

DESCRIPTIVE STUDY ON HOSPITALIZATION EPISODES DUE TO GASTRODUODENAL ULCER IN ROMANIA, IN THE LAST DECADE

Carmen SASU¹, PH specialist
Marius CIUTAN¹, PH specialist

¹ National Institute of Management and Health Services

INTRODUCTION

Peptic ulcer disease is one of the most common diseases worldwide, with an estimated prevalence of 8.09 [95% CI 6.79–9.58] million people in 2019, an increase of approximately 25.82% since 1990. The age-standardized prevalence rate was 99.40/100,000 population in 2019, a decrease of 143.37/100,000 population since 1990 [1]. By gender, age-standardized prevalence, incidence, mortality, and DALY rates were higher in men than in women after the age of 29. Globally, Southeast Asia has the highest age-standardized prevalence rate (156.62/100,000 population in 2019) [1]. The incidence of cases increased from 2.82 million in 1990 to 3.59 million in 2019, an increase of 27.3% globally, but the age-standardized incidence rate decreased from 63.84/100,000 population in 1990 to 44.26/100,000 population in 2019. Referring to the burden of disease, the value of DALYs in 2019 attributable to gastrointestinal ulcers was 6.03 million, with a reduction in the age-standardized rate of 60.64% compared to 1990 [1]. Mortality from this condition also experienced a similar trend, with age-standardized rates for mortality from gastroduodenal ulcers decreasing in both sexes from 1990 to 2019 [1]. One of the most common causes of ulcers is *Helicobacter pylori* (HP) infection, with 2015 data showing the highest prevalence in Africa (70.1%; 95% CI, 62.6–77.7) and the lowest prevalence in Oceania (24.4%; 95% CI, 18.5–30.4). In 2015, there were 4.4 billion people with HP in the world [2]. In Europe, data show the lowest prevalence in northern Europe and the highest in eastern and southeastern Europe, with countries such as Portugal and Poland having rates as high as 84% [3]. In Romania, the prevalence of ulcers is 8–10%, being more common among men, the male/female ratio in the case of gastric ulcers being 1.5, more common between the ages of 30–50, while duodenal ulcers, which are 2 times more common than gastric ulcers, often appear between the ages of 20–40 [4]. Given the high frequency of this type of infection worldwide (it is estimated that more than 50% of the world's population is infected with HP) and the existence of an increased risk of ulcer complications, both hemorrhagic complications and the possibility of perforation of the intestinal wall or, more seriously, the possibility of malignancy of ulcerative lesions, it is necessary to know the dynamics of the degree of damage to the population, and to take effective measures to prevent these complications. The present study analyzes the evolution of gastroduodenal ulcer episodes that required hospitalization in the last ten years, the results being presented below.

Gastroduodenal ulcer is a fairly common condition worldwide, with an upward trend since 1990, affecting people of all ages, but onset occurs most often at a young age. In addition to the frequency of occurrence, what is worrying is the fact that very often the cause of digestive ulceration is a pathogenic agent whose prevalence in the general population is high, often present without causing sufficiently strong symptoms so that the patient does not present to the doctor, but which in time predisposes to the appearance of a formidable complication such as gastric neoplasm. Timely treatment and monitoring of these patients manages to prevent important costs for both patients and the health system, while saving many lives.

