ORIGINAL RESEARCH



ISSN (O): 2349-5332
CODEN: IRJPHY

# COMPARATIVE ANALYSIS OF CETIRIZINE AND CHLORPHENAMINE SYRUP UTILIZATION IN A RESOURCE-CONSTRAINED SETTING: A CASE STUDY OF JORDANIAN ROYAL MEDICAL SERVICES HOSPITALS.

**Rania Ahmad Ali Al Efaishat;PH[1], Shireen Tayseer Andrawes;PH[1], Bayan Mohammad Khair Saleh Alrjoub;PH[1].**

[1]Pharmacist, Royal Medical Services, Jordan

**Submitted on:** 02.06.2025; **Revised on:** 04.06.2025; **Accepted on:** 05.06.2025

**ABSTRACT:**

**1. Introduction:** The Jordanian Royal Medical Services (JRMS), an influential healthcare institution in Jordan, encounters the complex challenge of reconciling medication accessibility with financial and logistical limitations. In response to this challenge, JRMS has strategically selected two specific antihistamine formulations (Cetirizine Syrup and Chlorphenamine Syrup) as the primary options for the management of allergic conditions within its pediatric patient population. This decision reflects a commitment to streamline inventory and ensure consistent access to essential medications. This research will analyze the dispensing behavior of Cetirizine Syrup and Chlorphenamine Syrup within six prominent JRMS seeking to yield insights regarding the utilization of these two antihistamines and evaluate the influence of stock management practices on the availability of medications. The results will guide the development of strategies aimed at enhancing medication management in resource-limited environments.

**2. Objective:** The primary objective of this research is to examine the dispensing behaviors of Cetirizine Syrup and Chlorphenamine Syrup within JRMS hospitals over a four-year timeframe, specifically from 2020 to 2023.

**3. Methodology:** This research will utilize a quantitative, retrospective methodology to examine dispensing data sourced from JRMS medical storage facilities. The analysis is going to include three distinct phases: an examination of annual and hospital-specific consumption trends, a comparative assessment of the utilization of Cetirizine and Chlorphenamine Syrups, and the application of statistical methods to identify significant discrepancies in dispensing quantities. Descriptive statistics and visual tools will effectively summarize and illustrate the data. The results will offer valuable insights into utilization behaviors, which may enhance medication management and patient care in settings with limited resources.

**4. Results:** Between 2020 to 2023 dispensing trends of Cetirizine and Chlorphenamine Syrups across JRMS hospitals varied. Chlorphenamine Syrup was a consistently high dispenser until it peaked at 5,840 in the year 2022, suggesting a clinical preference possibly due to its sedative effect. Cetirizine Syrup experienced erratic usage, dropping sharply in 2021–likely as a result of stock shortages–before rising again in 2022 and 2023. Queen Rania Al Abdullah Hospital for Children received the greatest volumes of both syrups consistently. Statistical and comparative analyses confirmed institutional preferences, seasonal demand, and distribution shortage risks.

**Keywords:** Antihistamines, Cetirizine Syrup, Chlorphenamine Syrup, Medication Dispensing Patterns, Jordanian Royal Medical Services (JRMS), Prescribing Preferences, Inventory Management.

**Corresponding author: R. A. Ali Al Efaishat**
**E-mail: r.efaishat@hotmail.com,**
**Mobile no: +962 7 7777 0999**

Indian Research Journal of Pharmacy and Science; 43(2025); 3260-3267
Journal Home Page: https://www.irjps.in

## 1. INTRODUCTION:

Antihistamines are an important group of medicines commonly used to treat allergic diseases and hypersensitivity reactions. antihistamine medications work against the binding of histamine with its receptors which causes the allergic response and allergic symptoms like itch, sneeze, runny nose and rashes [1]. Cetirizine and chlorphenamine are presently one of the most commonly used and available antihistamines in pediatric and adult practice. Doctors prefer to prescribe cetirizine for the treatment of chronic allergic conditions due to its non-sedating properties [2]. Chlorphenamine is a first-generation antihistamine renowned for its quick onset of action, significant antihistamine effect and sedative property. It is effective for acute allergies and useful for people who benefit from drowsiness [3].

