



THE ACHIEVEMENTS OF THE CLINICAL PHARMACY UNIT IN JORDANIAN ROYAL MEDICAL SERVICES (JRMS): CRITICAL CARE AND SURGERY DEPARTMENTS' PERSPECTIVE

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ABSTRACT:

The aim of this study is to assess the outcomes of clinical pharmacists' cooperation with the health care providers in Vascular surgery, Neurosurgery, general surgery and ICU departments in Al Hussein Hospital in RMS from January 2022 till December 2022.

Methodology

Design and Patient Selection: For this retrospective study, patients were included from (Jan, 2022 till Dec, 2022). In Vascular surgery, Neurosurgery, general surgery and ICU departments in Al Hussein Hospital in RMS

Data Collection: The clinical pharmacists make a comprehensive review for patients' profile, patients' follow up notes, all relevant lab results and cultures, and all the orders requested by doctors including the medications. Then analyzing the case and give recommendations/ interventions during rounds and document it on the electronic patient's file on a special templates on Hakeem system as Intervention notes.

Results: Participation in medication guidelines and protocol development in association with the Drug Information Center and professional health care team. As Updating the surgical site infection protocol in Vascular surgery Department, and follow up its implementation.

Supervising RMS- clinical pharmacy residents and pharm- D students from Jordan University of Science and Technology and University of Jordan. Also Teaching at Princess Muna College of Nursing.

Participating in the Central Committee of Antimicrobial use management. And Being a member of the Comprehensive Antimicrobial Stewardship Program (ASP) with USAID team.

Being a part of many committees as Scientific Research Consultation Committee, the Higher Committee of Drugs and Therapeutics, the Ethics Committee of Scientific Research, the Scientific Committee of the Directorate of Pharmacy and Medical Supply, and the Board Exam committee. Creating an educational online platform on Microsoft team, to hold online lectures to all RMS- pharmacists in all hospitals.

Conclusions: Inpatient care was generally improved when clinical pharmacist services were added without a risk of harm. The interactions with the medical staff during patient rounds, the patient evaluations, the medication reconciliation, the patient discharge guidance, and the follow-up all contributed to better outcomes.

Keywords: Intervention, clinical pharmacy, health care, provider, neurosurgery.

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INTRODUCTION:

In the early 1960s, the clinical pharmacy movement was born at the University of Michigan (1).

In 1976, Michael et al. provided the first definition of pharmaceutical care as "the care that a given patient requires and receives which assures safe and rational drug usage." (2)

Subsequently, the definition was under development until in 1990 when Hepler and Strand defined pharmaceutical care as "the responsible provision of drug therapy for the purpose of achieving definite outcomes which improve a patient's quality of life". (3) The concept of pharmaceutical care is adopted in clinical pharmacy practice, so

Clinical pharmacy is a health field in which pharmacists give a direct patient care that optimizes treatment therapy, supports health, and disease avoidance. Combining a medical caring with expert knowledge about medications, experiences, judgment, and continuous research to guarantee the best possible patient outcomes.(4)

In the last 50 years, the role of the pharmacist has evolved from a purely dispensary one to one that includes patient-focused clinical services.(5)(6)

In most developed nations, pharmacists have the authority to take on significant positions in pharmaceutical care services.(7) On the other hand, the role of pharmacists in developing nations is moving slowly in the direction of a direct cooperation with other healthcare providers in patient care. They continue to focus primarily on supplying medications rather than providing patient's care. (8,9,10,11,12)

In Jordan, pharmacy school is constantly improving, but the practice is still lagging. Similar to other developing nations, clinical pharmacy services are still provided at the basal level, and the benefits of these services to patients and healthcare systems are not completely recognized. (13)

The Jordanian Royal Medical Services, a significant provider of public health care in Jordan, has a 4-year clinical pharmacy residency program. It provides rotations across all clinical specialties. As well as training in drug delivery and supply (14). The residency program is followed by a Comprehensive Examination (Board of clinical pharmacy) (15) Many of the pharmacists at RMS have PharmD or Msc. of clinical pharmacy degree, they were providing some forms of clinical pharmacy services but not as specialized unit, until January 31, 2022 when The Clinical Pharmacy unit was opened under the patronage of Director General of the Royal Medical Services of Jordan in Al Hussein Hospital.(16) All the

unit members are Msc. of clinical pharmacy or PharmD graduates or have Board of clinical pharmacy. The overall goal of a RMS- Clinical Pharmacy unit is to promote appropriate use of medicines, so: - maximizing the clinical effect of medicines, minimizing the risk of treatment induced adverse events, and maximizing the cost effective use of medicines.

