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THE ROLE OF TRADITIONAL, COMPLEMENTARY AND INTEGRATIVE MEDICINE PRACTICES IN GLOBAL HEALTH SYSTEMS: AN ECOLOGICAL ANALYSIS

GELENEKSEL, TAMAMLAYICI VE BÜTÜNLEYİCİ TIP UYGULAMALARININ KÜRESEL SAĞLIK SİSTEMLERİNDEKİ YERİ: EKOLOJİK BİR ANALİZ

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Abstract
This study aims to examine the structural characteristics of Traditional, Complementary and Integrative Medicine (TCIM) systems within global health systems and their association with socioeconomic indicators. Designed as an ecological study, the research evaluates TCIM indicators from 103 countries based on data obtained from the WHO TCIM Dashboard. Key variables include the presence of national legislation on TCIM, responsible national bodies, university-level education, national research institutes, and payment systems. Their associations with health expenditure per capita and the Human Development Index (HDI) were analysed. Data were analysed using SPSS v25.0; Mann-Whitney U and Kruskal-Wallis tests were used for group comparisons, while the chi-square test was applied to categorical variables. The findings revealed significant structural differences in TCIM systems across countries. Countries with national TCIM legislation had significantly higher HDI scores (p=0.027), and HDI was also higher in countries with national research institutes (p=0.008). Significant regional differences were observed in the distribution of TCIM structural indicators across WHO regions. In conclusion, the level of institutionalization of TCIM systems appears to be associated with countries' development indicators, and integration into health systems is not equally distributed globally.

Keywords: Health Policies, Human Development Index, Regional Analysis, TCIM

Öz
Bu çalışmanın amacı, küresel sağlık sistemleri içindeki Geleneksel, Tamamlayıcı ve Bütünleyici Tıp (TCIM) sistemlerinin yapısal özelliklerini ve sosyoekonomik göstergelerle ilişkilerini incelemektir. Ekolojik bir çalışma olarak tasarlanan araştırma, DSÖ TCIM Gösterge Tablosundan elde edilen verilere dayanarak 103 ülkeden TCIM göstergelerini değerlendirmektedir. Temel değişkenler arasında TCIM ile ilgili ulusal mevzuatın varlığı, sorumlu ulusal kurumlar, üniversite düzeyinde eğitim, ulusal araştırma enstitüleri ve ödeme sistemleri yer almaktadır. Kişi başına sağlık harcaması ve İnsani Gelişme Endeksi (HDI) ile ilişkileri analiz edilmiştir. Veriler SPSS v25.0 kullanılarak analiz edilmiştir; grup karşılaştırmaları için Mann-Whitney U ve Kruskal-Wallis testleri kullanılırken, kategorik değişkenlere ki-kare testi uygulanmıştır. Bulgular, ülkeler arasında TCIM sistemlerinde önemli yapısal farklılıklar olduğunu ortaya koymuştur. Ulusal TCIM mevzuatına sahip ülkelerin önemli ölçüde daha yüksek HDI puanları vardı (p=0,027) ve ulusal araştırma enstitülerine sahip ülkelerde de HDI daha yüksekti (p=0,008). TCIM yapısal göstergelerinin DSÖ bölgeleri genelindeki dağılımında önemli bölgesel farklılıklar gözlemlenmiştir. Sonuç olarak, TCIM sistemlerinin kurumsallaşma düzeyi, ülkelerin kalkınma göstergeleriyle ilişkili görünmektedir ve sağlık sistemlerine entegrasyon küresel olarak eşit bir şekilde dağılmamıştır.

