	391	72.5
TOTAL		**539**	**100.00**

539 adult individuals participated in the study. According to the socio-demographic characteristics in Table 1, 72.2% (n=389) of the participants were female and 27.8% (n=150) were male. Regarding the age distribution of the participants, 60.8% (n=327) were between the ages of 18-24, 21.2% (n=114) were between the ages of 25-29 and 18.2% (n=98) were 30 years and older. 82% (n=442) of the participants were single and 18% (n=79) were married. When the educational status of the participants was analyzed, it was determined that 8% (n=43) had

primary/secondary school education, 19.5% (n=105) had high school education and 72.5% (n=391) had university education.

To examine the statistical construct validity of the scale, EFA was initially performed. Prior to the factor analysis, Kaiser–Meyer–Olkin (KMO) and Bartlett's Test of Sphericity were applied to assess the adequacy of the data for factor extraction. The KMO coefficient evaluates both sample adequacy and the suitability of inter-item correlations for factor analysis. According to the criteria proposed by Kalaycı (2017), KMO values of 0.90 and above indicate excellent adequacy, values between 0.80–0.90 are considered very good, 0.70–0.80 good, 0.60–0.70 moderate, 0.50–0.60 weak, and values below 0.50 unacceptable.

In factor analysis, factor loadings represent the strength of the relationship between items and their corresponding factors, with higher absolute values indicating stronger associations. Loadings of 0.50 or higher are generally regarded as satisfactory, regardless of direction, and are commonly used as a criterion for item retention or elimination. Items loading substantially on more than one factor are considered to create factor complexity (Coşkun et al., 2017; Kalaycı, 2017; Özdamar, 2017). Within this framework, items numbered 2, 3, 4, 6, 16, 17, 18, 20, and 22 were excluded from the scale based on multiple criteria rather than relying solely on item–total correlation values. Specifically, item retention decisions were guided by factor loadings, cross-loading patterns, and conceptual consistency with the underlying theoretical framework. Items with low factor loadings, significant cross-loadings, or weak theoretical alignment were excluded from the scale. This multi-criteria approach ensured that the final set of items not only met statistical requirements but also adequately represented the conceptual dimensions of iatrogenesis.

Table 2. Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5.708	30.042	30.042	5.708	30.042	30.042
2	2.392	12.588	42.630	2.392	12.588	42.630
3	1.404	7.392	50.022	1.404	7.392	50.022
4	.972	5.117	55.139			
5	.812	4.273	59.412			
6	.765	4.025	63.437			
7	.720	3.790	67.227			
8	.694	3.653	70.879			
9	.653	3.439	74.318			
10	.610	3.210	77.528			
11	.592	3.118	80.646			
12	.572	3.010	83.656			
13	.524	2.757	86.413			
14	.481	2.531	88.944			
15	.473	2.491	91.434			
16	.450	2.370	93.805			
17	.436	2.295	96.100			
18	.390	2.051	98.151			
19	.351	1.849	100.000			

KMO=0.899; **Bartlett's X^2=**3179.92; *p<.05*

An examination of Table 2 indicates that the first factor accounted for 30.042% of the total variance, representing the most substantial contribution to the scale structure. The second factor explained 12.588% of the variance, while the third factor accounted for 7.392%. Collectively, these three factors explained 50.022% of the total variance, which is considered acceptable for multidimensional scale development studies. The distribution of variance across factors suggests that the construct of iatrogenesis perception is composed of multiple interrelated dimensions rather than a single dominant factor. In addition, Harman's single-factor test was conducted to assess the potential impact of common method bias. The results indicated that a single factor did not account for the majority of the variance, with the first factor explaining 30.042% of the total variance. Since this value is below the commonly accepted threshold of 50%, it can be concluded that common method bias is not a significant concern in this study.