The clinical pharmacist started work in Vascula surgery, Neurosurgery and ICU Departments.

Clinical Pharmacists work closely with the healthcare providers to make the patient's medication regimen as effective as possible, by choosing the proper dosage, frequency, route of administration, length of treatment, strength, and timing of the medication which is the most cost effective choice. And provide the health care team with comprehensive drug related information.

Determine any potential treatment-related issues. As well as participating in Pharmacovigilance documentation. Educate patients/ caregivers about their medications, and assess their compliance to their pharmaceutical care plan. Take part in the development of medication guidelines and protocols. And supervise clinical pharmacy residents and pharm -D students. Documenting the clinical pharmacist notes in Hakeem system as Recommendation/ Intervention notes).

Objective:

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Data Management and Analysis:

The interventions have been classified into 7 main groups, each group has 5 subcategories

1. Adjustment {a. Efficacy, b. Safety, c. Priority, d. Shortages, e. Cautions}
2. Initiation {a. Untreated, b. Efficacy, c. Replacement, d. Counteract, e. Psychological}
3. Replacement {a. Efficacy, b. Availability, c. Safety, d. Convenience, e. Economical}
4. Discontinuation {a. Unnecessary, b. Safety, c. Duration, d. Ineffective, e. Duplication}
5. Monitoring {a. Diagnostic, b. Safety, c. Efficacy, d. Prognosticating, e. Follow-Up}
6. Education {a. Efficacy, b. Safety, c. Non Compliance, d. Psychological, e. Caring}
7. Assessment {a. Patient's Risks, b. Candidacy, c. Adherence, d. Dependency, e. Workflow}

A frequency analysis test on Microsoft Excel Spreadsheet Software was applied to the data to count the occurrence rates of the intervention of interest (IOI). Descriptive statistics was applied to evaluate the results in the form of number and percentages.

RESULTS:

A **4576** Recommendations (Interventions) have been made. The majority of these interventions have been done and discussed with the healthcare providers during the rounds.

The types of recommendations/ interventions and there percentages are shown in (Figure1).

The sub types of each main intervention and its count are shown in (figure 2- figure 8)