Anahtar Kelimeler: Sağlık Politikaları, İnsani Gelişme Endeksi, Bölgesel Analiz, TCIM

1. Introduction

Traditional medicine has played a central role in human health and well-being across cultures and countries for centuries. Traditional, Complementary and Integrative Medicine (TCIM) encompasses practices used by billions of people worldwide as a primary means of healthcare or as a preferred option for health and wellness (WHO, 2025). In recent years, the global rise in chronic diseases, along with shifts in individual preferences and expectations regarding healthcare, has led to increased interest in TCIM practices. In response to this growing interest, many countries have begun to develop policies aimed at defining, regulating, and integrating TCIM into their national healthcare systems (Deniz, Sevimli, &Ünlü, 2021).

The institutional structure of TCIM systems in countries comprises multiple dimensions, including legal regulations, educational opportunities, research infrastructure, and financing models. These components play a critical role not only in the prevalence and acceptance of TCIM, but also in the quality, accessibility, and sustainability of the services provided. However, these structural elements are not equally developed across all countries, and regional differences as well as socioeconomic factors appear to play a significant role in shaping this landscape (Raja, Cramer, Lee, Wieland, & Ng, 2024).

The World Health Organization (WHO) has had a traditional medicine program since 1975, and a Traditional, Complementary and Integrative Medicine Unit is established at WHO headquarters (WHO, 2025). WHO published global strategy documents for the period 2014–2023 to guide policy-making processes in the field, aiming to promote the safer and more effective implementation of TCIM at the national level (WHO, 2013).

Despite these efforts, there is a lack of comparative analyses on the extent to which TCIM systems have been institutionalized in different countries and how this institutionalization is associated with specific health system or socioeconomic indicators. In this context, the aim of our study is to evaluate, at an ecological level, the relationship between key structural indicators of TCIM practices (such as legal regulation, national policy body, education and research infrastructure, and financing system) and macro-level indicators like national health expenditures and the Human Development Index (HDI), using the most recent and accessible data from 103 countries. Additionally, the study aims to analyse regional differences in the distribution of TCIM systems based on WHO regions.

2. Material and Methods

This study is a descriptive, ecological analysis examining the relationship between TCIM systems and global health systems. The data were obtained from the WHO Traditional, Complementary and Integrative Medicine dashboard, which includes 2023 data published on the Microsoft Power BI platform. It includes up-to-date TCIM system data provided by the WHO as part of its free and open-access information resources (WHO, 2023).

The following TCIM system indicators from 103 countries were evaluated in the study:

- Presence of national legislation for TCIM practices
- Existence of a national authority/body responsible for TCIM policies
- Availability of TCIM education at the university level
- Presence of a national research institute in the field of TCIM
- Payment system for TCIM services (public insurance, private insurance, out-of-pocket payments)
- Regional distribution (based on WHO regions)

In addition, countries' socioeconomic indicators (HDI and per capita health expenditure in USD) were obtained from the 2023 databases of the United Nations Development Programme (UNDP) and the World Bank (Group, 2025; Reports, 2025).

The Human Development Index (HDI) is a composite indicator developed by the United Nations Development Programme (UNDP) to assess a country's overall human development. It combines indicators of life expectancy at birth, mean years of schooling, expected years of schooling, and gross national income per capita. Higher HDI values indicate better average achievements in human development dimensions (UNDP, 2023).

Per capita health expenditure refers to the average amount spent on healthcare services per person in a given country, expressed in current US dollars. It includes public and private health expenditure and serves as an important proxy for a country's investment in health systems and access to care (World Bank, 2023).

Data analysis was performed using SPSS version 25.0 software. Descriptive statistics were presented as counts and percentages. The distribution of continuous variables was assessed using the Kolmogorov-Smirnov test. For data that did not show a normal distribution, the Mann-Whitney U test was used, and differences among three or more groups were analysed with the Kruskal-Wallis test. For categorical variables, frequencies and percentages were calculated, and the Chi-square test was applied to evaluate differences between groups. A significance level of $p < 0.05$ was accepted.