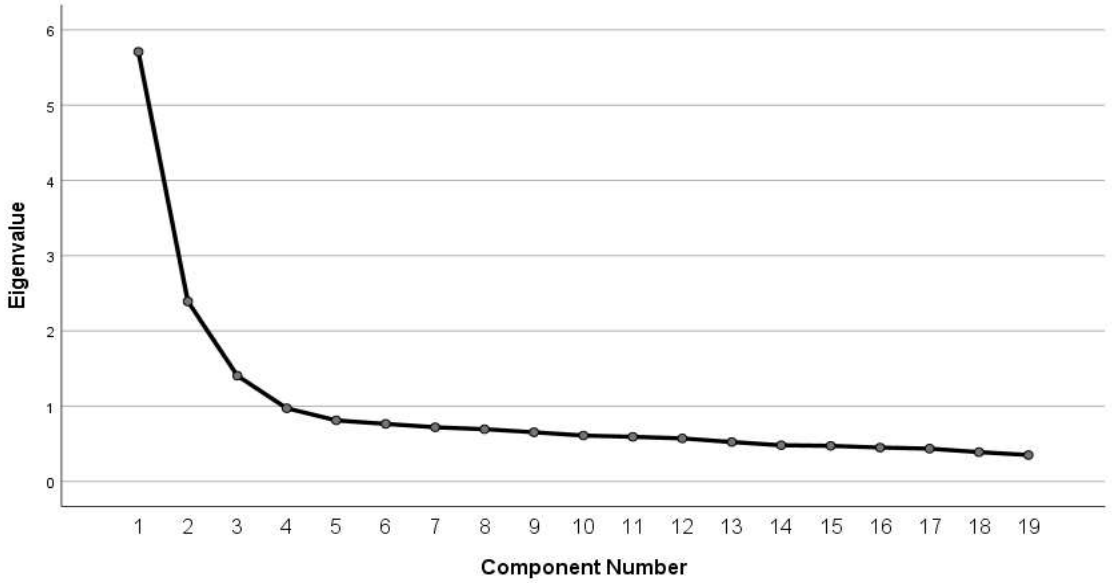

Figure 1. Scree Plot of the Scale

Table 3. Rotated Component Matrix of Scale

Questions	Component		
	F1	F2	F3
14. Health services are worsening the health of society rather than improving it.	.748		
10. Medical institutions have become a great danger to public health.	.723		
13. Health systems have a negative impact on the health culture of society, making people dependent.	.708		
11. Health services and pharmaceutical companies have a negative impact on public health.	.696		
19. Medicine, as a social condition, always creates disease.	.655		
12. The budgets spent by the state on health services contribute to practices that do not provide real benefits to the public.	.646		
15. Health policies increase social inequalities.	.586		
21. When I get sick, going to the hospital does not reduce my pain.	.509		
27. Health care reduces cultural diversity by suppressing traditional medical practices.		.747	
25. Medicine is destroying cultural traditions related to health.		.742	
23. Medicine eliminates traditional coping methods.		.664	
26. Medicine applies a universal standard without considering cultural differences.		.595	
28. Medicine rejects treatments that are appropriate to individuals' own cultures.		.543	
24. Medicine reduces the ability of individuals to cope with their own health problems.		.533	
5. Medical errors worsen the health status of patients.			.734
9. Disabilities occur as a result of unnecessary surgical and medical interventions.			.708
8. Medical treatment in hospitals is useless.			.687
7. Costs in health care limit patients' access to treatment.			.640
1. Medical interventions, misdiagnosis and treatments have negative effects on health status.			.621

