



Category: Health Sciences and Medicine

ORIGINAL

Trends and Outcomes of Traditional Medicine Treatments for Arterial Hypertension and Rheumatic Diseases in Mongolia (2021-2023)

Tendencias y resultados de la medicina tradicional mongola para el tratamiento de la hipertensión arterial y el reumatismo (2021 - 2023)

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ABSTRACT

Introduction: we analyzed morbidity, mortality, and inpatient data from 2021 to 2023, obtained from the Center for Health Development in Mongolia.

Background: this study analyzes morbidity, mortality, and inpatient data from Mongolian Traditional Medicine Departments (MTMDs) for the years 2021-2023, focusing on patients diagnosed with arterial hypertension (ICD-10 I10) and rheumatoid arthritis (ICD-10 M05), corresponding to traditional diagnoses of “wind and blood ascending disorder” and “rheumatic diseases,” respectively.

Method: data were collected from the Center for Health Development Mongolia, encompassing 1 398 cases of “wind and blood ascending disorder” and 175 cases of “rheumatic diseases.” Variables analyzed included patient demographics, hospitalization duration, and disease status.

Results: from 2021 to 2023, cases decreased annually (823 in 2021, 404 in 2022, and 171 in 2023). Ulaanbaatar and Zavkhan had the highest prevalence rates (1,5 %), while Orkhon had the lowest (0,1 %). Admissions peaked in winter and decreased in spring, with significant monthly variations ($p < 0,05$). Most patients (73,2 %) were treated in private hospitals, with a mean hospital stay of $7,07 \pm 1,73$ days. Cases varied across the years (95 in 2021, 34 in 2022, and 46 in 2023). Ulaanbaatar accounted for the majority of hospitalizations (82,1 % in 2021, 64,7 % in 2022, 30,4 % in 2023). Mean hospital stay was $7,3 \pm 1,29$ days, with significant regional differences ($p < 0,05$).

Conclusions: the incidence of “wind and blood ascending disorder” has declined, while admissions to MTMDs have increased. “Rheumatic diseases” showed a variable pattern, with significant regional and temporal differences in hospitalization rates and durations. Further research is needed to understand the underlying causes of these trends and optimize treatment protocols.

Keywords: Mongolian Traditional Medicine; Arterial Hypertension; Rheumatoid Arthritis; Morbidity; Mortality; Inpatient Care.

RESUMEN

Introducción: analizamos los datos de morbilidad, mortalidad y hospitalización obtenidos del Centro de desarrollo de la salud de Mongolia entre 2021 y 2023.

Antecedentes: este estudio analizó los datos de incidencia, mortalidad y hospitalización del sector de la medicina tradicional mongola (mtmd) en 2021 - 2023, centrándose en pacientes diagnosticados con hipertensión arterial (icd - 10 i10) y artritis reumatoide (icd - 10 m05), correspondientes a “trastornos del viento y del aumento de la sangre” y “enfermedades reumáticas” diagnosticadas tradicionalmente, respectivamente.

Método: se recopilaron datos del Centro de desarrollo de la salud de Mongolia, incluidos 1 398 casos de “trastornos del viento y la sangre” y 175 casos de “enfermedades reumáticas”. las variables analizadas incluyeron la demografía del paciente, la duración de la hospitalización y el Estado de la enfermedad.

Resultados: de 2021 a 2023, los casos disminuyeron cada año (823 en 2021, 404 en 2022 y 171 en 2023). Ulaanbaatar y zafhan tienen la mayor prevalencia (1,5 %), mientras que olhon tiene la menor prevalencia (0,1 %). El número de ingresados alcanzó su punto máximo en invierno y disminuyó en primavera, con cambios mensuales significativos ($p < 0,05$). La mayoría de los pacientes (73,2 %) fueron atendidos en hospitales privados, con una duración media de hospitalización de $7,07 \pm 1,73$ días. Los casos varían de un año a otro (95 en 2021, 34 en 2022 y 46 en 2023). Ulaanbaatar representa la mayor parte de las hospitalizaciones (82,1 % en 2021, 64,7 % en 2022 y 30,4 % en 2023). El tiempo medio de hospitalización fue de $7,3 \pm 1,29$ días, con diferencias regionales significativas ($p < 0,05$).

Conclusión: la incidencia del “trastorno de la elevación de la sangre del viento” ha disminuido, mientras que el número de admisiones en mtmd ha aumentado. El “reumatismo” muestra un patrón variable con diferencias regionales y temporales significativas en la tasa y duración de las hospitalizaciones. Se necesitan más estudios para comprender las causas subyacentes de estas tendencias y optimizar las opciones de tratamiento.

Palabras clave: Medicina Tradicional Mongol; Hipertensión Arterial; Artritis Reumatoide; Morbilidad, Mortalidad, Atención Hospitalaria.

INTRODUCTION

Traditional medicine has been an integral part of Mongolia's healthcare system, providing valuable alternatives and complements to conventional medical practices. The Mongolian Traditional Medicine Departments (MTMDs) specialize in treating various chronic diseases using traditional diagnostic and therapeutic approaches.^(1,2) Among the prevalent conditions treated are arterial hypertension and rheumatoid arthritis, which correspond to traditional Mongolian diagnoses of “wind and blood ascending disorder” and “rheumatic diseases,” respectively.