The Jordanian Royal Medical Services (JRMS) is a key player in Jordan's healthcare system, providing a comprehensive range of medical services to not only military personnel and their dependents but also to civilians. JRMS has a huge network of hospitals and medical warehouses that distribute drugs, including antihistamines, to its hospitals as part of its mandate [4]. It is essential to manage these medications appropriately to ensure high levels of patient care in a system which has to cope with a huge patient load. Learning the patterns of dispensing will assist in better inventory management and prescribing patterns, as well as it will ensure that patients have uninterrupted access to these medicines.

Between the years 2020 and 2023, the world and the region confronted global and regional challenges that were unlike anything that had ever been experienced before, caused by the COVID-19 pandemic, which affected the supply chain and escalated pressure on the health system throughout the world. In Jordan, the COVID-19 pandemic worsened the challenges related to the availability and distribution of medicines, stressing the need for effective stock management [5]. From 2020 to 2023, the demand for antihistamines remained high due to the adverse allergic effects of the COVID-19 virus that trigger hypersensitivity reactions, including allergic ones. The pandemic emphasized the need for efficient data driven management of medicines as the healthcare systems coped to reconcile medication availability with patient requirement in times of limited availability [5].

This research attempts to show the dispensing patterns of Cetirizine Syrup and Chlorphenamine Syrup from the medical warehouses of JRMS to the Prince Rashid Ben Al-Hasan Military Hospital, Prince Hashem Ben Al-Hussein Military Hospital, Queen Alia Military Hospital, Queen Rania Al Abdullah Hospital For Children, Princess Haya Bint Al-Hussein Military Hospital, and King Talal Military Hospital. These hospitals accept many adult and child and military patients making them suitable to study the dispensing and prescribing patterns of these commonly used anti-histamines. By examining the dispensing data over a four-year period, this study investigates the patterns in the dispensing of those two medicines and how these medicines are used at different health facilities.

This study's main objective is to analyze the dispensing data of Cetirizine Syrup and Chlorphenamine Syrup from 2020 to 2023 in order to evaluate consumption trends, identify any medical practitioner's preferences, and examine the period of stock out or quantity dispensed variations. The study also aims to help understand the dispensing of these medicines in the JRMS network and their implications. This study's outcome will contribute to a better understanding of antihistamine usage patterns at a macro level in this large system and help in improving the availability and stock management within the JRMS.

This study is significant in that it will influence decision making within the JRMS and other similar health systems. Through the identification of dispensing trends and areas for improvement, this study aims to ensure that patients are given continuous access to essential medications, reduce stock-outs and improve utilization of healthcare resources. Moreover, the research serves as a basis for future inquiries into medication usage patterns, especially in light of changing health-care challenges and the demand for resilient and efficient health-care systems. This study offers a productive contribution to the academic work relating to medicine utilization and management. Though there are a number of studies on the clinical efficacy and safety of antihistamines, there isn't as much literature related to the dispensing patterns and utilization of antihistamines in large healthcare systems in the Middle East. This study examens the pattern of antihistamine prescription and dispensing in the real world inside the JRMS network. The findings of this study can also be used by other health care systems facing similar challenges in availability and stock of the medication.

To sum up, this study looks at the dispensing of Cetirizine Syrup and Chlorphenamine Syrup in JRMS hospitals between 2020 and 2023, focusing

on consumption trends, prescribing habits and stock management. Through, the findings will help improve the management of medicine and patient care in JRMS and beyond. By examining these trends, the researchers hope to get a better understanding of how these antihistamine drugs are used in a large system and how to ensure that such essential drugs are always available. All in all, this study highlights how data-driven approaches in medication management can help achieve optimal patient outcomes and resource utilization.