The factor loadings presented in Table 3 demonstrate that all retained items loaded significantly onto their respective factors, with values exceeding the commonly accepted threshold of 0.50. This indicates strong item–factor relationships and supports the construct validity of the scale. Items loading on the first factor represent the social iatrogenesis dimension, reflecting individuals' perceptions of the negative structural and systemic impacts

of healthcare services and policies. The second factor corresponds to cultural iatrogenesis, encompassing the influence of medical practices on traditional health beliefs and cultural values. The third factor represents clinical iatrogenesis, focusing on the direct negative effects of medical interventions, such as medical errors, unnecessary treatments, and adverse outcomes. This factor structure is consistent with Ivan Illich's theoretical framework and supports the multidimensional nature of the iatrogenesis construct. In addition, the total variance explained by the three-factor structure was approximately 50%, which may be considered moderate. However, in the context of multidimensional scale development, particularly in social sciences, variance explained between 40% and 60% is generally regarded as acceptable. Therefore, the variance level obtained in this study can be considered sufficient to support the factorial structure of the scale. This result may be attributed to the complex and multifaceted nature of the iatrogenesis construct, which encompasses clinical, social, and cultural dimensions.

An examination of Tables 2 and 3 revealed that the Kaiser–Meyer–Olkin value for the Iatrogenesis Perception Scale was 0.899 and that Bartlett's Test of Sphericity was statistically significant ($p < .05$), indicating that both the sample size and inter-item correlations were appropriate for factor analysis. The results of the exploratory factor analysis demonstrated that the scale exhibited a three-factor structure.

Analysis of factor loadings showed that items 10, 11, 12, 13, 14, 15, 19, and 21 formed the social iatrogenesis subdimension, accounting for 30.042% of the explained variance. Items 23, 24, 25, 26, 27, and 28 loaded on the cultural iatrogenesis subdimension with an explained variance of 12.588%, while items 1, 5, 7, 8, and 9 constituted the clinical iatrogenesis dimension, explaining 7.392% of the variance. Overall, the three-factor model explained 50.022% of the total variance of the scale. To further validate the factor structure identified through EFA, CFA was subsequently performed.

CFA assesses the degree of model–data fit by estimating predefined factor loadings, error variances, and the relationships among latent factors (Yaşlıoğlu, 2017). Accordingly, construct validity in the present study was evaluated by examining commonly reported CFA fit indices, including χ^2/df, GFI, AGFI, CFI, NFI, RMSEA, and RMR. The CFA path diagram of the scale and the corresponding fit index values are presented below.