Arterial hypertension, a major global health issue, is associated with significant morbidity and mortality due to its complications, including heart disease, stroke, and kidney failure. Similarly, rheumatoid arthritis, a chronic inflammatory disorder, leads to severe joint damage and disability if not adequately managed.⁽³⁾ Despite advancements in conventional treatments, many patients seek traditional medicine for its holistic approach and cultural resonance.

This study aims to analyze the trends, outcomes, and demographic characteristics of patients treated for these conditions in MTMDs across Mongolia from 2021 to 2023. By examining morbidity, mortality, and inpatient data, we aim to provide insights into the effectiveness of traditional treatments and identify factors influencing patient outcomes.⁽⁴⁾ Understanding these patterns can inform healthcare policy, improve patient care, and integrate traditional and modern medical practices more effectively.

Through this research, we seek to highlight the role of traditional medicine in managing chronic diseases in Mongolia and contribute to the global knowledge of integrative healthcare approaches.

METHOD

A total of 32 683 patients in 2021, 54 440 patients in 2022, and 75,328 patients in 2023 were treated in the Mongolian Traditional Medicine Departments of healthcare institutions across Mongolia. For our study, we selected patients diagnosed according to the ICD-10 codes I10 (arterial hypertension) and M05 (rheumatoid arthritis), which correspond to the traditional diagnoses of “wind and blood ascending(blood pressure)disorder” (TMA00.36) and “rheumatic diseases” (TMM.14) respectively.^(4,5)

Over the past three years, a total of 1 409 patients with “wind and blood ascending(blood pressure) disorder” and 181 patients with “rheumatic diseases” received inpatient care in Mongolian Traditional Medicine Departments nationwide. From this pool, we excluded minors and those with incomplete data, resulting in a

final sample of 1 398 cases of “wind and blood asceuding(blood pressure)disorder” and 175 cases of “rheumatic diseases” for further analysis (figure 1).

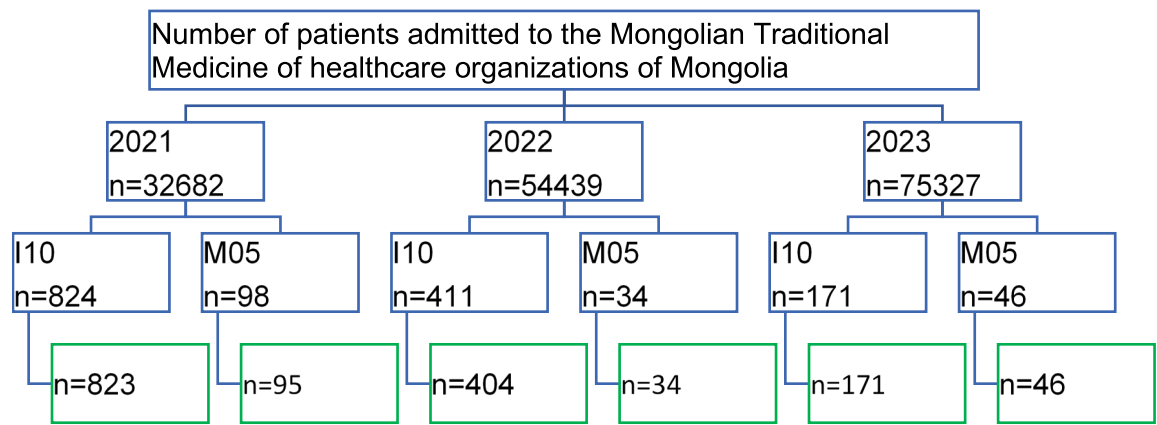


Figure 1. Sample size of the study

We obtained the 2021-2023 inpatient data from the Center for Health Development Mongolia and analyzed the records of patients hospitalized with the diagnoses of I10 (arterial hypertension, equivalent to “wind and blood asceuding(blood pressure)disorder” (TMA00.36) and (TMM.14) (rheumatoid arthritis, equivalent to “rheumatic diseases”) according to ICD-10.

RESULTS

Between 2021 and 2023, 1 398 cases of “wind and blood asceuding(blood pressure)disorder” were reported throughout Mongolia. Over the past three years, 823 cases were reported in 2021, 404 cases in 2022, and 171 cases in 2023, indicating a decreasing trend in reported cases. Conversely, the number of clients admitted to the Mongolian Traditional Medicine Department tended to increase in the coming years (figure 2).