## 2. METHOD:

**2.1 Data Source:** The data used was obtained from JRMS medical warehouses and provided the average monthly dispensed quantity by six of the JRMS hospitals for Cetirizine Syrup and Chlorphenamine Syrup. The hospitals are Prince Rashid Ben Al-Hasan Military Hospital, Prince Hashem Ben Al-Hussein Military Hospital, Queen Alia Military Hospital, Queen Rania Al Abdullah Hospital For Children, Princess Haya Bint Al-Hussein Military Hospital, and King Talal Military Hospital. The data collected are from the year 2020 to the year 2023.

**2.2 Data Analysis:** This study is designed to examine how Cetirizine Syrup and Chlorphenamine Syrup are dispensed in six major hospitals in the Jordanian Royal Medical Services from 2020 to 2023. It uses a quantitative method whereby dispensing data obtained from the JRMS medical warehouses will be used to study the trend in the consumption of the medication, possible prescribing preference, and shortages' periods. The data source, methodology, and statistics upon which the study is based are given in subsequent sections.

**Data Source:** The data for this study was attained from JRMS medical warehouses which maintain detailed records of medication dispensing to all hospitals and it showed the monthly average amounts of a drug that is dispensed to the six major JRMS hospitals (i.e., Prince Rashid Ben Al-Hasan Military Hospital, Prince Hashem Ben Al-Hussein Military Hospital, Queen Alia Military Hospital, Queen Rania Al Abdullah Hospital For Children, Princess Haya Bint Al-Hussein Military Hospital, and King Talal Military Hospital). The data of this study covered the utilization of a medication in a four-year time period from 2020 to 2023. The structure of the dataset was built in a manner that each medication had certain variables and they consisted of: year, hospital name, and average monthly quantity dispensed. This structure allows for an in-depth analysis of dispensing patterns across various hospitals and over time and it was checked for completeness and accuracy.

**Analytical Framework:** The study's analytical framework consists of three components: consumption trends, hospital-specific utilization and comparative assessment. Every part has a purpose and aims to answer specific research questions regarding when and how often JRMS dispersed these syrups. The first part of the analysis investigates yearly consumption trends for both drugs. This is done by calculating the total amount given every year to each hospital of both the medicines and also checks the change in amounts over the years of the four year period. When the trend analysis is conducted, the study aims to show whether there is an increase or decrease in the use or if there is any stock shortage period. The second component of the analysis involves looking at how medication was distributed across the six hospitals. The quantities of Cetirizine Syrup and Chlorphenamine Syrup dispensed to each of the six hospitals will be compared to see whether the hospitals have a preference for either of the drugs and it will also investigate whether any hospital consistently received more of one drug than the other, which may reflect variances in patient's profiles, clinical guidelines, or physician preferences. The third part of the study compares the dispensing of both Cetirizine Syrup and Chlorphenamine Syrup to determine whether one syrup is more highly dispensed than the other by each hospital over time. The research also delves into possible reasons that may favor the choice of one medication above other considering factors like efficacy, side effects and cost. Descriptive statistics were applied to summarize the data and provide an overview of drug utilizations. To compare the consumption pattern of these hospitals over the time, bar charts were used. The data was compared statistically to reveal any large differences in dispensing quantities which helps to highlight periods of possible stock shortages or shifts in prescribing habits.

**Ethical Considerations:** The study was done following ethical protocols for using secondary data for research purposes. This research used anonymized data with no patient identifiers as per ethical guidelines for studies involving secondary data. And in line with improving the medication and patient management of JRMS, the data was obtained with permission from the JRMS administration.

**3. RESULTS:** Between 2020 and 2023, the dispensing data analysis of Cetirizine Syrup and Chlorphenamine Syrup in the six hospitals of the Jordanian Royal Medical Services (JRMS) showed some insightful results including: the usage of these

drugs, the preferences of the hospitals for them, and the possible times of stock shortages. The findings are presented according to annual consumption trends, utilization per hospital, and comparison analysis where statistical techniques were used to highlight notable differences and patterns in the data.