Keywords: gastroduodenal ulcer, hospitalization, Romania

OBJECTIV

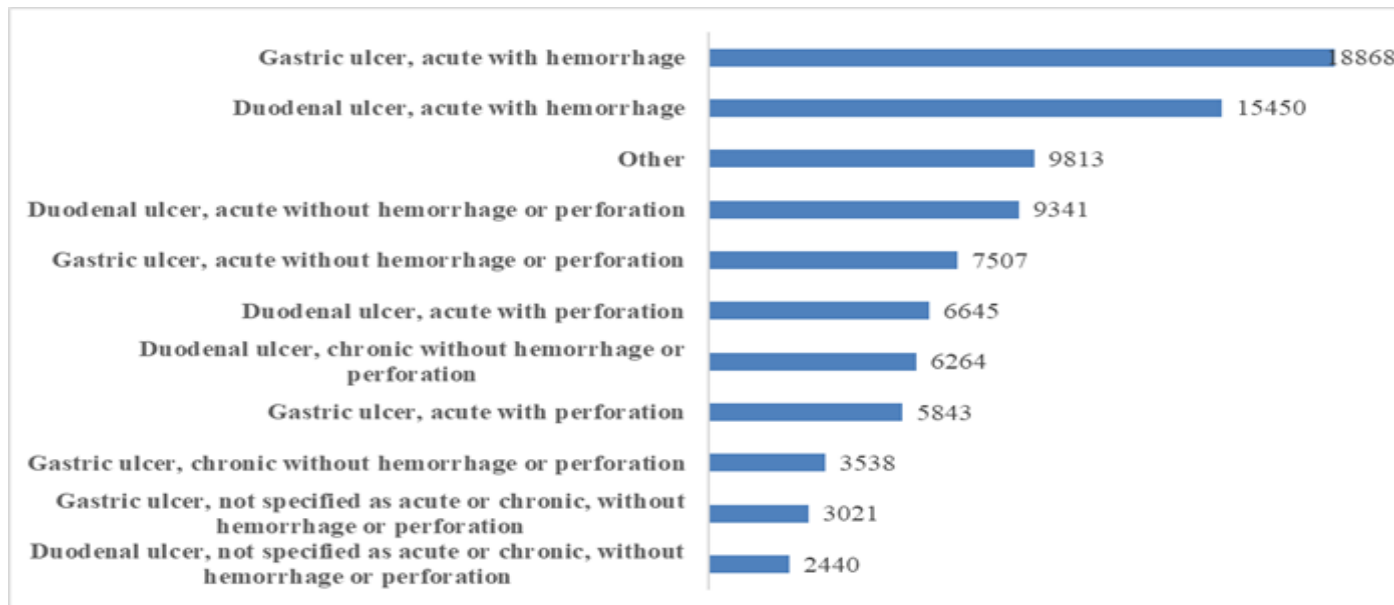
Identification at national, regional, and local level of the geographical distribution of hospitalization episodes in patients with gastroduodenal ulcer, as well as the temporal evolution of their number, during the period 2014–2024.

METHODOLOGY

A descriptive, retrospective study was conducted, with data coming from the National DRG Database, data reported in continuous hospitalization by hospitals in Romania in contractual relationship with the National Health Insurance House. In accordance with the provisions of Order. no. 1782/576/2006 on the registration and statistical reporting of patients receiving medical services in continuous hospitalization and day hospitalization, with subsequent additions and amendments, National Institute of Health Services Management (NIHSM) collects and processes the minimum set of data at patient level for cases treated in continuous and day hospitalization.

The study used data reported in 2014–2024, aiming to analyze data on hospitalization episodes in patients with gastroduodenal ulcer in Romania, in the aforementioned hospitals (continuous hospitalizations). The data were selected using the ICD-10-AM classification, and records from observation sheets were extracted and analyzed, which most frequently had as main diagnosis one of the following codes: K25 Gastric ulcer, includes: ulcer (peptic): pyloric, of the stomach, excludes: acute erosive hemorrhagic gastritis (K29.0), erosion (acute) of the stomach (K29.6), peptic ulcer NOS (K27.-); K26 Duodenal ulcer includes: ulcer (peptic): duodenal, post pyloric, excludes: erosion (acute) of the duodenum (K29.8), peptic ulcer NOS (K27.-); K27 Peptic ulcer, unspecified site includes: gastroduodenal ulcer, peptic ulcer NOS, excludes: peptic ulcer of newborn (P78.8); K28 Gastrojejunal ulcer includes: ulcer (peptic): anastomotic, gastrocolic, gastrointestinal, gastrojejunal, jejunal, marginal, stomal, excludes: primary ulcer of small intestine (K63.3). The following four-character subdivisions are used in categories K25–K28: .0 Acute with hemorrhage. 1 Acute with perforation. 2 Acute with both hemorrhage and perforation. 3 Acute without