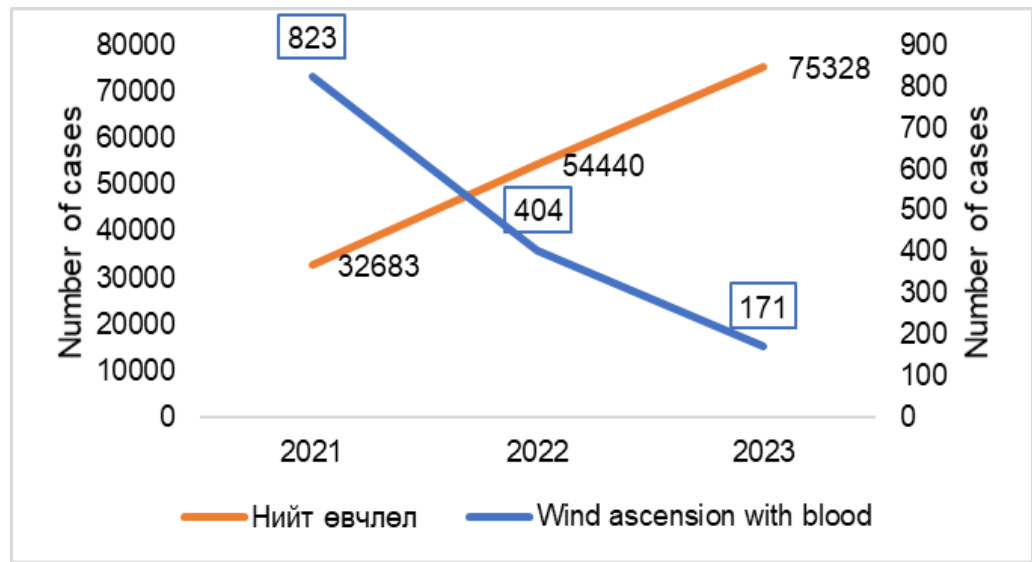


Figure 2. The total number of clients admitted to the Mongolian Traditional Medicine Department and the actual number of confirmed cases of wind and blood asceuding(blood pressure)disorder by year.

Among the total people who received traditional treatment at the Mongolian Traditional Medicine Departments, those treated for wind and blood asceuding(blood pressure)disorder were reported in Darkhan-Uul, Zavkhan, Orkhon, Uvurkhangai, Umnugobi, Sukhbaatar, Hovd, Khuvsgul, Khentii provinces, and Ulaanbaatar city. Ulaanbaatar city and Zavkhan province had the highest rates at 1,5 %, while Orkhon province had the lowest rate at 0,1 % (figure 3).

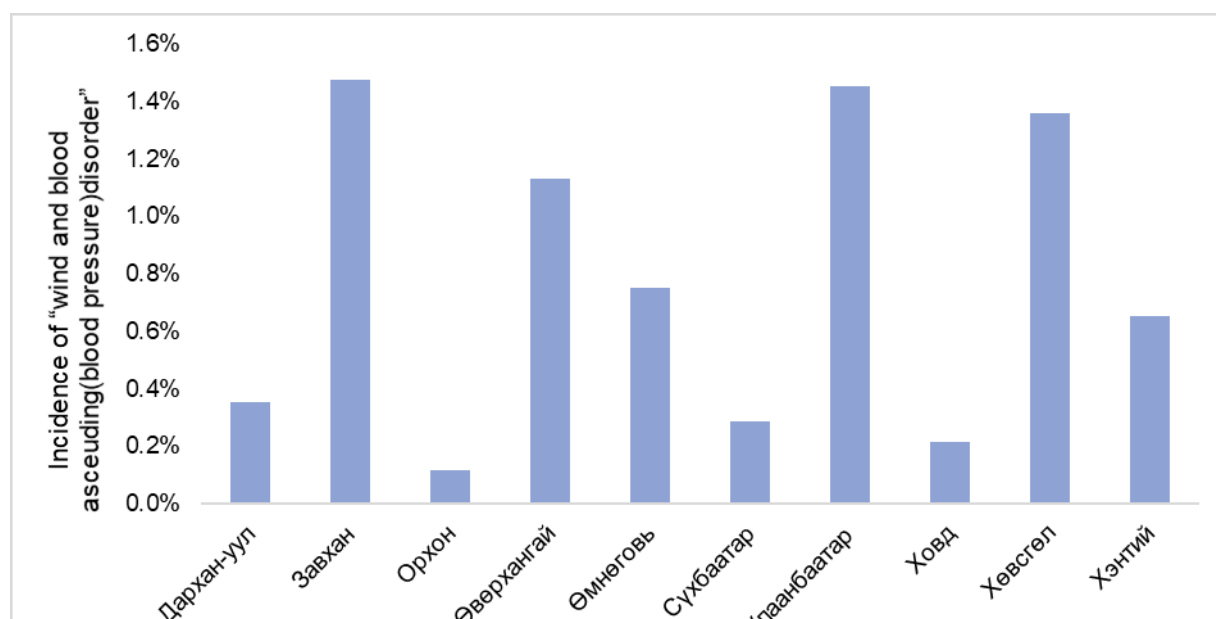


Figure 3. Proportion of patients with a diagnosis of wind and blood ascending (blood pressure) disorder in the Mongolian Traditional Medicine Departments, by province

The highest number of patients hospitalized with the diagnosis of wind and blood ascending (blood pressure) disorder was reported in March ($n=225$). It was also observed that the number of inpatient admissions tends to increase from the end of autumn (November), peak during the winter months, and decrease from the beginning of spring. The months with the least inpatient admissions were July and September. A statistically significant difference was observed between the admissions in different months (figure 4).