3. Results and Discussion

National legislation for TCIM practices exists in 62.1% of the countries, a national authority/body responsible for TCIM policies in 63.1%, and

university-level TCIM education in 46.6%. The proportion of countries with a national research institute for TCIM is 41.7%. The most common payment method for services is out-of-pocket payment (57.4%), followed by public insurance coverage (28.2%) and private insurance coverage (4.8%) (Table 1).

Table 1. Distribution of traditional, complementary and integrative medicine system indicators by country

		n	%
WHO Region	African Region	28	27.2
	Region of the Americas	16	15.5
	Eastern Mediterranean Region	15	14.6
	European Region	19	18.4
	South-East Asia Region	11	10.7
	Western Pacific Region	14	13.6
National legislation for TCIM	Yes	64	62.1
	No	39	37.9
National authority/body responsible for TCIM policies	Yes	65	63.1
	No	38	36.9
University-level education in TCIM	Yes	48	46.6
	No	55	53.4
National research institute for TCIM	Yes	43	41.7
	No	60	58.3
What payment system is used for TCIM services?	Public insurance	29	28.2
	Private insurance	5	4.8
	Out-of-pocket	59	57.3
	Data not available	10	9.7

TCIM = Traditional, Complementary and Integrative Medicine

These results indicate that although many countries have taken steps to institutionalize TCIM through legislation and regulatory bodies, significant disparities remain in education, research, and financial coverage. The relatively low prevalence of university-level training and research institutes reflects ongoing challenges in standardization and scientific validation of TCIM practices (WHO, 2019; Raja et al., 2024). Additionally, the high reliance on out-of-pocket payments may create financial barriers and exacerbate health inequities, especially in low-resource settings (Sirag & Mohamed Nor, 2021).

Table 2. Average per capita health expenditure by traditional, complementary and integrative medicine structural components

TCIM Structural Component	Status	Mean ± SD	Median	Min–Max (USD)	p-value
National legislation for TCIM	Yes	1234.3 ± 2132.7	369.9	15.3 – 8692.6	0.277
	No	985.8 ± 2215.5	237.8	16.3 – 12434.4	
National authority/body for TCIM policies	Yes	1208.8 ± 2113.4	369.9	15.3 – 8692.6	0.220
	No	1022 ± 2253.4	203.8	15.3 – 12434.4	
University-level education in TCIM	Yes	1249.6 ± 2212.8	369.9	15.3 – 8692.6	0.724
	No	1044 ± 2122.9	283.9	15.6 – 12434.4	
National research institute for TCIM	Yes	1237 ± 2208.4	369.9	15.3 – 8692.6	0.342
	No	1070.1 ± 2135.4	281.1	15.4 – 12434.4	
Payment system for TCIM services	Public insurance	1174.2 ± 2044.9	369.9	15.3 – 6432.4	0.605
	Private insurance	1153.6 ± 1357.8	369.9	154.5 – 3352.8	
	Out-of-pocket	1140.8 ± 2340.8	278.4	15.3 – 12434.4	

TCIM = Traditional, Complementary and Integrative Medicine, SD = Standard Deviation, Min = Minimum, Max = Maximum

In line with this, the limited coverage of TCIM services by public insurance reported at only 28.2% further highlights the lack of full integration into national health systems, posing challenges for equitable access (Biçer & Balçık, 2019). The lack of coherent integration pathways, insufficient regulatory oversight, and weak health information systems were cited as key barriers to mainstreaming TCIM services into public health frameworks (Peltzer & Pengpid, 2018). These findings align with previous literature suggesting that while TCIM has gained recognition, further efforts are needed to ensure its safe, evidence-based, and equitable integration into health care systems (von Schoen-Angerer et al., 2023). The recent establishment of the WHO Global Centre for Traditional Medicine and the 2023 Traditional Medicine Global Summit demonstrate growing institutional commitment to advancing TCIM integration on a global scale (Patwardhan, Wieland, Aginam, Chuthaputti, Ghelman, Ghods, et al., 2023). No statistically significant difference was found in the average per capita current health expenditure according to the presence of structural TCIM elements. Average per capita health expenditures according to TCIM structural elements are shown in Table 2. This result indicates that the presence of TCIM-related structures may not be directly associated with higher per capita health expenditure. HDI was 0.74 ± 0.15 in countries with national legislation for TCIM and 0.67 ± 0.16 in countries without it (p = 0.027). Countries with a national authority responsible for TCIM policies had an HDI of 0.74 ± 0.14, compared to 0.66 ± 0.17 in countries without such authority (p = 0.027). The HDI was 0.77 ± 0.14 in countries with a national research institute for TCIM and 0.68 ± 0.16 in countries without one (p = 0.008) (Table 3).