Graph no. 1. Episodes reported in continuous hospitalization according to the type of main diagnosis at discharge, in patients with gastroduodenal ulcer, recorded during 2014-2024, at national level (first 10 diagnoses)



hemorrhage or perforation. 4 Chronic or unspecified with hemorrhage. 5 Chronic or unspecified with perforation. 6 Chronic or unspecified with both hemorrhage and perforation. 7 Chronic without hemorrhage or perforation. 9 **Not specified as acute** or chronic, without hemorrhage or perforation.

In accordance with the provisions of Law 190/2018 and Art. 13 of EU Regulation no. 679/2016, personal data are deleted upon transmission to NIHSM, and the identification of persons for the purpose of analysis is based on encrypted personal code. The age of the patients was calculated in years, as the difference between the date of admission and the date of birth. The data were processed using the SQL Server Management Studio Express 2005 software program, the subsequent processing and analysis was performed using SPSS and Excel programs. The analysis was performed according to a series of demographic and socioeconomic variables, such as age, length of hospitalization, discharge status, etc., information included in the minimum data set reported in the DRG system by hospitals. The interpretation and presentation were performed as tables and graphs.

RESULTS

The data extracted from the national DRG database were processed, analyzed, and interpreted in relation to a series of demographic variables and socioeconomic characteristics (sex, age, area of residence, length of hospitalization, in-hospital mortality rate, discharge status) tracking the geographical distribution and temporal evolution of hospitalization episodes of patients with gastroduodenal ulcer, from hospitals in our country, during the period 2014-2024.

1. Total number of hospitalization episodes in patients with gastroduodenal ulcer, registered in Romania, during 2014-2024

Number of episodes of continuous hospitalization for patients with gastroduodenal ulcer registered in Romania, during the period 2014-2024, was 88,730 episodes, of which most were diagnosed as gastric ulcer, acute with hemorrhage (21.3%), duodenal ulcer, acute with hemorrhage (17.4%) or duodenal ulcer, acute without hemorrhage or perforation (10.5%) graph no. 1.

2. Temporal evolution of hospitalization episodes in patients with gastroduodenal ulcer, in Romania, during 2014-2024

The temporal evolution of hospitalization episodes of patients with gastroduodenal ulcer during this period can be seen in graph no. 2. It is noted that the situation of hospitalizations is downward, the downward slope being constant even in the period before the coronavirus pandemic, reaching the lowest level in 2020, when the number recorded was 2.7 times lower than the initial year. In subsequent years, hospitalizations began to increase slightly, so that in 2024 the reduction observed compared to 2014 was 2.2 times.

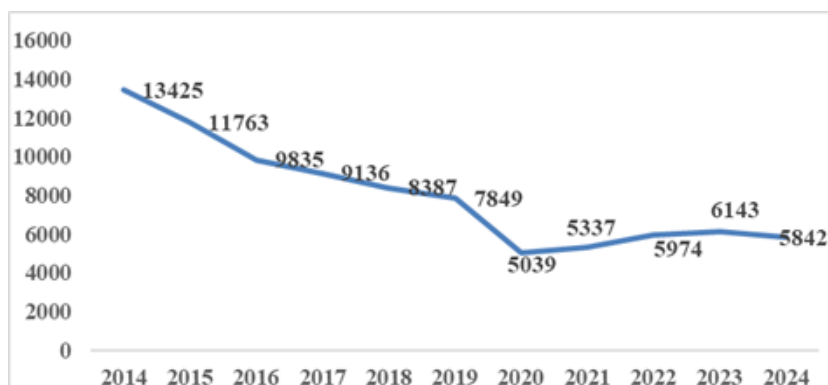
3. Distribution of hospitalization episodes in patients with gastroduodenal ulcer, depending on the discharge department

The most hospitalization episodes for patients with gastroduodenal ulcer were recorded in the surgery departments (45.7% of the total), gastroenterology (34%) and internal medicine (19%).