**Annual Consumption Trends:** Between 2020 and 2023, the dispensing of Cetirizine Syrup varied considerably. In the year 2020, the aggregate quantity which was dispensed of all the six hospitals was 1454. The highest quantity which was received by Queen Rania Al Abdullah Hospital For Children was 610, while the lowest quantity which was received by King Talal Military Hospital was 100 (figure 1). The dispensing of drug was greatly reduced in 2021 as the total quantity was 956. The dispensing quantities fell by 55% in Prince Rashid Ben Al-Hasan Military Hospital and by 71% in Prince Hashem Ben Al-Hussein Military Hospital. The sharp decrease could be a stock shortage period or a change in prescribing patterns this year. In 2022, the dispensing pattern picked up for the dispensing of Cetirizine Syrup with the total quantity being at 1,881. All hospitals experienced an uprise, as Queen Rania Al Abdullah Hospital For Children continued to receive the most quantity (623 units). The increases continued right up through 2023, with total quantity 1,921 units. We can infer from the data that there is continuously growing demand for Cetirizine Syrup.

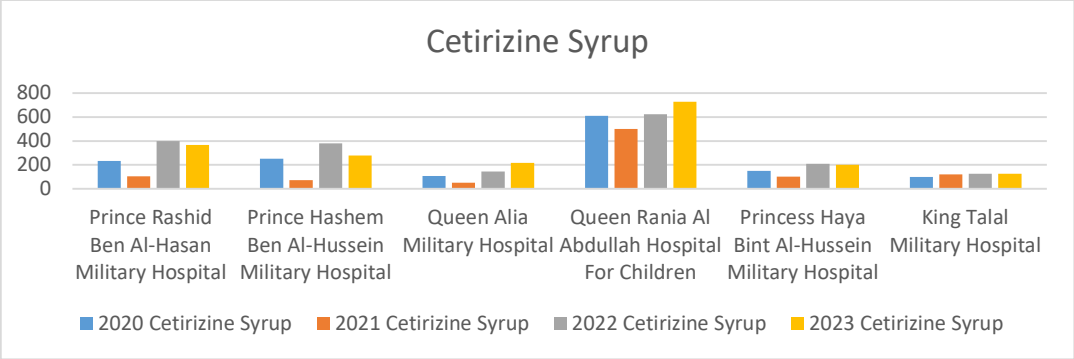


**Figure 1: Annual Consumption Trends of Cetirizine Syrup**

The dispensing of Chlorphenamine syrup had a different pattern, with a consistently higher quantity than cetirizine syrup (figure 2). In 2020, total quantity dispensed was 3495 where Queen Rania Al Abdullah Hospital For Children received the highest quantity (1003 Units) and Queen Alia Military Hospital received the lowest quantity (170 Units). The quantity in 2021 decreased to 2,530 in total whereby Prince Hashem Ben Al-Hussein Military Hospital received the highest quantity (1,003). The decrease could indicate a temporary depression in demand or a reaction to outside forces like the COVID-19 pandemic. The dispensing of Chlorphenamine Syrup was much higher in 2022; total quantity reached 5,840 units. All hospitals showed increase in dispensing with Queen Rania Al Abdullah Hospital For Children receiving the highest quantity of 1,588 units. The increase was also noted in 2023 where the total quantity remained high at 5,090 units. The prolonged rise is indicative of a selection preference for Chlorphenamine Syrup.