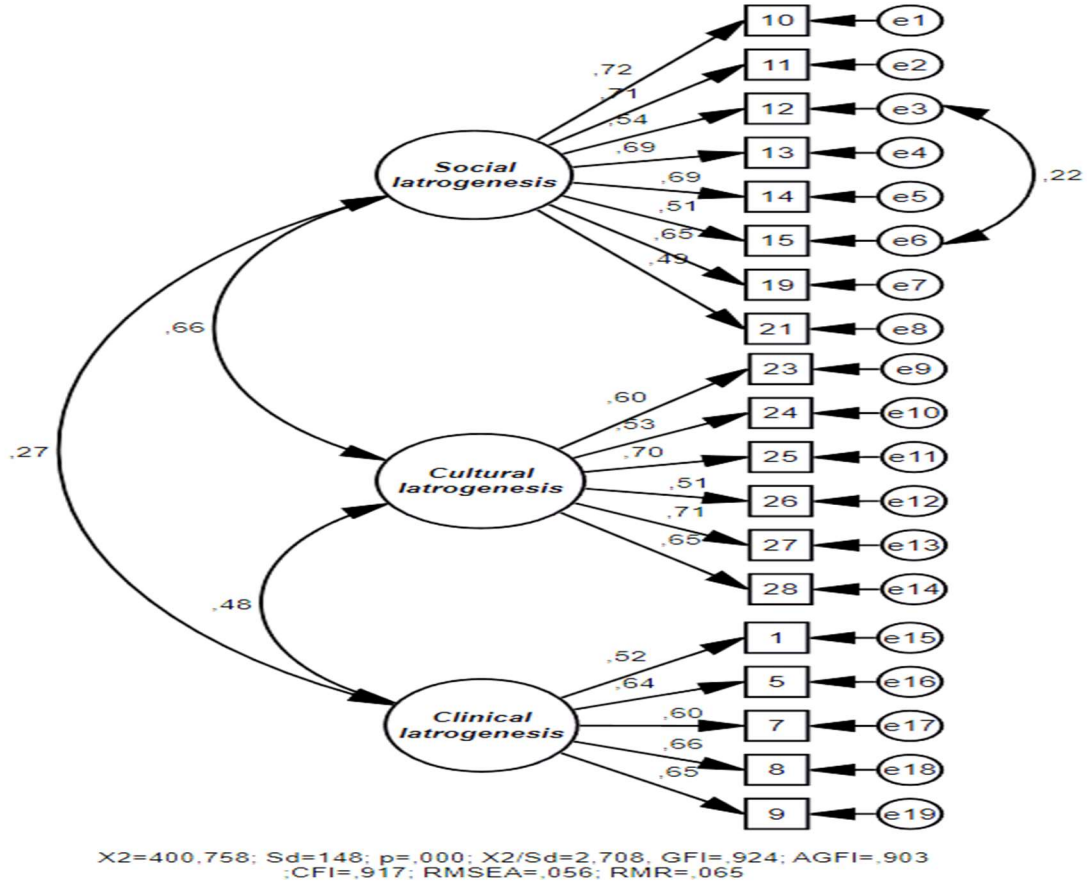

Figure 2. Path Diagram of the Scale

Figure 2 illustrates the CFA path analysis results for the Iatrogenesis Scale. The standardized factor loadings of the items were found to range between 0.52 and 0.72. Factor loadings exceeding 0.32 are generally regarded as acceptable and indicate adequate item–factor relationships (Çokluk et al., 2012; Özdamar, 2017). Based on these criteria, no items were excluded from the model. To improve the model fit, a covariance was specified between items 12 and 15. This modification was not made solely on statistical grounds, but was supported by both the modification indices obtained from the CFA output and the theoretical relationship between the two items (Meydan & Şeşen, 2015; Şimşek, 2007; Wang & Wang, 2019). Specifically, item 12 focuses on the allocation of public resources in healthcare, while item 15 relates to the broader impact of health policies on social inequality. Since both items address closely related structural and policy-level aspects of the healthcare system, their conceptual overlap

suggests that respondents may perceive them as interrelated. Therefore, the inclusion of a covariance between their error terms was considered both statistically and theoretically justified.

As shown in Table 4, the goodness-of-fit indices of the Iatrogenesis Perception Scale were found to indicate an acceptable level of model fit in accordance with the threshold values reported in the literature (Hooper et al., 2008; Meydan & Şeşen, 2015; Munro, 2005; Rose et al., 2004; Şimşek, 2007; Wang & Wang, 2019)

Table 4. CFA Results of the Scale Fit Indices

Compliance Indices	Good Fit	Acceptable Compliance	Model Values
X^2/Sd	<2	<5	2.708
GFI	>0.95	>0.90	0.924
AGFI	>0.95	>0.90	0.903
CFI	>0.95	>0.90	0.917
RMSEA	<0.05	<0.08	0.056
RMR	<0.05	<0.08	0.065

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Table 5. Convergent and Discriminant Validity Results of the Iatrogenesis Perception Scale

Constructs	CR	AVE	1	2	3
1. Social Iatrogenesis	0.86	0.44	0.66		
2. Cultural Iatrogenesis	0.82	0.43	0.53	0.66	
3. Clinical Iatrogenesis	0.77	0.40	0.25	0.40	0.63

Note: *Diagonal values (bold) represent the square root of AVE. Off-diagonal values represent inter-construct correlations.*

Table 5 presents the results of convergent and discriminant validity analyses for the Iatrogenesis Perception Scale. Convergent validity was assessed using Composite Reliability (CR) and Average Variance Extracted (AVE). The CR values ranged between 0.77 and 0.86, exceeding the recommended threshold of 0.70, indicating satisfactory internal consistency across all constructs. Although AVE values ranged between 0.40 and 0.44 and remained slightly below the suggested threshold of 0.50, this can be considered acceptable in exploratory and multidimensional scale development studies when CR values are adequate. Discriminant validity was evaluated using the Fornell–Larcker criterion. The square root of AVE values (presented on the diagonal) were greater than the correlations between constructs, indicating that each construct is empirically distinct from the others. In addition, the inter-construct correlations were below critical thresholds, further supporting discriminant validity. Overall, these findings demonstrate that the Iatrogenesis Perception Scale has acceptable convergent validity and satisfactory discriminant validity, supporting the construct validity of the scale.