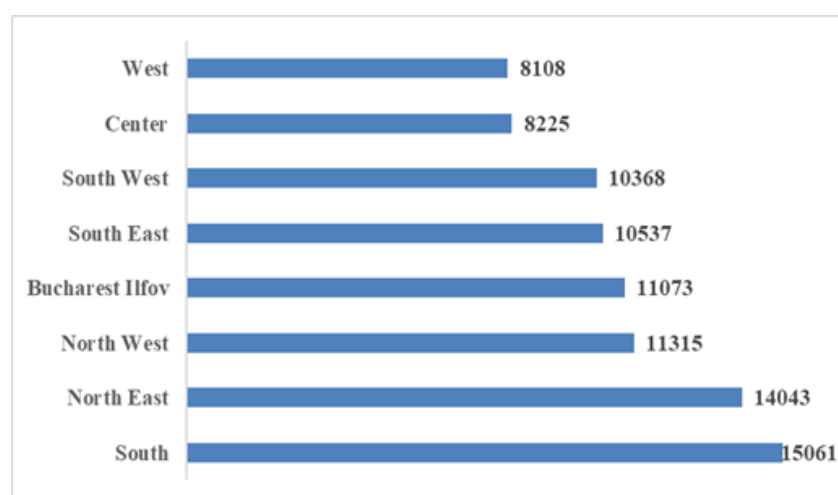
4. Distribution of hospitalization episodes in patients with gastroduodenal ulcer, at regional and local level, during 2014-2024

In terms of residential area where patients come from, it is found that the most hospitalization episodes were recorded for patients from urban areas (52%). At regional

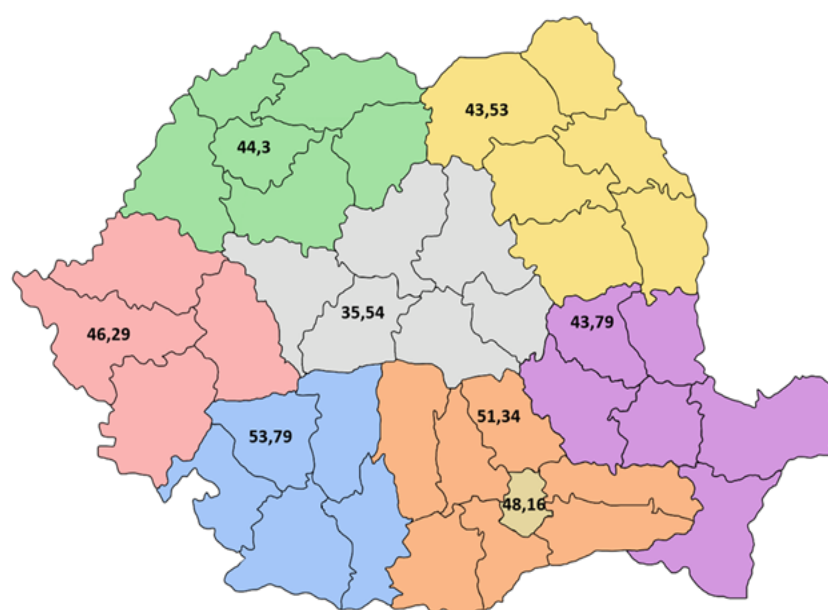
Graph no. 2. Evolution of hospitalization episodes, in patients with gastroduodenal ulcer, recorded during the period 2014-2024, at national level



Graph no. 3. Distribution of hospitalization episodes in patients with



Graph no. 4. Distribution of hospitalization episodes in patients with gastroduodenal ulcer, by population (10-year average) at regional level, in Romania, between 2014-2024



level, the most hospitalization episodes for patients with gastroduodenal ulcer were recorded during the study period in South region (17% of the national total), North-East (16%) Bucharest Ilfov and North West (12-13%). The West and Center regions with approximately 9% had the fewest hospitalizations - graph no.3.