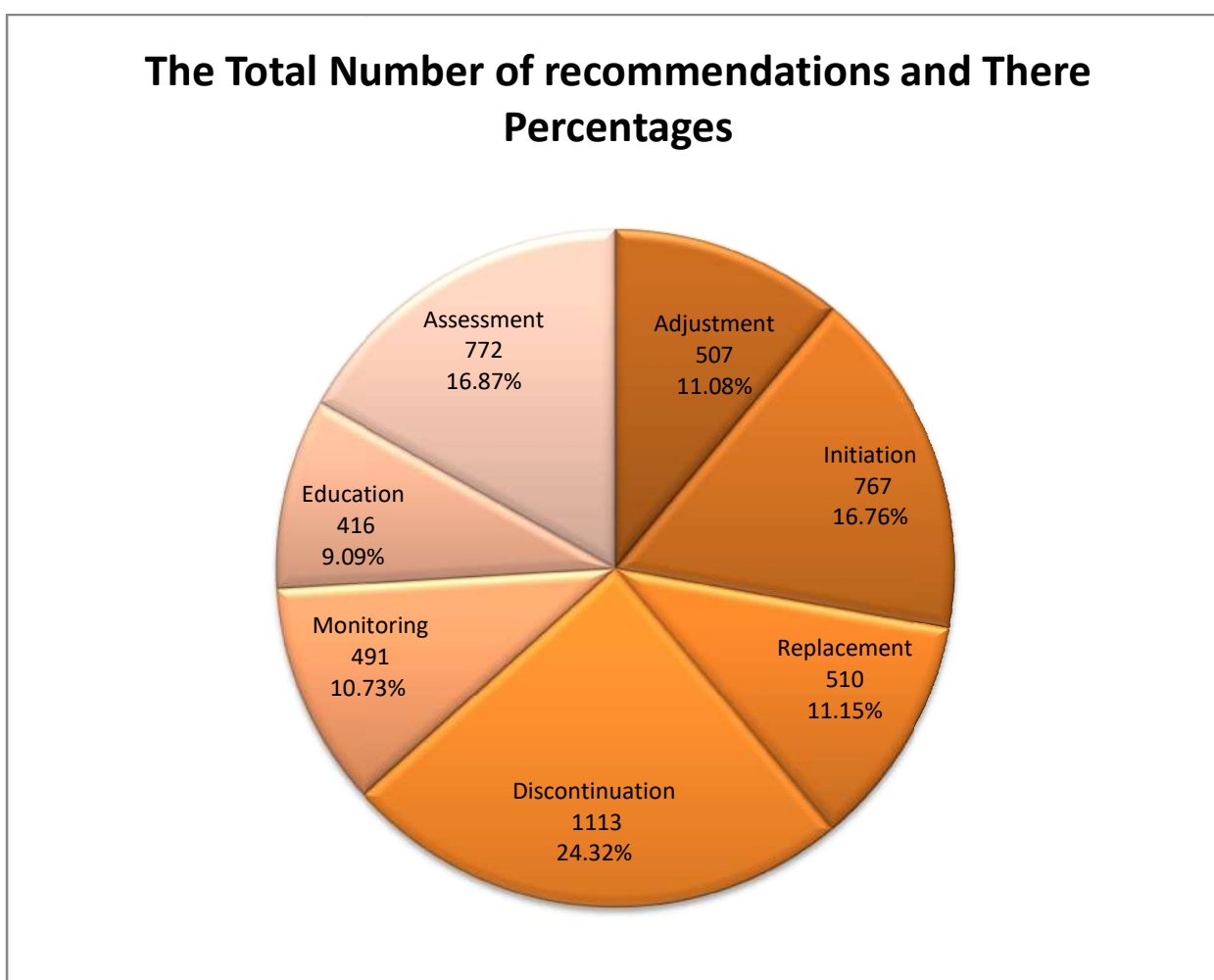


Figure 1: Types of recommendations and there Percentages

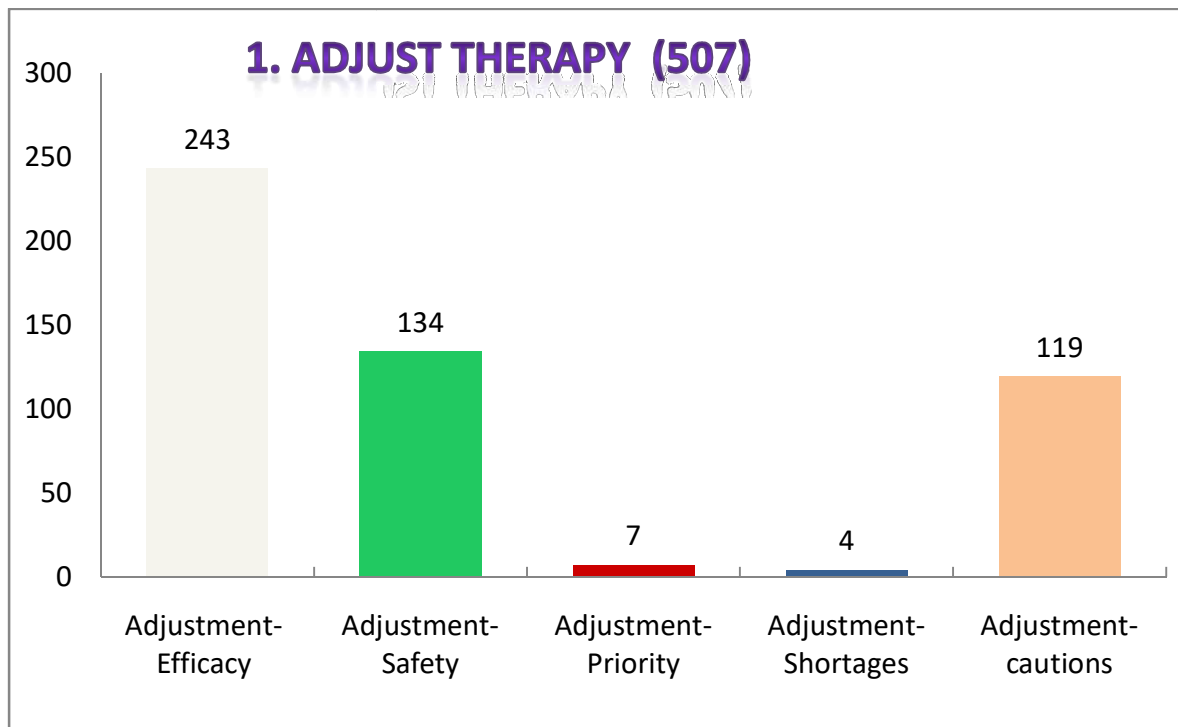


Figure 2: Adjust therapy and its sub types

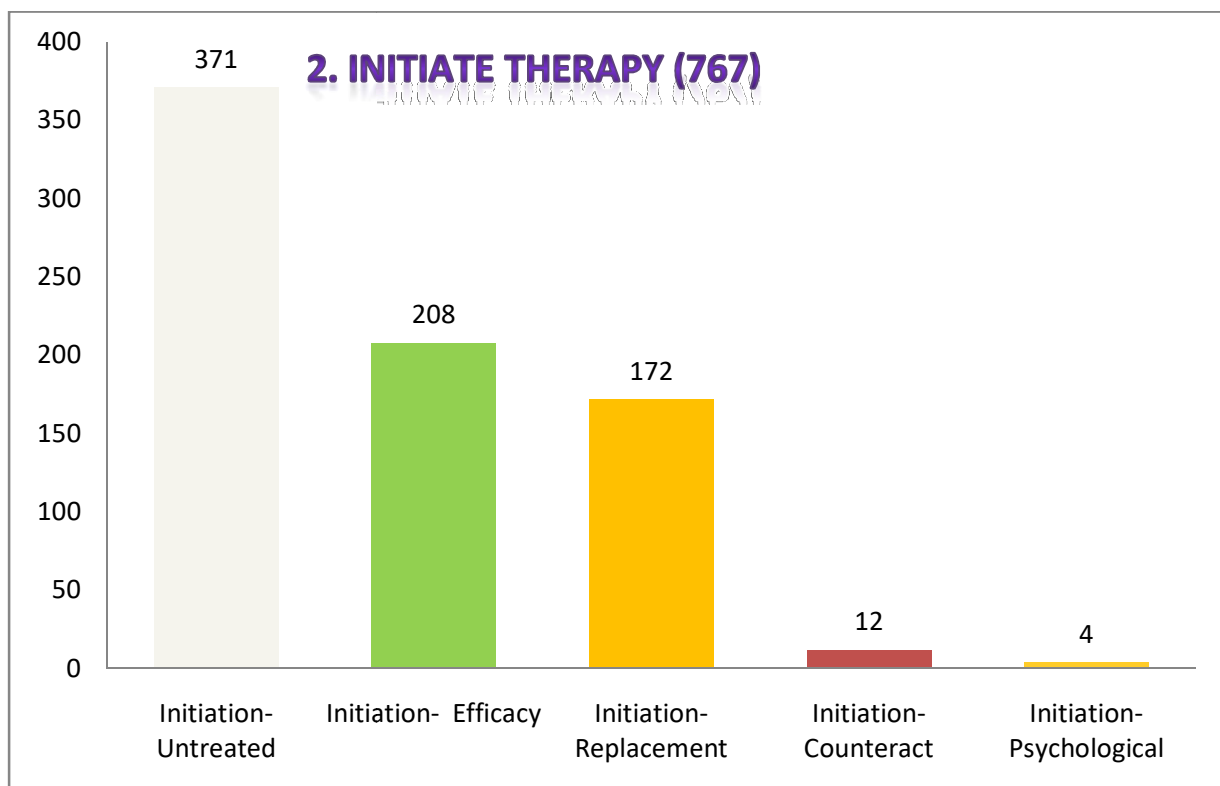


Figure 3: Initiate therapy and its sub types

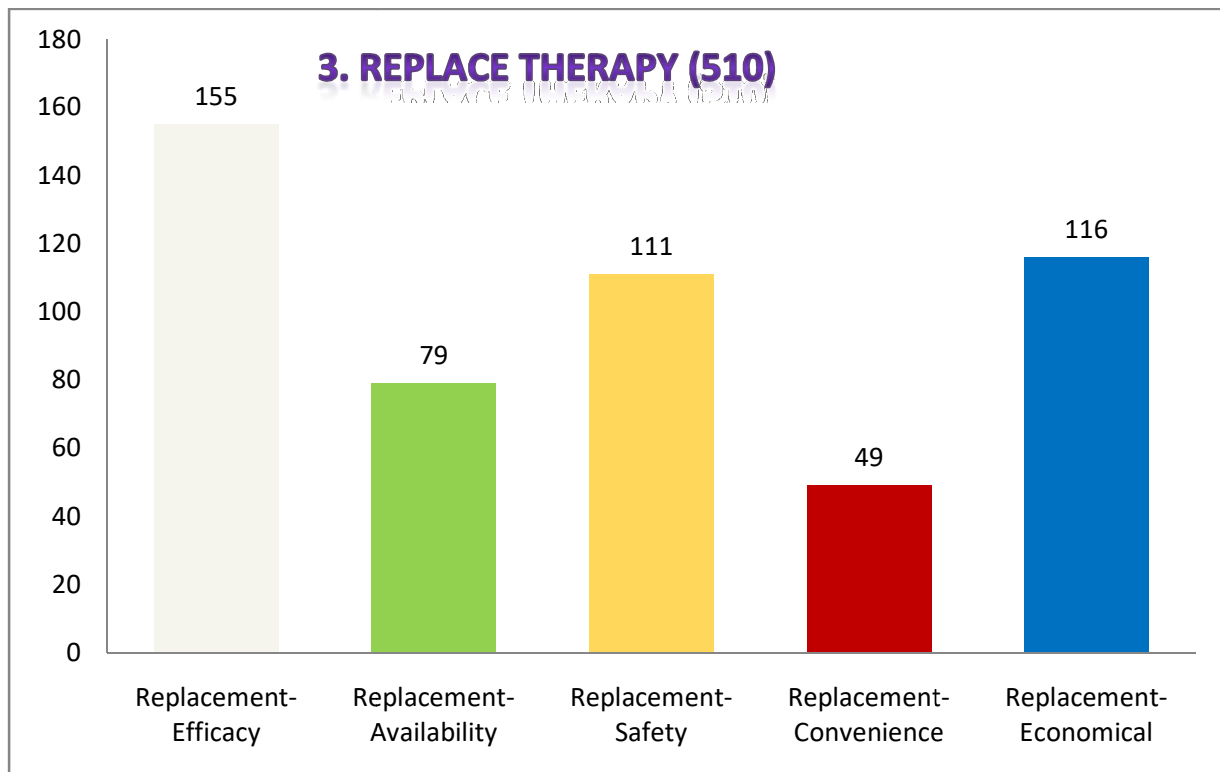


Figure 4: Replace therapy and its sub types

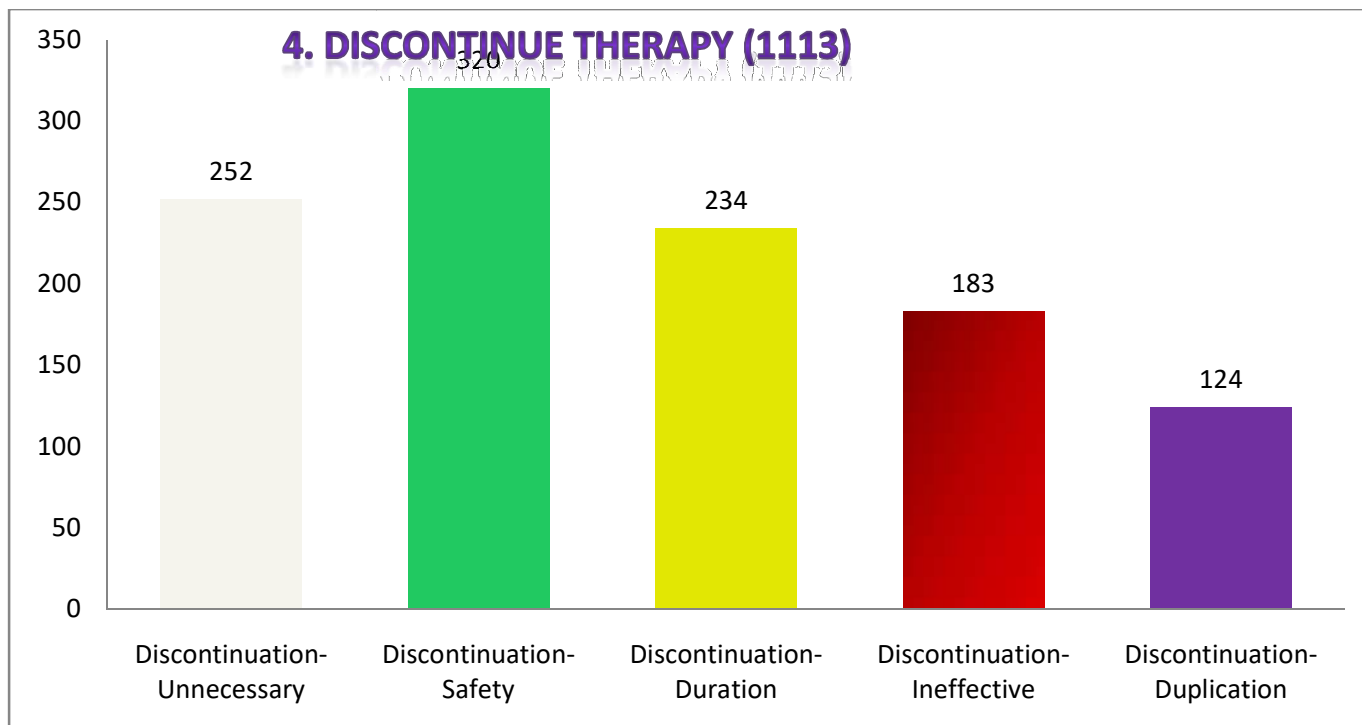


Figure 5: Discontinue therapy and its sub types

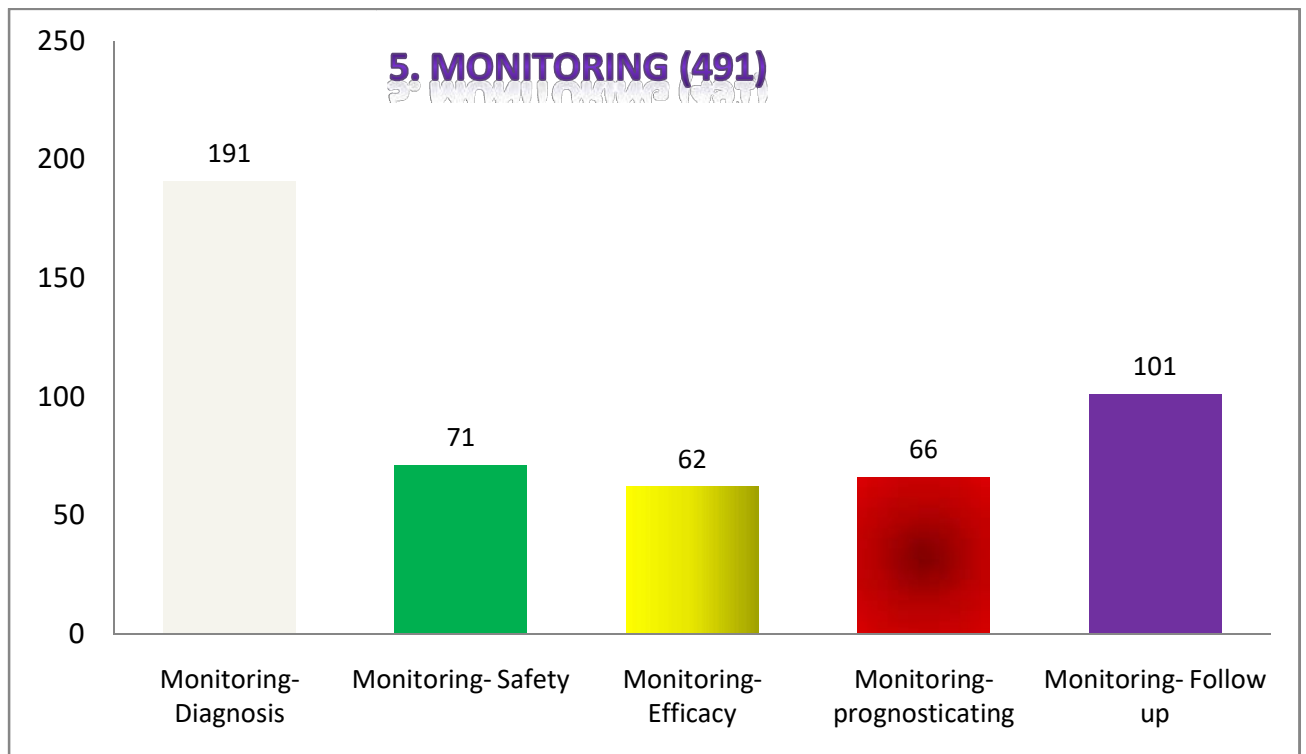


Figure 6: Monitoring and its sub types

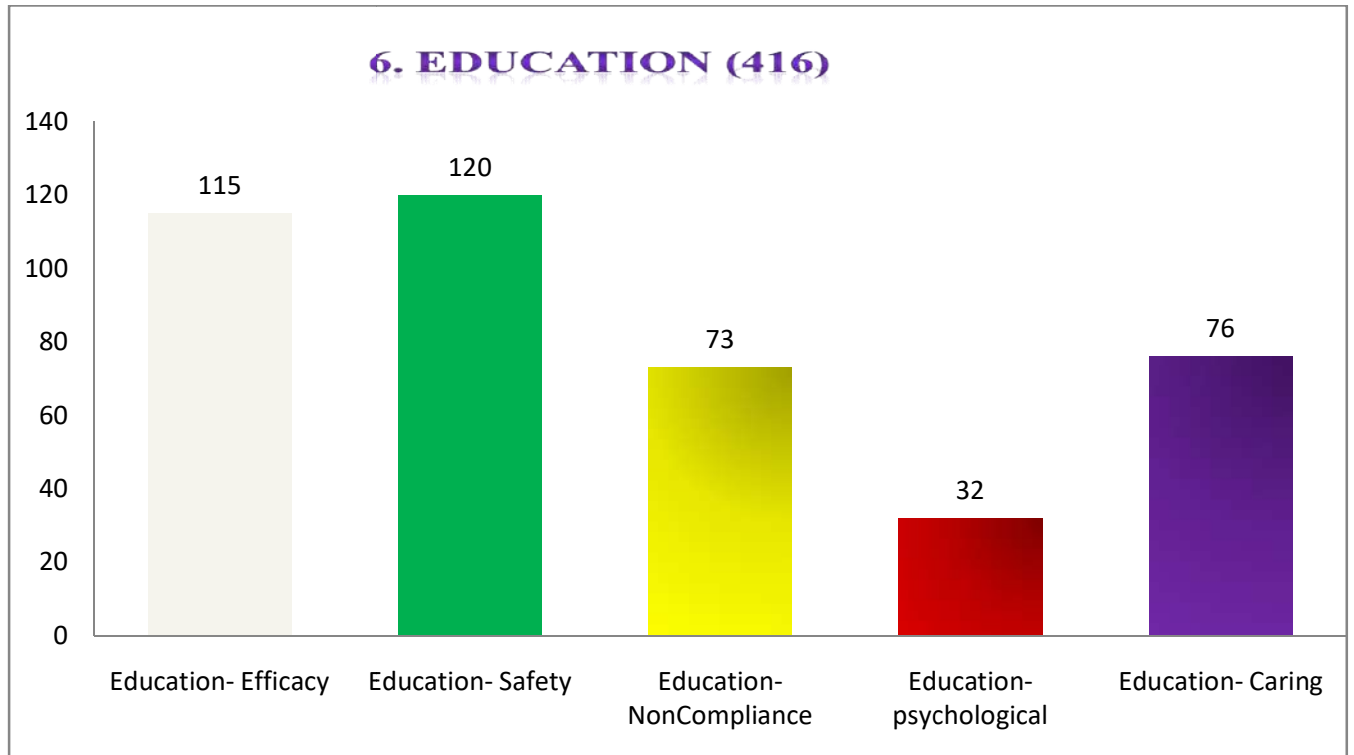


Figure 7: Education and its sub types

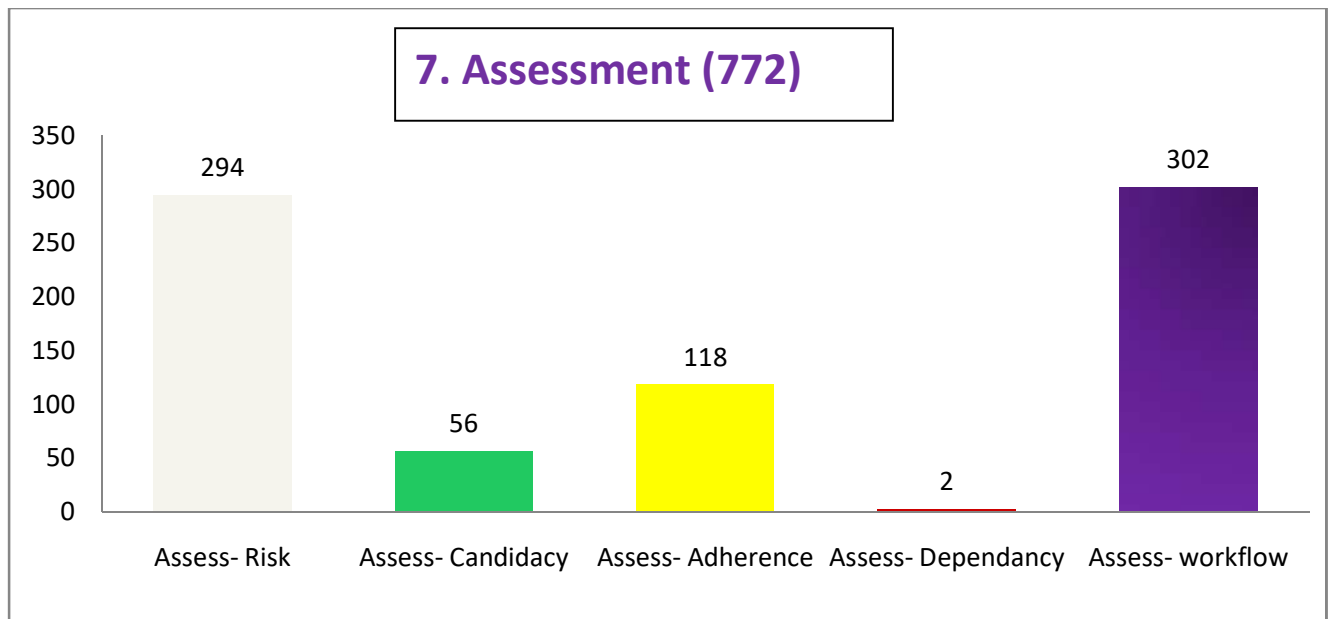


Figure 8: Assessment and its sub types