According to Tabachnick and Fidell (2013), skewness and kurtosis values falling within the range of −1.5 to +1.5 suggest that the data approximate a normal distribution. Moreover, Cronbach's alpha coefficients between 0.60 and 0.79 are considered indicative of acceptable reliability, while values between 0.80 and 1.00 reflect high internal consistency in Likert-type scales (Kalaycı, 2017; Munro, 2005; Uzunsakal & Yıldız, 2018). The results of the reliability and normality analyses for the scale and its subdimensions are presented in Table 6.

Table 6. Normality and Reliability Analysis Values of the Iatrogenesis Perception Scale And Its Sub-Dimensions

Scale and Dimensions	Number of Articles	Mean±Sd	Skewness	Kurtosis	Cronbach Alpha
Iatrogenesis Perception	19	2.93±0.55	0.140	1.346	0.862
Social iatrogenesis	8	2.41±0.66	0.490	1.485	0.835
Cultural iatrogenesis	6	2.88±0.71	0.090	0.710	0.785
Clinical iatrogenesis	5	3.83±0.77	-0.809	0.581	0.747
Distrust of the Health System	10	2,91±0,52	-0,194	-1,489	0,638

An examination of Table 6 shows that the skewness and kurtosis values of the overall scale and its subdimensions fall within the range of −1.5 to +1.5, indicating that the data do not deviate from a normal distribution. Given the relatively large sample size (n = 539), the assumption of normality becomes less critical due to the central limit theorem, which suggests that parametric analyses remain robust even when minor deviations from normality are present. Furthermore, the Cronbach's alpha coefficients calculated for the scale and its subdimensions range between 0.60 and 1.00, indicating that the scale demonstrates acceptable to high reliability, although some

subdimensions exhibit relatively limited internal consistency overall scale score and its subdimensions.

Table 7. Correlation Analysis Findings Between Iatrogenesis Perception Scale and Its Sub-Dimensions

Scale and Dimensions	Iatrogenesis Perception	Social iatrogenesis	Cultural iatrogenesis	Clinical iatrogenesis	Distrust of the Health System
Iatrogenesis Perception	1				
Social iatrogenesis	.819*	1			
Cultural iatrogenesis	.828*	.530*	1		
Clinical iatrogenesis	.661*	.248*	.402*	1	
Distrust of the Health System	.636*	.494*	.542*	.440*	1

** $p < 0.001$*

The findings indicated that all associations between the total iatrogenesis perception score and its subdimensions were statistically significant ($p < 0.001$). Moreover, strong positive correlations were observed between the subdimensions and overall iatrogenesis perception. In addition, to assess the contextual validity of the Iatrogenesis Perception Scale, Pearson correlation analysis was performed with the Health System Distrust Scale. The results revealed a significant positive relationship between the two constructs ($p < 0.001$), indicating that higher levels of distrust in the health system are associated with increased perceptions of iatrogenesis.

Discussion

The findings of this study demonstrate that the Iatrogenesis Perception Scale has a multidimensional structure consisting of clinical, social, and cultural components, consistent with Illich's theoretical framework. The identification of these three distinct dimensions suggests that individuals do not perceive iatrogenesis as a purely clinical phenomenon, but rather as a complex construct shaped by systemic, cultural, and experiential factors. This result is important because it highlights that perceptions of medical harm extend beyond direct clinical outcomes and are also influenced by broader social structures and cultural transformations. In particular, the strong representation of the social and cultural dimensions indicates that individuals critically evaluate not only medical interventions but also the institutional and societal context in which healthcare is delivered. This finding aligns with contemporary perspectives in medical sociology, which emphasize the role of healthcare systems, power relations, and medicalization processes in shaping health perceptions. Furthermore, the acceptable model fit indices obtained from the CFA support the structural validity of the scale, indicating that the proposed theoretical framework is empirically supported. This suggests that Illich's conceptualization of iatrogenesis remains relevant in contemporary healthcare contexts, but also gains additional explanatory power when interpreted through modern frameworks such as patient safety and healthcare trust.