Compared to the number of inhabitants (average population over the last 10 years in each region), the descending order of regions that recorded hospitalization episodes of ulcer patients was: South West region (53.8 episodes/10,000 people), South region (51.3 episodes/10,000 people), Bucharest Ilfov (48.2 episodes/10,000 people), West (46.3 episodes/10,000 people), North West region (44.3 episodes/10,000 people), South East region (43.8 episodes/10,000 people), North East (43.5 episodes/10,000 people) and Center region (35.5 episodes/10,000 people) - graph no. 4.

At the local level, the most hospitalization episodes were recorded between 2014-2024 in Bucharest, which has approximately twice as many episodes as the next leading counties, Prahova and Cluj - graph no. 5.

Compared to the population of each county (calculated as the average of the 10 years), a change in the ranking is observed in graph no. 6, with the counties of Teleorman (76.92 episodes/10,000 people), Tulcea (69.9 episodes/10,000 people) and Arad (62.7 episodes/10,000 people) in the first places, and the counties of Mureș, Brașov and Bistrița Năsăud in the last places.

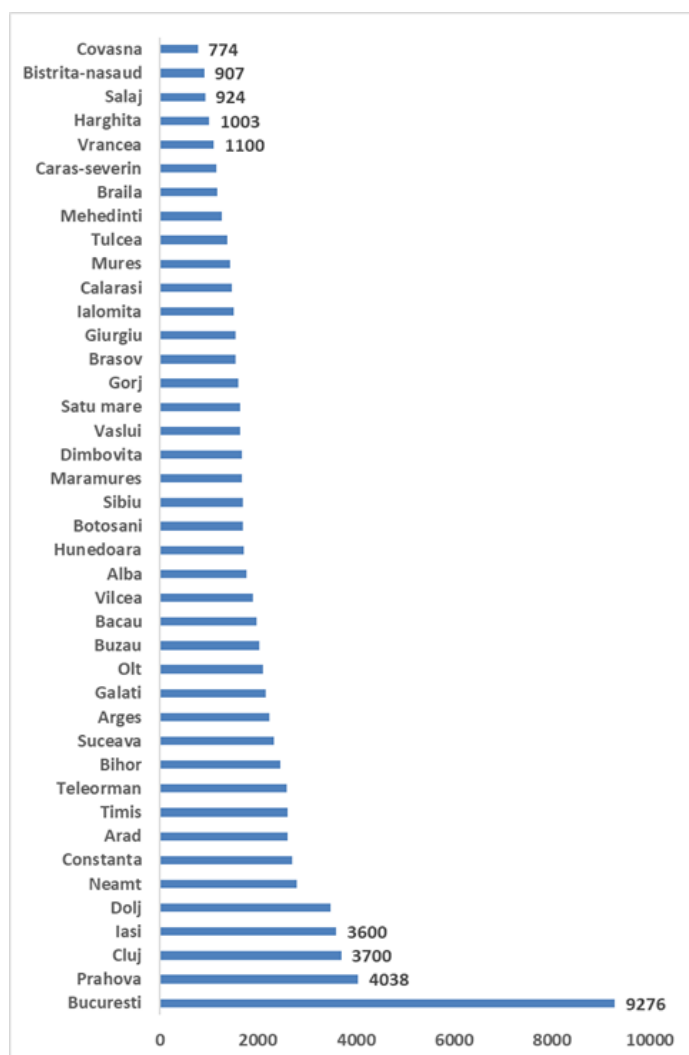
5. Hospitalization episodes in patients with gastroduodenal ulcer, depending on the patient's gender

Of the total number of hospitalization episodes with this type of main diagnosis at discharge, recorded during the study period, most belonged to men, approximately 64%, and the distribution of cases according to the type of diagnosis and sex can be seen in graph no. 7. The largest differences observed between the 2 sexes according to the diagnosis at discharge are recorded for acute duodenal ulcer with perforation, 3.6 times more hospitalization episodes in men, and acute gastric ulcer with perforation, also almost 3 times more frequently hospitalized in men