Our study showed that most of the recommendations were relative to drug discontinuation (1113, 24.32% recommendations). The discontinuation is usually for drugs used without an indication, any unnecessary duplications in the same group, if the drug exceeds the recommended duration of action, also for ineffective drugs, and for safety considerations.

Initiation and Assessment take the second place with (16.76%, 16.87% respectively), initiation include: initiate drug for untreated condition, or initiate drug to increase the efficacy of the treatment regimen, also initiate replacement therapy as electrolytes and minerals, or initiate a medication to counter act the effect of another one, in some cases select a specific needed-medication according to patient preference. The assessment consist of assessing any patient's risk that will affect the care plane (as atherosclerotic cardiovascular risks ASCVR, liver and renal impairment, CAPRINI score, APFEL score.....etc) , assessing if the patient is candidate for specific type of medication and assessing patient adherence to the care plan, also clinical pharmacists assess the whole work flow for physicians, pharmacists and nurses and document the interventions as (reconciliations, transcriptional, storage condition, administrations

errors, error of drug supply and availability of the medications .

The third place is for Replacement and Adjustment with (11.15%, 11.08%), clinical pharmacists make replacement of therapy if it is not effective for the patient condition, or cause side effects. In some cases replacement take place according to the availability of the medications and to encourage the prescriber to use drugs that have same efficacy and side effect profile with less cost. In another cases the replacement is done to use more convenient drugs to the patient and other health care provider.

Adjusting therapy to be more effective (for example adjusting the subtherapeutic doses), or for safety and caution issues (for example adjusting the supra therapeutic doses according to patient status).also may make adjustment according to the availability and priority of medication use.

Monitoring form 10.73% of interventions; clinical pharmacist intervenes to monitor the safety and efficacy of the care plan, also for diagnostic and prognostic and follow up purposes.

Education form 9.09% of intervention, this include educate the patients or their care givers and health care providers about the medications, and assess patient compliance to the drug regimens.

The achievements of the RMS- clinical pharmacy unit are not limited to patients' cases and recommendations, it also include:

1. Participation in medication guidelines and protocol development in association with the Drug Information Center and professional health care team. As Updating the surgical site infection protocol in Vascularsurgery Department, and follow up its implementation.
2. Supervising RMS- clinical pharmacy residents and pharm- D students from Jordan University of Science and Technology and University of Jordan. Also Teaching at Princess Muna College of Nursing.
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CONCLUSION: Inpatient care was generally improved when clinical pharmacist services were added. without a risk of harm. The interactions with the medical staff during patient rounds, the patient evaluations, the medication reconciliation, the patient discharge guidance, and the follow-up all contributed to better outcomes.

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