Although the overall reliability of the scale was found to be satisfactory, it is important to note that some subdimensions yielded Cronbach's alpha values around 0.60. These values should not be interpreted as high reliability; rather, they indicate a level of internal consistency that is acceptable but relatively limited. In the context of newly developed scales and exploratory research, alpha coefficients at this level may be considered acceptable, particularly when the construct being measured is complex and multidimensional. However, these findings also suggest that certain subdimensions may require further refinement. Given that the concept of iatrogenesis encompasses clinical, social, and cultural dimensions, achieving uniformly high internal consistency across all subdimensions may be inherently challenging. Therefore, while the reliability levels can be considered acceptable for an initial scale development study, future research is recommended to improve the internal consistency of the scale by revising items and testing the structure across different samples. This finding also reflects the inherent complexity of measuring perceptions related to healthcare systems, where individuals' experiences, beliefs, and expectations may vary considerably.

Given that the concept of iatrogenesis encompasses clinical, social, and cultural dimensions, achieving very high internal consistency across all subdimensions may be inherently challenging. Therefore, these findings can be interpreted as acceptable within the early stages of scale development. Nevertheless, future studies are recommended to further refine the scale and improve the internal consistency of these subdimensions by testing the instrument across different samples and contexts.

Comparisons in different studies in the literature are noteworthy, especially in terms of the effectiveness of psychological intervention programs. For example, the advantages of diagnosis-specific psychological intervention programs in the treatment of various anxiety and depression disorders are evident when compared to current medical practices (İngeç & Yorulmaz, 2021). In addition, the effects of mindfulness-based stress reduction programs on improving patients' quality of life significantly influence how individuals perceive medical interventions (Ataç, 2021). The perception of such programs as a complementary element to traditional medical approaches contributes to reshaping the perception of medical interventions in society. At the same time, a comprehensive examination of the perception of iatrogenesis shows that medical interventions are not

limited to their effects on individuals but also have repercussions at the societal level (Castiel & Álvarez-Dardet, 2007). This impact is reflected in individuals' use of healthcare services and their attitudes toward medical practices. Illich's critiques suggest that individuals should increase their say over their own health in the face of medicine's dominant power (Babich, 2018; O'Mahony, 2016). In this context, the study's findings emphasize that individuals' perceptions of negative medical outcomes may lead them to approach interventions more critically.

The clinical iatrogenesis subscale, with high factor loadings and acceptable internal consistency, has been shown to be effective in measuring the adverse effects of medical errors and side effects on patients. These findings are consistent with those of Moutaouakkil et al. (2017), which highlight the adverse effects of drug side effects, misdiagnoses, and unnecessary surgical procedures. Similarly, Biley (2010), supported Illich's concept of clinical iatrogenesis by suggesting that modern medicine can sometimes worsen health problems rather than alleviate them. Contentti et al. (2023) highlighted the risks of misdiagnosing conditions such as neuromyelitis optica spectrum disorder, noting that misdiagnoses can lead to inappropriate treatments and, as a result, worsen patients' symptoms. These findings are further supported by those of Molnár et al. (2020). Their research highlights the need for reliable assessment tools in evaluating iatrogenesis by demonstrating how overreliance on technology without adequate clinician oversight can contribute to harmful clinical decisions.