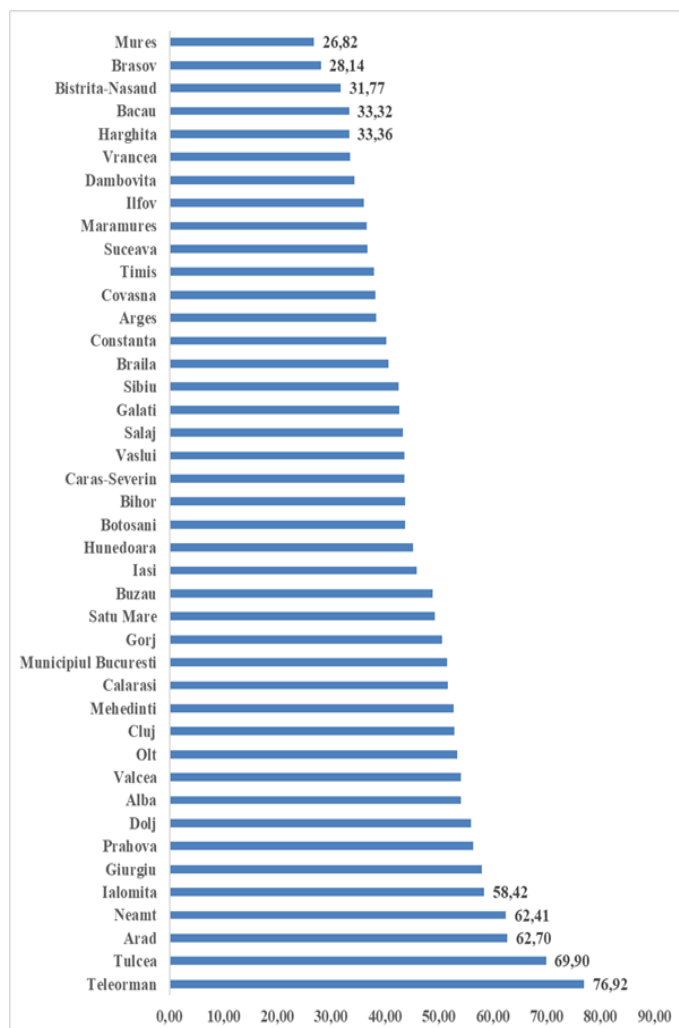
6. Hospitalization episodes in patients with gastroduodenal ulcer, depending on the patient's age

The analysis of data by age group shows that for the entire study period, most hospitalization episodes were recorded in adults over 40 years of age (86% of the total) – graph no. 8. The average age of those hospitalized during this

Graph no. 5. Distribution of hospitalization episodes in patients with gastroduodenal ulcer, at local/county level, in Romania, during 2014-2024



Graph no. 6. Distribution of hospitalization episodes in patients with gastroduodenal ulcer, at local/county level, depending on the population (10-year average) of each county, during 2014-2024



period was 59.26 years, the average age values for the most frequent diagnostic codes at discharge being 64.43 years for gastric ulcer, acute with hemorrhage and 60.07 years for duodenal ulcer, acute with hemorrhage.

7. Distribution of hospitalization episodes in patients with gastroduodenal ulcer, depending on the average duration of hospitalization

The average length of stay for inpatient episodes for patients with gastroduodenal ulcer in continuous hospitalization was 6.78 days in the period 2014-2024, varying throughout the study period, with the maximum value observed in 2020 and 2022 (6.98 days, 6.91 days, respectively), and the minimum value recorded in 2024 – 6.60 days. The highest average values of the length of stay were recorded in patients hospitalized for gastrojejunal ulcer, acute with both hemorrhage and perforation (11.8 days), duodenal ulcer, acute with both hemorrhage and perforation (11.6 days) or gastric ulcer, acute with both hemorrhage and perforation (11.18 days).