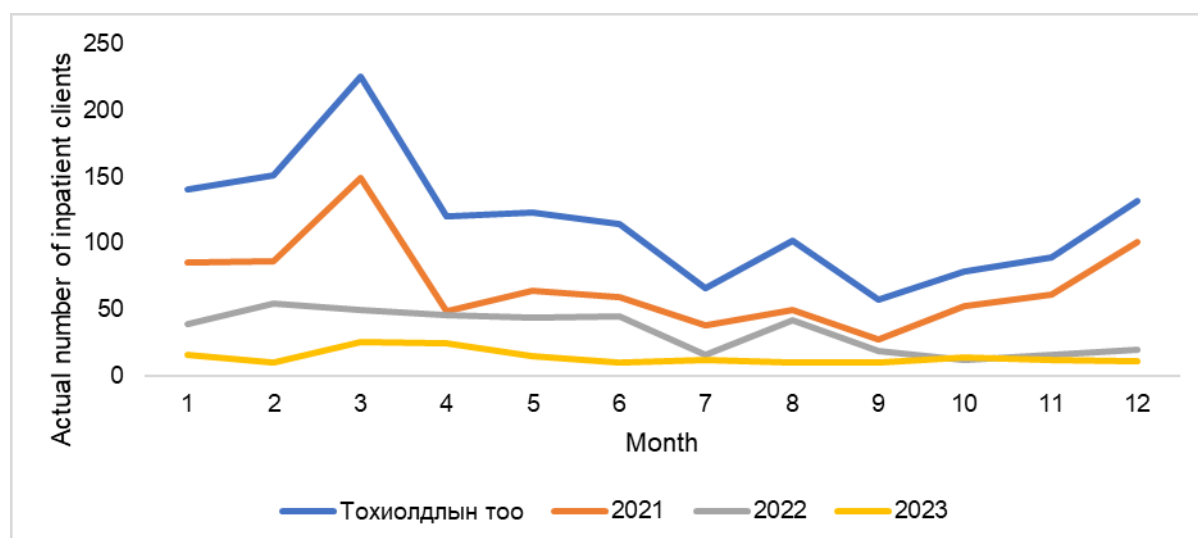


Figure 4. Number of inpatients with wind and blood ascending (blood pressure) disorder by month

In Ulaanbaatar city, 65 % in 2021, 80 % in 2022, and 90 % in 2023 of all patients admitted with wind and blood ascending (blood pressure) disorder, which is higher compared to other provinces. In Ulaanbaatar, the percentage of inpatients for wind and blood ascending (blood pressure) disorder tends to increase year by year, but the actual number of patients is decreasing: 534 cases in 2021, 322 cases in 2022, and 154 cases in 2023. Conversely, the actual number of patients hospitalized in the provinces is decreasing year by year.^(6,7,8) Additionally, in 2022, Darkhan-Uul, Orkhon, Hovd, and Khuvsgul provinces, and in 2023, Zavkhan, Hovd, and Khuvsgul provinces, there were no reported cases of wind and blood ascending (blood pressure) disorder (table 1).

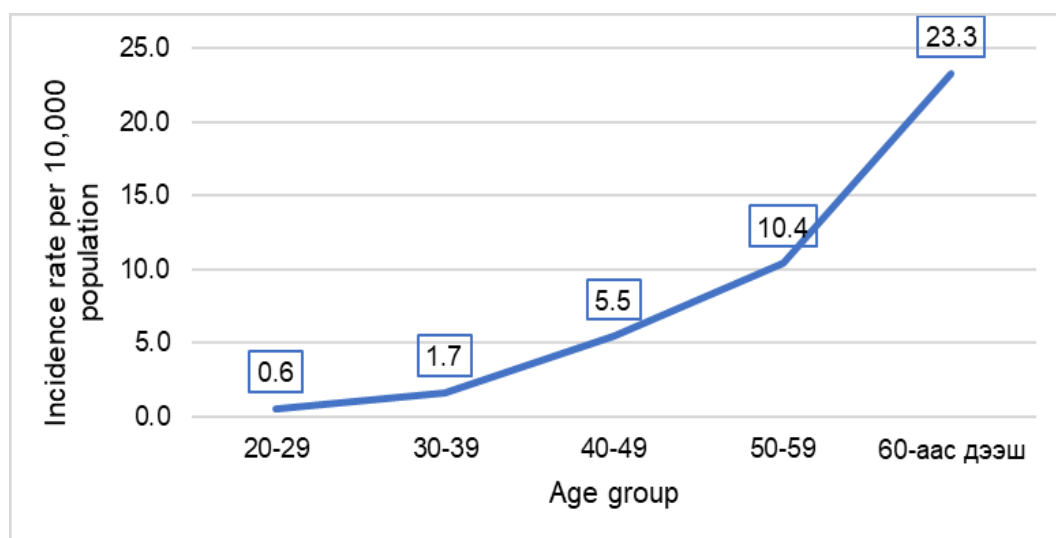
As of the last 3 years, among all inpatient admissions of wind and blood ascending (blood pressure) disorder, 73,2 % of patients were admitted to private hospitals, 7,1 % to Traditional Medicine Centers, 5,4 % to the Institute of Traditional Medicine and Technology, 4,1 % to the Central Hospital of Traditional Medicine of MNUMS, 3,5 % to the Second Central Hospital of Mongolia, 3,4 % to district and provincial hospitals, 1 % to the General Hospital For Special Government Employees, 0,8 % to Regional Diagnostic and Treatment Centers, and 0,7 % to other healthcare organizations (table 2).