The social iatrogenesis sub-dimension assesses the structural and systemic effects of the healthcare system on society. Illich (2019), emphasizes that social iatrogenesis stems not only from medical practices but also from government policies and the pharmaceutical industry's directives. The findings obtained in this context are consistent with Barnet's (2003) view that the industrialization of healthcare services distances individuals from self-care skills and makes them dependent on the healthcare system. Durmuş İskender et al. (2023) support the research findings that the industrialization of healthcare services distances individuals from self-care skills and makes them dependent on the healthcare system. In particular, the commercialization of healthcare services reduces individuals' control over their own health, which leads to an increase in social iatrogenesis. Köseoğlu and Enç (2016) found that individuals who lack adequate health knowledge exhibit greater medication non-adherence. This situation stems from individuals' inability to understand medication management and health processes, thereby increasing their dependence on the healthcare system.

The cultural iatrogenesis sub-dimension measures the tendency of modern medicine to suppress traditional treatment methods and reduce cultural diversity. Lupton (2005) argues that medicine's universalist approach disregards cultural differences and that this can lead to cultural alienation in individuals. Additionally, Gönç Şavran (2013), notes that modern medicine medicalizes life cycle rituals such as birth, illness, and death, thereby weakening individuals' capacity to cope with these natural processes. These findings support Illich's (1975) thesis that "medicine destroys people's methods of coping with pain" in relation to cultural iatrogenesis. A study by Kılıç and Soylar (2019) observed that in situations where traditional and complementary medicine practices are on the rise, "individuals with chronic illnesses turn to alternative treatment methods due to the inadequacy of modern medicine." This shows that when individuals cannot find adequate health services, they turn to their cultural ties and traditional practices in an effort to manage their own health. Therefore, health systems dominated by modern medicine hinder individuals from seeking solutions appropriate to their current circumstances, thereby reinforcing cultural iatrogenesis.

Pearson correlation analysis conducted with the health system distrust scale to ensure the contextual validity of the iatrogenic scale shows that as levels of distrust in the health system increase, so does the perception of iatrogenesis. The results indicate a positive relationship ($p<.001$). This demonstrates that individuals' distrust of the healthcare system has a significant effect on their perception of iatrogenesis. The findings of Cockroft et al. (2020) provide context for how demographic characteristics can influence both trust and perceptions of iatrogenesis, revealing that "increasing age is statistically significantly correlated with distrust in the US healthcare system." This supports the idea that an individual's history and experiences with healthcare services can shape their overall trust and, consequently, influence their views on potential harms associated with medical interventions. Çankaya and Filiz (2024) state that as distrust in the healthcare system increases, so does iatrogenesis perception. This situation causes individuals to become more sensitive to medical errors as their trust in healthcare services weakens. Iatrogenesis perception may result in individuals being exposed to greater health risks due to their lack of trust in modern medicine. Diğer and Ardıç (2023) state that concerns about the adequacy of the healthcare system can lead individuals to make negative assessments about treatment processes. Based on this information, distrust in the healthcare system is an important factor in how individuals perceive medical interventions and healthcare services.

Overall, this study on the validity and reliability of the "Iatrogenesis Perception Scale" invites us to question medical interventions both in terms of clinical applications and their social dimensions. The findings shed light on the broad impact of medical practices on society while creating a unique psycho-social approach and integrating existing knowledge in the relevant literature.

Limitations of the study

This study has several limitations that should be considered when interpreting the findings. First, the sample was limited to adults living in Turkey and was obtained using a convenience sampling method. This may restrict the generalizability of the findings to the broader population. In particular, the sample predominantly consisted of young individuals, with a large proportion aged between 18–24, and a high level of educational attainment, as most participants held a university degree. This demographic concentration may limit the applicability of the results to populations with different age groups, educational levels, and socio-cultural backgrounds. This limitation is particularly important for the social iatrogenesis dimension, which reflects broader societal and policy-level perceptions that may differ