8. Hospitalization episodes in patients with gastroduodenal ulcer, depending on the patient's discharge status and the in-hospital mortality rate

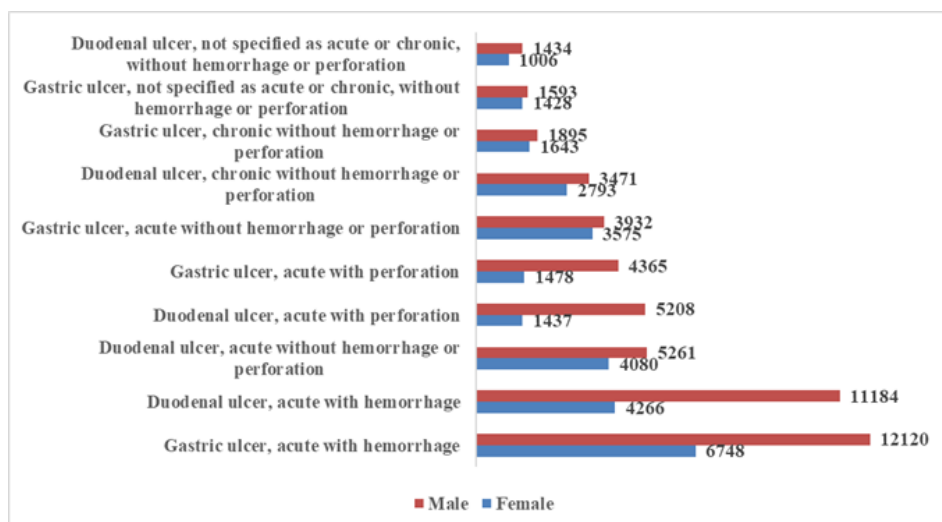
Depending on the patient's condition upon discharge, data analysis indicates that of the total number of episodes reported in continuous hospitalization in patients with gastroduodenal ulcer, most of them were discharged in an improved condition (73.13% of the total) or cured (20%), while 4.5% died – graph no. 9.

The calculated in-hospital mortality rate was 4.5% over the entire study period, with values ranging between 2.35% in 2014 and 8.3% in 2021. Most of the deceased were elderly (average age of the deceased being 70.4 years) diagnosed with acute gastric or duodenal ulcer with bleeding.

CONCLUSIONS

The conclusions that emerge from the analysis of data regarding the hospitalization of patients with gastroduodenal ulcer, are the following:

Graph no. 7. Hospitalization episodes in patients with gastroduodenal ulcer, depending on the patient's gender and type of diagnosis, during the period 2014-2024, at national level



- The total number of hospitalization episodes in patients diagnosed with gastroduodenal ulcer was 88730 episodes;

- The temporal evolution of the number of hospitalization episodes due to gastroduodenal ulcer is a downward trend from the period before the coronavirus pandemic, reaching the lowest level in 2020, when the number recorded was 2.7 times lower than the initial year; - Most hospitalizations were recorded in the surgical, gastroenterology and internal medicine departments;

- In terms of the main diagnosis at discharge, most episodes were recorded for the diagnosis of acute gastric ulcer with hemorrhage, acute duodenal ulcer with hemorrhage or acute duodenal ulcer without hemorrhage or perforation;

- More than half of those hospitalized come from urban areas;