Table 3. Human development index values by traditional, complementary and integrative medicine structural components

TCIM Structural Component	Status	Mean ± SD	Median	Min–Max	p-value
National legislation for TCIM	Yes	0.74 ± 0.15	0.74	0.36 – 0.97	**0.027**
	No	0.67 ± 0.16	0.69	0.39 – 0.93	
National authority/body for TCIM policies	Yes	0.74 ± 0.14	0.73	0.42 – 0.97	**0.027**
	No	0.66 ± 0.17	0.69	0.36 – 0.93	
University-level education in TCIM	Yes	0.73 ± 0.16	0.74	0.39 – 0.97	0.351
	No	0.70 ± 0.16	0.73	0.36 – 0.96	
National research institute for TCIM	Yes	0.77 ± 0.14	0.77	0.39 – 0.97	0.008
	No	0.68 ± 0.16	0.70	0.36 – 0.96	
Payment system for TICM services	Public insurance	0.74 ± 0.16	0.74	0.45 – 0.96	0.313
	Private insurance	0.80 ± 0.09	0.80	0.67 – 0.92	
	Out-of-pocket	0.70 ± 0.16	0.72	0.36 – 0.97	

TCIM = Traditional, Complementary and Integrative Medicine, SD = Standard Deviation, Min = Minimum, Max = Maximum

Globally, patients utilize traditional, complementary, and integrative medicine (TCIM) services for various reasons. Especially in the Global South, traditional medicine often constitutes the most geographically and/or financially accessible form of healthcare; this remains true even though patients may prefer biomedical services (Keshet & Simchai, 2014). The presence of national legal regulations for TCIM practices is more common in countries with higher HDI levels, indicating that the socioeconomic and administrative capacities of these countries are also
reflected in the field of traditional and complementary medicine. Among the components of HDI, life expectancy, education level, and income per capita are indicators that directly influence both the scope and effectiveness of health policies and public health regulations. A high level of education and access to information can increase public awareness of alternative health approaches, while a strong economic structure enables the provision of necessary resources for the regulation and supervision of these services (UNDP, 2023). In this context, the greater prevalence of legal regulations related to TCIM in countries with high HDI suggests that the level of development is supported by institutional policies that encompass a holistic approach to public health.

HDI in countries with national research institutes for TCIM indicates that the scientific infrastructure and knowledge production also extend to the field of traditional medicine. Further transdisciplinary research, appropriate funding, and international standards are necessary to ensure safe, evidence-

based integration of TCIM into modern health systems (Patwardhan, Wieland, Aginam, Chuthaputti, Ghelman, Ghods, et al., 2023). The presence of research and development activities allows for the evaluation of these practices not only in terms of service delivery but also regarding their efficacy, safety, and cost-effectiveness. This situation shows that developed countries lead in grounding traditional and complementary medicine services on scientific evidence. However, although TCIM research is increasing worldwide, this growth does not directly parallel the rates of service utilization. Therefore, it is reported that TCIM research should be given greater priority and funding within national research policies and programs (von Schoen-Angerer et al., 2023).