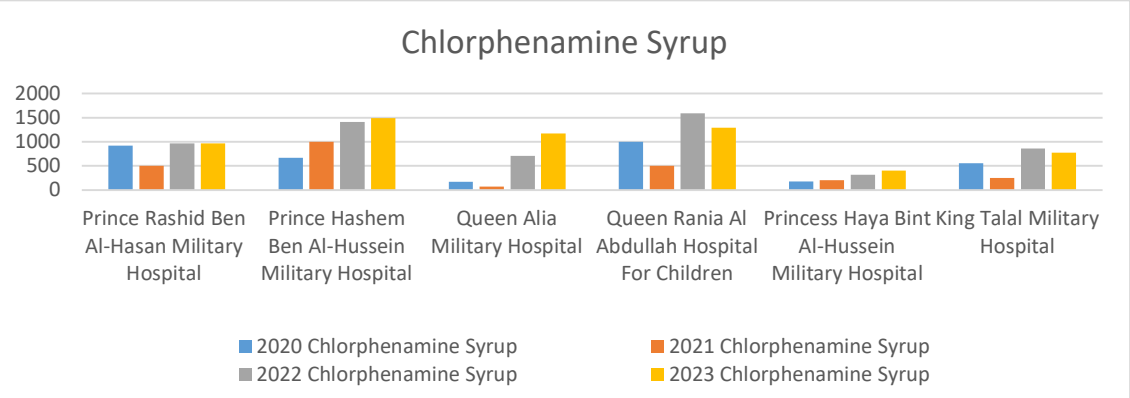


**Figure 2: Annual Consumption Trends of Chlorphenamine Syrup**

**Hospital-Specific Utilization:** The analysis showed a big difference in the use of Cetirizine Syrup between the six hospitals. Queen Rania Al Abdullah Hospital For Children was dispensed the highest amount originally in 2020 (42%) and in 2023 also (52%). This shows the preference of this hospital for this syrup and it's probably due to the non-sedating nature of the syrup and long duration [6]. On the other hand, the lowest quantities for Cetirizine Syrup were received by King Talal Military Hospital over the entire study period with 117 units annually. This may reflect a lesser need for Cetirizine Syrup in this hospital, maybe due to patient demographics or prescribing practices. All six hospitals offered various volumes of Chlorphenamine Syrup. The largest quantities, approximately 29% and 28% of dispensing, were recorded at Queen Rania Al Abdullah Hospital For Children and Prince Hashem Ben Al-Hussein Military Hospital, respectively, in the year 2023. This shows that there is a strong possibility that the two hospitals use Chlorphenamine Syrup because of its fast action and sedative effect which is beneficial for the management of acute allergic reactions or in pediatrics. During the study period, Queen Alia Military Hospital received the least quantities of Chlorphenamine Syrup, with 530 units dispensed on average yearly. The lower quantity of Chlorphenamine Syrup supplied to Queen Alia Military Hospital throughout the study period imply a lower demand for Chlorphenamine Syrup in this hospital.

**Comparative Analysis:** The analysis of Cetirizine Syrup and Chlorphenamine Syrup revealed interesting findings. Chlorphenamine Syrup was consistently given out in a higher amount as compared to Cetirizine Syrup with average annual dispensing ratio of 2.5:1. This indicates that Chlorphenamine Syrup is evidently preferred across the JRMS network perhaps due to its efficacy, cost-effectiveness and suitability for acute allergic reaction. The study also found a significant change in the dispensation of Cetirizine Syrup, which dropped by 34% in total in 2021 compared to 2020. On the other hand, the dispensation of Chlorphenamine Syrup remained stable with no significant variation being noted.

**Statistical Analysis:** A time-series study was conducted to explore the trends in the medication dispensing to observe the trend trends in utilization. Between 2020 and 2023, the dispensing of Chlorphenamine Syrup showed a significant upward trend. Queen Rania Al Abdullah Hospital For Children and Prince Hashem Ben Al-Hussein Military Hospital experienced a trend of increased dispensing, with the annual dispensing quantities increasing by 29% and 123%, respectively. In 2021, the amount of Cetirizine Syrup given out dropped significantly. Fortunately, this trend improved in 2022 and 2023. Thus, it's possible that stock shortages were the reason for 2021's disappointing figures. Likewise, changing prescribing practices may also have altered the dispensing patterns [7].

**Periods of Stock Shortages:** The analysis found possibilities of stock shortages by the variations in dispensing amounts. The substantial drop in 2021 may reflect a period of stock shortages for Cetirizine Syrup during 2021, especially at Prince Rashid Ben Al-Hasan Military Hospital and Prince Hashem Ben Al-Hussein Military Hospital. Chlorphenamine Syrup showed no remarkable declines during the period which indicates stock availability. The sudden surge in dispensing in 2022 suggests that there may have been a response to the shortage or an increase in demand due to seasonal allergies or other factors [7]. In summary, the study's results show the dispensing patterns of Cetirizine Syrup in JRMS hospitals from 2020 to 2023. This is a very important insight for the stock managers of these formulations. Overall, this study shows the trends in prescribing preferences of Cetirizine Syrup and Chlorphenamine Syrup in large systems but further research is required.