significantly across diverse demographic groups. Second, although the construct validity of the scale was supported through Exploratory and Confirmatory Factor Analyses, some subdimensions yielded Cronbach's alpha values around 0.60. While this level is considered acceptable in the early stages of scale development, it indicates that the internal consistency of certain subdimensions may be relatively limited. Therefore, further studies are needed to improve the reliability of the scale and to confirm its psychometric properties in different samples. Third, the data were collected using self-report measures, which may introduce potential biases such as social desirability and response bias. Participants may have responded in a manner they perceived as socially acceptable rather than reflecting their true perceptions. Finally, the scale was developed within a specific cultural context, and this may affect its applicability in different cultural or healthcare system settings. Future research is recommended to test the validity and reliability of the scale across more diverse and heterogeneous populations and to examine its cross-cultural adaptability. Therefore, caution should be exercised when generalizing the findings, especially with regard to macro-level interpretations such as social iatrogenesis.

Conclusion

While rapid change and development in the field of health has led to advances in treatment and diagnostic methods, it has also led to unintended health consequences, which we call iatrogenesis. Iatrogenesis is a concept that describes the unexpected effects caused by medical interventions, and improving understanding of this phenomenon is critical to making health systems safer and more effective.

This research addresses the process of developing a scale to more deeply understand and measure the concept of iatrogenesis as articulated by Ivan Illich (2019). Understanding iatrogenic effects is an important issue for healthcare professionals, researchers and policy makers. This scale will be a tool that can be used to identify, analyze and mitigate iatrogenic risks in healthcare.

EFA was employed to assess the statistical construct validity of the scale. Based on the EFA results, nine items with item–total correlation coefficients of 0.50 or below were excluded, and the remaining items were found to demonstrate satisfactory item–total correlations. The KMO value was calculated as 0.899, and Bartlett's Test of Sphericity was statistically significant ($p < 0.05$), indicating that the sample size and inter-item correlations were appropriate for factor analysis.

The EFA results revealed a three-factor structure, with the scale explaining 50.022% of the total variance. To further support the factor structure obtained through EFA, CFA was conducted, and the resulting fit indices were found to be within acceptable ranges according to the literature.

Reliability analysis was performed using Cronbach's alpha coefficients. The alpha values obtained for the Iatrogenesis Perception Scale and its subdimensions ranged between 0.60 and 1.00, indicating acceptable to high internal consistency. In addition, all relationships between the overall scale score and its subdimensions were statistically significant and positively correlated. In addition, Pearson correlation analysis was performed between the scale of distrust in the health system in order to make the context validity of the iatrogenesis scale and a positive relationship was determined. As distrust in the health system increases, the perception of iatrogenesis also increases.

As a result of the research, this scale, which consists of 19 items and 3 dimensions, can be used in researches to determine the perception of iatrogenesis perception scale to determine the perception of unintentional or emerging situations during treatment or diagnostic procedures.

Consent for publication

Not applicable.

Availability of data and materials

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Competing interests

The authors declare that they have no competing interests.

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Authors' contributions

The conception, design, material preparation, data collection and analysis were carried out by AG. The first draft of the article was written and revised by AG. The author has read and approved the final version of the article.

Ethical Statement

This study was conducted in accordance with the principles of scientific research and publication ethics and the ethical principles outlined in the Declaration of Helsinki. Participation in the study was entirely voluntary. All participants were informed about the purpose of the study prior to participation, and informed consent was obtained electronically through the consent statement presented at the beginning of the online questionnaire. No personally identifiable information was collected, and the data were used solely for scientific research purposes.

Ethics Committee Permission

Ethical approval for this study was obtained from the Hatay Mustafa Kemal University Social and Human Sciences Scientific Research and Publication Ethics Committee (Meeting Date: January 2, 2024; Meeting No: 01; Decision No: 16).

Artificial Intelligence Usage Statement

Generative artificial intelligence tools were used solely for language editing and improving the clarity and readability of the manuscript. Artificial intelligence was not used for data collection, data analysis, interpretation of the findings, or generation of the scientific conclusions. The author reviewed and verified the entire manuscript and takes full responsibility for its conten

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