Table 1. Patients admitted to the Mongolian Traditional Medicine Department of healthcare organizations due to wind and blood ascending(blood pressure)disorder by year and province

№	Province	Total	2021		2022		2023		p value
			n	%	n	%	n	%	
1	Darkhan-Uul	45	44	5	-		1	1	0,0001
2	Zavkhan	70	39	5	31	8	-		
3	Orkhon	12	10	1	-		2	1	
4	Uvurkhangai	99	70	9	28	7	1	1	
5	Umnugobi	47	29	4	11	3	7	4	
6	Sukhbaatar	6	2	0	3	1	1	1	
7	Ulaanbaatar	1010	534	65	322	80	154	90	
8	Khovd	12	12	1	-		-		
9	Khuvsgul	44	44	5	-		-		
10	Khentii	44	32	4	8	2	4	2	
11	Other	9	7	1	1	0	1	1	
Total		1398	823	100	404	100	171	100	

Table 2. Patients admitted to the Mongolian Traditional Medicine Department of the healthcare institutions due to wind and blood ascending(blood pressure)disorder by healthcare institutions

№	Healthcare institution	Total number	%	p value
1	District and provincial hospitals	48	3,4	0,0001
2	Central Hospital of Traditional Medicine of MNUMS	58	4,1	
3	Regional Diagnostic and Treatment Center	11	0,8	
4	General Hospital For Special Government Employees	14	1,0	
5	Traditional Medicine Centers	110	7,9	
6	Institute of Traditional Medicine and Technology	75	5,4	
7	Second Central Hospital of Mongolia	49	3,5	
8	Private hospitals	1 023	73,2	
9	Other	10	0,7	
	Total	1 398	100	

**Figure 5.** Incidence rate of wind and blood ascending(blood pressure)disorder per 10 000 population

The mean life expectancy of clients diagnosed wind and blood ascending (blood pressure) disorder is $58,3 \pm 13,0$ (95 %CI: 57,66 - 59,03), the youngest person is 21 years old, and the oldest person is 96 years old.

The incidence rate per 10 000 population of wind and blood asceuding (blood pressure)disorder by age group was 0,6 in the 20-29 age group, 1,7 in the 30-39 age group, 5,5 in the 40-49 age group, 10,4 in the 50-59 age group, and 23,3 in the over 60 age group (figure 5).

Clients diagnosed with wind and blood asceuding(blood pressure)disorder had a mean hospital stay of $7,07 \pm 1,73$ (95 % CI 6,98 to 7,16) with a minimum of 1 day and a maximum of 14 days of hospitalization.^(9,10)

When examining the age group and average hospital stay of clients with a diagnosis of wind and blood asceuding(blood pressure)disorder the average bed days are approximate (table 3).

Age group	Number of cases	Mean hopsital stay	Standard deviation	Min	Max
20-29	26	6,5	2,04	1	11
30-39	92	7	1,7	1	11
40-49	239	6,75	1,66	2	11
50-59	345	7,07	1,74	1	13
60 and above	696	7,2	1,71	1	14

The mean hospital stay of patients with wind and blood asceuding(blood pressure)disorder by province is as follows: Darkhan-Uul province has $8,6 \pm 1,37$ days, Zavkhan $7,54 \pm 0,97$ days, Orkhon $6,4 \pm 1,24$ days, Uvurkhangai $7,2 \pm 1,12$ days, Umnugobi $7,31 \pm 0,95$ days, Sukhbaatar $9,1 \pm 1,47$ days, Ulaanbaatar $6,8 \pm 1,85$ days, Khovd $8,1 \pm 1,02$ days, Khuvsgul $7,47 \pm 1,37$ days, and Khentii $7,81 \pm 1,16$ days. Patients admitted to rural areas were hospitalized for at least 5 days (table 4).

Province	Number of cases	Mean hospital stay	Standard deviation	Max	Max
Darkhan-Uul	45	8,6	1,37	5	10
Zavkhan	70	7,54	0,97	5	9
Orkhon	12	6,4	1,24	5	9
Uvurkhangai	99	7,2	1,12	1	10
Umnugobi	47	7,31	0,95	6	10
Sukhbaatar	6	9,1	1,47	7	11
Ulaanbaatar	1010	6,8	1,85	1	14
Khovd	12	8,1	1,02	7	9
Khuvsgul	44	7,47	1,37	5	10
Khentii	44	7,81	1,16	6	10