**4. DISCUSSION:** The result of this research gives a very meaningful insights into the dispensing patterns of Cetirizine Syrup and Chlorphenamine Syrup in six major hospitals belonging to the Jordanian Royal Medical Services (JRMS) from 2020 to 2023. And gave some trends and patterns that can have significant implications for medication management, prescribing and patient care in JRMS setting. This discussion section places the findings in context, providing possible explanations for observed patterns and implications of these findings for health professionals and policy makers.

An important finding of this study is that all six hospitals in which the study was carried out preferred Chlorphenamine Syrup to Cetirizine Syrup. Throughout the course of this study, Chlorphenamine was dispensed in far greater quantities, with an annual average dispensing ratio of 2.5:1 to Cetirizine. The reason for the above finding might be due to several reasons. First off, Chlorphenamine acts rapidly when compared to Cetirizine. It also has potent antihistaminic action and sedative action [6]. This may make it effective in providing immediate relief from acute allergic manifestations. Chlorphenamine's sedative effect may also help calm children with severe allergic symptoms. A basis for the preference for

Chlorphenamine can also be its economic efficacy and availability in settings with limited resources [7,8]. Conversely, Cetirizine might be regarded as less effective for acute situations as it is a non-sedating medication [3]. Furthermore, it also has a slower onset of action. In lower and middle-income settings, Chlorphenamine is still commonly used which might reflect its low cost and easy availability.

Fewer quantities of Cetirizine Syrup were dispensed compared to Chlorphenamine but there was a significant variation throughout the study. High use of first-generation antihistamines, particularly Chlorphenamine, in low- and middle-income settings has been documented before [9]. This is likely due to limited cost and the availability of alternatives. Compared to 2021, Cetirizine Syrup was dispensed in a quantity less than that of Chlorphenamine but showed considerable variability over the study period. External factors could have contributed to this decline in addition to changes in prescription and dispensing practices [5,7], such as the COVID-19 pandemic that disrupted global supply chains. From 2022 to 2023, the dispensing of Cetirizine rose again indicating that the stock of Cetirizine was replenished and the use of Cetirizine in chronic allergy diseases again rose. The fact that cetirizine is non-sedating makes it a drug of choice in chronic cases in adults and children [3]. The increased use of Cetirizine in Queen Rania Al Abdullah Hospital For Children further supports its significance in pediatric treatment, where non-sedating antihistamines are frequently preferred for daytime usage [6].

The study showed a noteworthy discrepancy in medication utilization among the six hospitals, implying differences in patient profiles, clinical needs, and prescribing habits. Queen Rania Al Abdullah Hospital for Children has received the most quantities for both drugs which highlight the significance of antihistamines in pediatric use. Chlorphenamine could have been used more frequently than Cetirizine due to the former's effectiveness in managing acute allergic reactions in children while the latter could have been prescribed for maintenance of chronic conditions [3]. King Talal Military Hospital received the lowest quantities of both medications, perhaps reflecting a different case mix of patients or clinical priorities. For instance, general military hospitals may have lower prevalence of allergic diseases compared to pediatric specific hospitals resulting in less demand for antihistamines. On the other hand, prescribing guidelines or formulary preferences differ may also explain these differences.

The implications revealed by this study have special significance for drug management in JRMS. The continued disposition of choosing Chlorphenamine Syrup calls for the necessity of availability and monitoring of the stock for shortage. The rapid rise in Chlorphenamine dispensing in 2022 indicates that demand for this drug may be variable depending on increasing need particularly in peak seasonal situation. To ensure that stock levels are not adversely affected by shortages, proactive stock management through predictive analytics will be able to help. The different levels of use of the Cetirizine syrup show the need to carry a balanced stock of first and second-generation antihistamines. Some acute management cases may lead to doctors preferring Chlorphenamine, but Cetirizine is heavily used for chronic cases and should be made available for patients. The reduction in dispensing of Cetirizine in 2021stresses the fact that external factors can affect the dispensing of a medication.