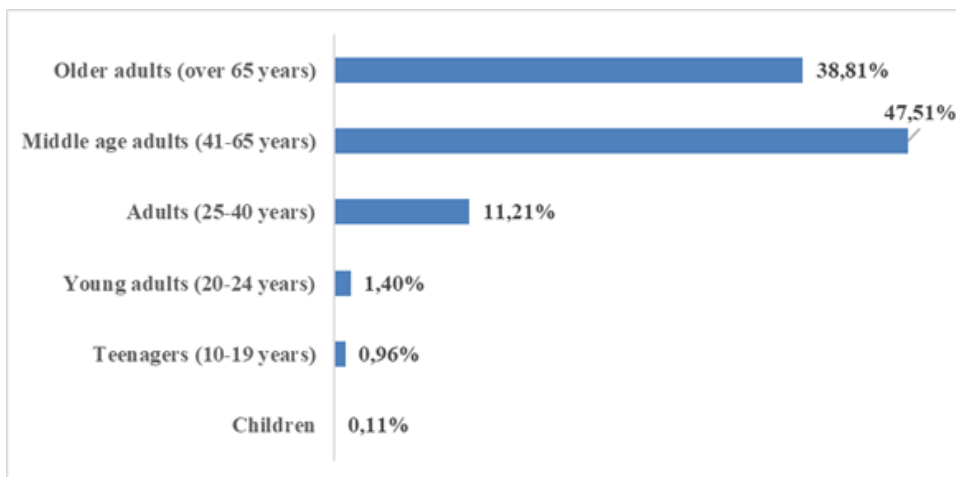
- The analysis of the spatial distribution of hospitalizations by these types of diagnosis indicates a predominance in terms of absolute frequency of cases in the South, North-East, Bucharest Ilfov and North West regions, while in relation to population the leading regions were: the West, South and Bucharest Ilfov regions;

- Locally, the highest absolute frequencies of the number of hospitalizations were recorded in Bucharest, approximately twice as many episodes as the next leading counties

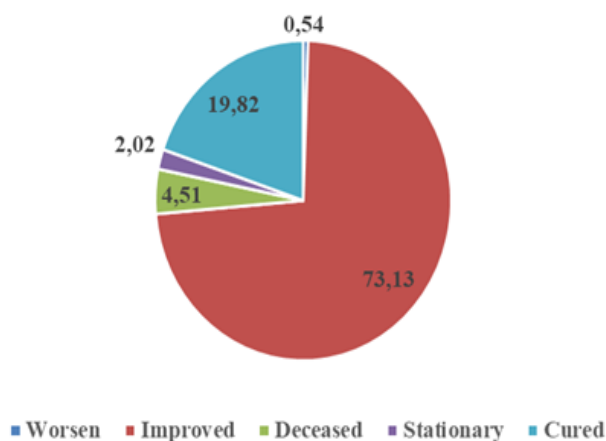
Prahova and Cluj, and in relation to the population of each county, the first places were Teleorman, Tulcea and Arad counties;

- Most hospitalizations belonged to men, with the largest differences between genders being observed in the case of acute duodenal ulcer with perforation and acute gastric ulcer with perforation;
- In terms of patient age, hospitalizations mostly occurred in adults over 40 years of age, with an average age of those hospitalized during this period of 59.26 years, the average age values for the most frequent diagnostic codes at discharge being 64.43 years for gastric ulcer, acute with hemorrhage and 60.07 years for duodenal ulcer, acute with hemorrhage;
- The average length of stay for these patients was 6.78 days, with the highest values observed in 2020 and 2022 (6.98 days and 6.91 days, respectively), and the lowest values recorded in 2024 – 6.60 days. The highest average lengths of stay were recorded for patients admitted for gastrojejunal ulcer, acute

Graph no. 8. Hospitalization episodes, in patients with gastroduodenal ulcer, depending on the patient's age, during the period 2014-2024, at national level



Graph no. 9. Hospitalization episodes in patients with gastroduodenal ulcer, depending on the condition at discharge of the patients, in Romania, during 2014-2024



with both bleeding and perforation (11.8 days), duodenal ulcer, acute with both bleeding and perforation (11.6 days) or gastric ulcer, acute with both bleeding and perforation (11.18 days);

- Three-quarters of patients were discharged in an improved condition or cured (one fifth), while 4.5% died,

and the death rate during hospitalization varied between 2.35% in 2014 and 8.3 in 2021, with deaths occurring mainly in elderly patients (average age 70.4 years) diagnosed with acute gastric or duodenal ulcer with bleeding.

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