Rheumatic disease

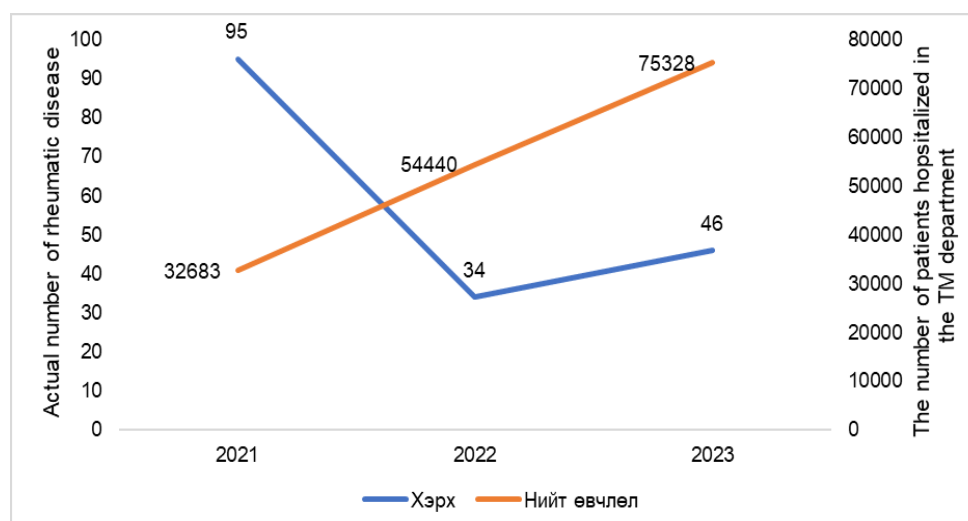


Figure 6. Number of actual cases of rheumatic diseases, by year

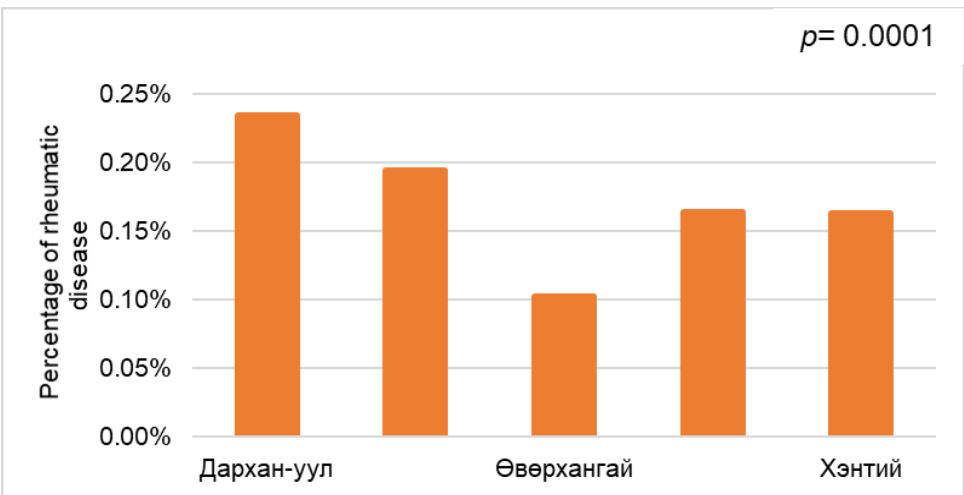


Figure 7. Percentage of patients hospitalized due to rheumatic disease in TM departments

A total of 175 cases of rheumatic diseases have been registered in Mongolia in the last 3 years. Specifically, 95 cases were reported in 2021, 34 cases in 2022, and 46 cases in 2023. On the other hand, the number of clients admitted to the Mongolian Traditional Medicine Department tended to increase in the coming years (figure 6).

Examining patients hospitalized for rheumatic disease by months of hospitalization, the highest were in February(n=29) and March(n=29), October(n=18) and in November(n=18). The lowest were in July(n=3) (figure 8).

0,23 % of people in Darkhan-Uul province, 0,19 % in Dornod province, 0,16 % in Ulaanbaatar and Khentii provinces, and 0,1 % in Uvurkhangai province were admitted to the Mongolian Traditional Medicine Department of healthcare institutes due to rheumatic disease (figure 7).

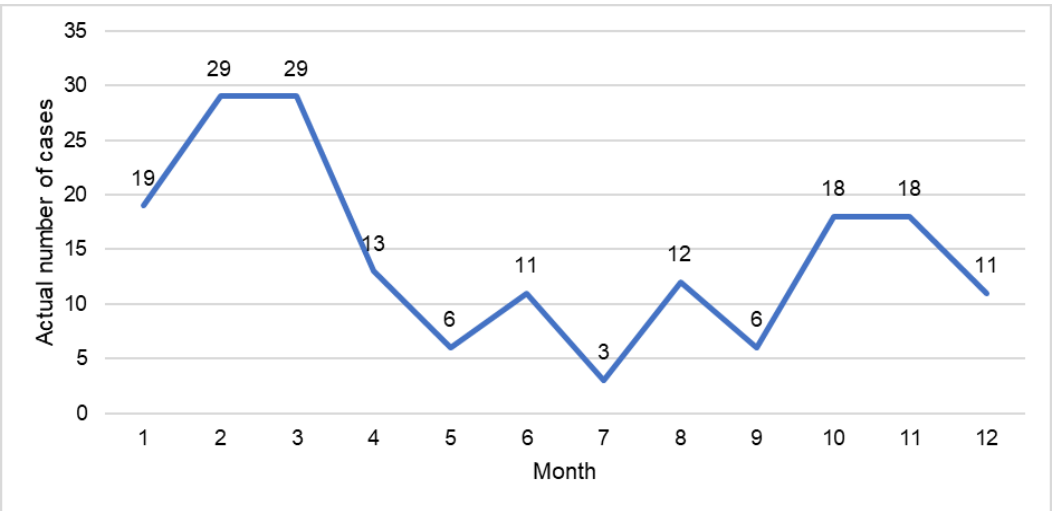


Figure 8. Number of people admitted to the hospital for rheumatic disease by month