The results of this study could also be used for other healthcare systems beyond that of JRMS. Firstly, the resource constrained scenario is indicative of the continuing relevance of first-generation antihistamines in the low- and middle-income countries. Secondly, cost and availability are the key determinants [8]. Yet, the first-generation antihistamines are not without a risk as the sedative nature of these drugs may impair the cognitive and motor functions of at-risk populations [6]. The awareness of the dangers of using first-generation antihistamines calls for continued education and training of health professionals, as well as evidence-based guidelines and patient-specific considerations.

The study also emphasizes how data-driven approaches to medication management can help generate optimal patient outcomes and efficient resource usage. By looking at how drugs are given out with thought to what is happening inside and outside the healthcare system, it will help improve how and where drugs are available. It will also reduce the risk of shortage. Also implementing electronic health records to evaluate medication usage as well as predictive analytics to anticipate medication use can useful strategies to promote optimal medication use in medical health systems.

**Future Research Directions:** Though this study shows the dispensing pattern of Cetirizine Syrup and Chlorphenamine Syrup, there is a need for further studies to know the prescribing and using pattern of the drug in detail. Future analysis can concentrate on the effect of patients age, sex, co-morbid condition etc., on the prescribing pattern. Future research can investigate external factors, like the COVID-19 pandemic, which impact medication utilization and

stock management. Future research may also be needed to explore the effectiveness and safety of first- and second-generation antihistamines in practice. Although clinical trials have proved the efficacy and safety of these medicines, there is not much evidence for their comparative effectiveness in everyday clinical practice. More Studies that compare patient outcomes, adherence rates, and adverse events associated with different antihistamines could provide valuable insights for optimizing prescribing practices and improving patient care.

## 5. CONCLUSION:

This study analyzes and examines the dispensing pattern of Cetirizine Syrup, and Chlorphenamine Syrup at six major hospitals of JRMS (Jordanian Royal Medical Services) from 2020 to 2023. It provides insight into the dispensing patterns of Cetirizine Syrup, and Chlorphenamine Syrup at the hospitals of JRMS, how they are different across hospitals. In addition, it reveals any important periods of stockout and their impact on drugs distribution.

The findings demonstrate a clear preference for Chlorphenamine Syrup over Cetirizine Syrup, with continuously higher dispensing of Chlorphenamine in all hospitals. This could be due to its quick action, sedative effects, and cost-effectiveness, which might make it more useful in acute allergic reactions when compared to Cetirizine. As Queen Rania Al Abdullah Hospital For Children and Prince Hashem Ben Al-Hussein Military Hospital have strong demand for Chlorphenamine Syrup, it suggests they require it a lot and may favor its use for being effective and well-tolerated. Cetirizine Syrup, on the other hand, had more variable dispensing with a noted decline in 2021, which could imply a lack of stock or change in prescribing patterns. Even though there was a drop, overall, it Cetirizine distribution rates saw an increase between 2022 and 2023, particularly in children's hospitals suggesting that it is an important drug for chronic allergy diseases.

According to the findings of this study, there could be stock-out periods for Cetirizine Syrup in 2021, which could have impacted patient care in select hospitals. These results highlight the need for a strong inventory system to ensure the availability of essential medicines to avert stock shortages. The surge in dispensing of Chlorphenamine Syrup in 2022 further stresses the need for proactive stock management to meet changing demand, especially during peak seasons when demand shoots up.