Table 4. Distribution of traditional, complementary and integrative medicine system indicators by world health organization regions

TCIM Indicator	African Region	Region of the Americas	Eastern Mediterranean Region	European Region	South-East Asia Region	Western Pacific Region
National legislation for TCIM						
Yes	22 (34.4%)	11 (17.2%)	7 (10.9%)	7 (10.9%)	9 (14.1%)	8 (57.1%)
No	6 (15.4%)	5 (12.8%)	8 (20.5%)	12 (30.8%)	2 (5.1%)	6 (42.9%)
p	**0,033**					
National authority/body for TCIM policies						
Yes	22 (33.8%)	11 (16.9%)	7 (10.8%)	7 (10.8%)	9 (13.8%)	9 (13.8%)
No	6 (15.8%)	5 (13.2%)	8 (21.1%)	12 (31.6%)	2 (5.3%)	5 (13.2%)
p	**0,032**					
University-level education in TCIM						
Yes	6 (12.5%)	9 (18.8%)	5 (10.4%)	8 (16.7%)	9 (18.8%)	11 (22.9%)
No	22 (40.0%)	7 (12.7%)	10 (18.2%)	11 (20.0%)	2 (3.6%)	3 (5.5%)
p	**0,001**					
National research institute for TCIM						
Yes	12 (27.9%)	5 (11.6%)	7 (16.3%)	5 (11.6%)	8 (18.6%)	6 (14.0%)
No	16 (26.7%)	11 (18.3%)	8 (13.3%)	14 (23.3%)	3 (5.0%)	8 (13.3%)
p	0.205					

TCIM = Traditional, Complementary and Integrative Medicine

A significant difference was found between WHO regions in terms of the presence of national legislation for TCIM practices (p = 0.033). The highest rate was observed in the Western Pacific Region (57.1%), while the lowest rate was in the Eastern Mediterranean Region (10.9%) (Table 4). Similarly, a significant difference was also identified among regions regarding the presence of a national authority/body responsible for TCIM policies (p = 0.032). The highest rates were again recorded in the African Region (33.8%) and the Western Pacific Region (13.8%). This indicates that TCIM has a more institutionalized structure within the health systems of some regions, while in others, it remains insufficiently organized. There was a significant regional difference in university-level TCIM education (p = 0.001). The rates of university-level education were low in the European, Eastern Mediterranean, and South-East Asian regions, whereas they were higher in the Americas and Western Pacific regions. These regional discrepancies underscore the importance of culturally sensitive and locally adapted strategies to integrate TCIM education and services equitably across diverse health systems (Patwardhan, Wieland, Aginam, Chuthaputti, Ghelman, Ghods, et al., 2023). This finding suggests that academic integration is not geographically uniform and highlights the need for region-specific approaches to education policies (Biçer & Balçık, 2019). A regional review from the WHO South-East Asia Region found that although many countries had adopted national policies, effective implementation was hampered by fragmented regulatory systems, limited financial resources, and inadequate coordination between ministries (Peltzer & Pengpid, 2018).

4. Conclusion

This study revealed significant relationships between the institutional presence of traditional and complementary medicine (TCIM) systems at the country level and socioeconomic indicators. Countries with legal regulations and institutional structures in the TCIM field were found to have higher human development levels, suggesting that integration into health systems progresses in parallel with development. Additionally, it was

determined that the education and research infrastructure for TCIM is unevenly distributed geographically, with notable structural disparities in certain WHO regions. These findings highlight the need to consider regional needs and socioeconomic conditions when developing global TCIM policies. Future studies should focus on exploring the mechanisms through which socioeconomic development facilitates or hinders the institutionalization of TCIM, as well as examining context-specific barriers and enablers in different regions to support more equitable and effective policy implementation.

Limitations

The data on which payment systems are used by 10 countries in the distribution of Traditional, Complementary, and Integrative Medicine System indicators by country is unavailable.

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Conflicts of interest

The authors declare that they have no known competing financial interests or personal relationships that could have influenced the work reported in this paper.

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