Table 5. Number of patients admitted to Mongolian Traditional Medicine Department by year and province									
№	Province	Total number of cases	2021		2022		2023		р утга
			n	%	n	%	n	%	
1	Darkhan-Uul	30	-	-	1	2,9	29	63,0	0,0001
2	Dornod	6	6	6,3	-	-	-	-	
3	Uvurkhangai	9	6	6,3	3	8,8	-	-	
4	Ulaanbaatar	114	78	82,1	22	64,7	14	30,4	
5	Khentii	11	1	1,1	7	20,6	3	6,5	
6	Other	5	4	4,2	1	2,9	-	-	
Total		175	95	100	34	100	46	100	

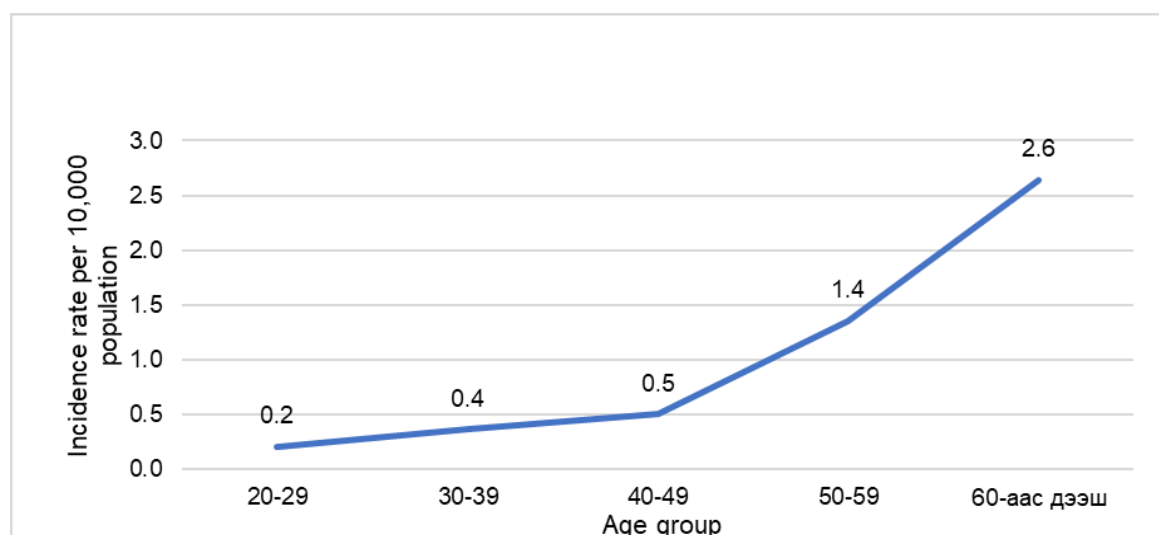


Figure 9. Rheumatic disease incidence rate per 10 000 population

Among all hospitalizations for rheumatic diseases, in 2021 Ulaanbaatar city accounted for the highest proportion (82,1 %), while Dornod and Uvurkhangai provinces each represented 6,3 %, Khentii province accounted for 1,1 %, and other provinces comprised 4,2 %. In 2022, 64,7 % of all hospitalizations were in Ulaanbaatar city, while Darkhan and other provinces combined for 2,9 %. In 2023, 63 % of all hospitalizations were recorded in Darkhan city, 30,5 % in Ulaanbaatar city, and 6,5 % in Khentii province (table 5).

In the past 3 years, 86,9 % (n=152) of people hospitalized with rheumatic diseases were treated in private hospitals, 9,7 % (n=17) in traditional medical centers, and 3,4 % (n=6) in other medical institutions.

The mean life expectancy of clients diagnosed with rheumatic disease was $55,1 \pm 14,2$ years (95 % CI 53,07 to 57,31), with the youngest being 20 years old and the oldest being 87 years old.⁽¹¹⁾

When examining rheumatic disease by age group, the incidence rate per 10 000 population is 0,2 in the 20-29 age group, 0,4 in the 30-39 age group, 0,5 in the 40-49 age group, 1,4 in the 50-59 age group, and 2,6 in the over 60 age group (figure 9).

Clients diagnosed with rheumatic disease had a mean hospital stay of $7,3 \pm 1,29$ days (95 % CI 7,11 to 7,5), with a minimum of 5 days and a maximum of 10 days of hospitalization. When examining the age group and average hospital stay of clients with a diagnosis of rheumatic disease, the average bed days are approximate.⁽¹²⁾ However, due to certain characteristics of this disease, hospitalization seems to require at least 5 days of medical care (table 6).