The differences in drug use across different hospitals indicate that the way drugs are prescribed at these hospitals may be influenced by various factors. For instance, the utilization of both drugs in Queen Rania Al Abdullah Hospital For Children is quite high, which indicates the importance of antihistamines in pediatrics, whereas the low utilization in King Talal Military Hospital may suggest differences in patient needs. The differences seen indicate that clinical guidelines should be the same and healthcare providers should also be trained to provide similar outcomes in all the JRMS facilities. To sum up, this study shows how making use of data related to medicines can help achieve the best results in patients. By identifying trends in the dispensing of medications, and areas of improvement, the study helps enhance the availability of medications and reduce the risk of stockout situations and ensures the consistent availability of essential medications for all patients within the JRMS.

**Limitations of the Study:** Although this study gives insights into the dispensing pattern of Cetirizine Syrup and Chlorphenamine Syrup but has some limitations. Firstly, data collection was from JRMS medical warehouse so other factors affecting this utilization of medication could not be accounted for including patient demographics, clinical guidelines, or prescribing behaviors of doctors. The second constraint was the limited time frame of the study from 2020 to 2023, which did not account for long-term trends and the impact of external incidence like COVID-19 pandemic. Although the pandemic is likely to have had an effect on drug usage during this phase, the analysis of this study does not overtly analyze it impact on prescribing and dispensing patterns. Future studies may evaluate how the pandemic affected the use of medication more accurately.

**Conflict of Interest:** The authors have no conflicts of interest to disclose regarding this study. This research was entirely performed in accord with findings presented objectively without any interference. The study was designed and implemented with the aim of adding to the literature and improving medication use and patient care within the JRMS network. No financial support or assistance was obtained from pharmaceutical companies or any other organizations that may affect the study.

**REFERENCE:**


1. Ardhanareeswaran, K. (2021). Antihistamines: Definition. In *Encyclopedia of Autism Spectrum Disorders* (pp. 253-254). Cham: Springer International Publishing.
2. Golightly, L. K., & Greos, L. S. (2005). Second-generation antihistamines: actions and efficacy in the management of allergic disorders. *Drugs*, *65*, 341-384.
3. Aelony, Y. (1998). First-generation vs second-generation antihistamines. *Archives of internal medicine*, *158*(17), 1949-1950.
4. Hammad, E. A., Alabbadi, I., Taissir, F., Hajjwi, M., Obeidat, N. M., Alefan, Q., & Mousa, R. (2022). Hospital unit costs in Jordan: insights from a country facing competing health demands and striving for universal health coverage. *Health Economics Review*, *12*(1), 11.
5. Alqutob, R., Al Nsour, M., Tarawneh, M. R., Ajlouni, M., Khader, Y., Aqel, I., ... & Obeidat, N. (2020). COVID-19 crisis in Jordan: Response, scenarios, strategies, and recommendations. *JMIR public health and surveillance*, *6*(3), e19332.
6. Ng, K. H., Chong, D., Wong, C. K., Ong, H. T., Lee, C. Y., Lee, B. W., & Shek, L. P. C. (2004). Central nervous system side effects of first-and second-generation antihistamines in school children with perennial allergic rhinitis: a randomized, double-blind, placebo-controlled comparative study. *Pediatrics*, *113*(2), e116-e121.
7. Hay, J. W., & Leahy, M. (2005). Cost and utilization impacts of oral antihistamines in the California Medi-Cal program. *Value in Health*, *8*(4), 506-516.
8. Hay, J., Jhaveri, M., Tangirala, M., & Kaliner, M. (2009, November). Cost and resource utilization comparisons of second-generation antihistamines vs. montelukast for allergic rhinitis treatment. In *Allergy & Asthma Proceedings* (Vol. 30, No. 6).
9. Blaiss, M. S. (2002). Cost-effectiveness of H1-antihistamines. *Histamine and H1-antihistamines in allergic disease*, 335-352.
10. Sullivan, P. W., Follin, S. L., & Nichol, M. B. (2003). Transitioning the second-generation antihistamines to over-the-counter status: a cost-effectiveness analysis. *Medical care*, *41*(12), 1382-1395.


CONFLICT OF INTEREST REPORTED: NIL; SOURCE OF FUNDING: NONE REPORTED