Table 6. Age group and mean hospital stay of clients with a diagnosis of asthma

Age group	Number of cases	Mean hospital stay	Standard deviation	Min	Max
20-29	9	6,5	1,58	5	10
30-39	20	7,5	1,6	5	10
40-49	22	7,18	1,29	5	10
50-59	45	7,53	1,43	5	10
60 and above	79	7,2	1,06	5	10

Table 7. Duration of hospital stay due to the rheumatic disease by province

Province	Number of cases	Mean hospital stay	Standard deviation	Min	Max
Darkhan-Uul	30	7	-	7	7
Dornod	6	8,3	1,5	6	10
Uvurkhangai	9	7	0,7	6	8
Ulaanbaatar	114	7,29	1,45	5	10
Khentii	11	7	-	7	7
Other	5	9,4	1,34	7	10

When examining the duration of hospital stay of people hospitalized for rheumatic disease by province, the following averages were observed: Darkhan-Uul: 7 days, Dornod: $8,3 \pm 1,5$ days, Uvurkhangai: $7 \pm 0,7$ days,

Ulaanbaatar: $7,29 \pm 1,45$ days, Khentii: 7 days, Other provinces: $9,4 \pm 1,34$ days on average. Clients hospitalized in rural areas are hospitalized for at least 6 days, while in Ulaanbaatar they are hospitalized for 5 days (table 7).

DISCUSSION

Between 2021 and 2023, the cases of “disorders of wind and blood increase” and “rheumatic diseases” treated in Traditional Mongolian Medicine Departments (MTMD) showed divergent trends. Cases of “disorders of wind and blood increase” decreased from 823 in 2021 to 171 in 2023, while hospital admissions for these disorders increased, particularly in Ulaanbaatar. This discrepancy could suggest a higher preference for traditional hospital treatments or improved MTMD capabilities to handle more complex cases previously treated elsewhere.^(13,14)

The prevalence of “disorders of wind and blood increase” and “rheumatic diseases” varies significantly between regions and seasons. Ulaanbaatar and Zavkhan have the highest prevalence rates, while provinces like Orkhon and Darkhan-Uul have the lowest. These regional differences may be due to variations in access to traditional medical care, cultural acceptance of traditional medicine, or environmental and socioeconomic factors.⁽¹⁵⁾

Temporally, hospital admissions for both conditions increase in winter and decrease in spring and summer. This pattern might relate to climatic factors exacerbating symptoms or variations in agricultural and labor activities affecting when people seek treatment.

Most patients were admitted to private hospitals (73,2 % for “disorders of wind and blood increase” and 86,9 % for “rheumatic diseases”). This preference could reflect perceptions of better quality care in the private sector or the greater capacity of these hospitals to offer specific traditional treatments. Additionally, the average hospital stay was similar for both conditions, with an average duration of around 7 days, indicating a relatively uniform standard of treatment. The incidence of both conditions increases with age, being more significant in people over 50. This is consistent with medical literature indicating that both hypertension and rheumatoid arthritis are more prevalent in older individuals. The average duration of hospitalization also slightly increases with age, potentially reflecting the greater complexity of cases in older patients.

In contrast, the incidence of “rheumatic diseases” showed variability, with a significant proportion of cases concentrated in Ulaanbaatar. The substantial number of hospitalizations in private facilities and the differences in mean hospital stay across regions emphasize the diverse healthcare landscape and potential disparities in access to traditional medical care.

Overall, the study underscores the importance of traditional medicine in the Mongolian healthcare system, particularly for chronic disease management. The data indicate a need for ongoing monitoring and evaluation of traditional medicine practices to ensure optimal patient outcomes. Future research should explore the integration of traditional and conventional treatments, patient satisfaction, and long-term health impacts to enhance the effectiveness of healthcare delivery in Mongolia.

The insights gained from this study can inform healthcare policy, resource allocation, and the development of comprehensive care models that leverage the strengths of both traditional and modern medicine, ultimately improving the health and well-being of the Mongolian population.

CONCLUSION

This study provides a comprehensive analysis of the trends and outcomes of patients treated for arterial hypertension (“wind and blood ascending disorder”) and rheumatoid arthritis (“rheumatic diseases”) in Mongolian Traditional Medicine Departments (MTMDs) from 2021 to 2023. The findings reveal significant temporal and regional variations in the incidence and management of these conditions.

For “wind and blood ascending disorder,” a notable decrease in the number of cases was observed over the three-year period, despite an increase in admissions to MTMDs. This trend suggests improvements in early diagnosis and outpatient management or changes in healthcare-seeking behavior. Ulaanbaatar and Zavkhan provinces exhibited the highest prevalence rates, indicating potential areas for targeted public health interventions. The seasonal pattern of admissions, with a peak in winter, underscores the need for increased healthcare resources and patient education during colder months. The predominance of private hospitals in providing care highlights the critical role of the private sector in managing chronic diseases in Mongolia.

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