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*Short communication*

# Role of the hospital pharmacists during COVID-19 pandemic in the RN Macedonia

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## Abstract

Hospital pharmacists played a crucial role during the COVID-19 pandemic, collaborating with healthcare professionals such as nurses, physicians, and respiratory therapists. They contributed to managing COVID-19 treatment protocols, ensuring adequate medication supply, and addressing shortages of essential drugs, medical devices, and personal protective equipment (PPE) by implementing conservation strategies and sourcing alternatives. A questionnaire-based study was conducted among hospital pharmacists in North Macedonia in July 2022, involving pharmacists and pharmacy technicians of various ages and experience levels from five cities, with 95.8% of respondents being female. The results highlighted the pharmacists' knowledge of COVID-19 strains, disinfectants, and current therapeutic options. The study revealed that 37.5% of participants always, 20.8% frequently, and 29.2% occasionally felt depressed or fatigued during the pandemic, though 83% never considered leaving their jobs. The survey found that 87.5% of pharmacists experienced shortages of masks, gloves, and disinfectants early in the pandemic, and 100% noted the increased cost of these supplies. Only 22.7% were not consulted for therapy advice for hospitalized COVID-19 patients. Opinions varied on the use of off-label drugs, and pharmacists played a key role in pharmacovigilance practices, with 36.4% reporting adverse events. The study confirmed the vital role of hospital in promoting of rational antibiotic use and antimicrobial resistance programs.

This study was the first study conducted after the pandemics and have confirmed the pivotal role of hospital pharmacists in this period in the RN Macedonia.

**Key words:** Hospital pharmacist, COVID-19 pandemic, Pharmacovigilance, Drug shortages, Antimicrobial resistance.

## Introduction

Hospital pharmacists played pivotal role during Covid-19 pandemic. As part of the team alongside with nurses, physicians, and respiratory therapists, hospital pharmacists contribute to COVID-19 management protocols, warranting sufficient medication supply by managing critical drug, medical devices or personal protection equipment (PPE) shortages through the implementation of conservation strategies and sourcing alternatives. Hospital pharmacists are as health care professionals are crucial factor in implementation of antimicrobial stewardship programs and are directly involved in planning and responding to pathogen outbreaks. Conducted surveys in many countries have confirmed that they were actively involved in developing local treatment protocols that repurpose antivirals and monitoring the use of antibiotics

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when bacterial co-infections in COVID-19 patients occurred, enabling ration antibiotic utilization as proven therapies experts they actively contribute in critical evaluation of scientific literature, new drug treatments or uses, and provide medication management recommendations to their colleagues. Their expertise has huge importance regarding the off-label use potential treatment options like hydroxychloroquine, methylprednisolone, remdesivir, tocilizumab, favipiravir or ivermectin while there is no current cure for COVID-19. Pharmacists in clinical settings are also very important in the process of evaluation of drug safety, implementation of good pharmacovigilance practices and reporting of suspected adverse events to the relevant competent authorities. In some hospitals pharmacists were actively involved in the conducted clinical trials regarding the treatment follow up or selection and enrolment of eligible patients for these types of studies.

The aim of the conducted study was to evaluate the knowledge, attitudes, and influence/consequences of COVID-19 pandemic on everyday practice of hospital pharmacists as well as to assign their engagement as front-line workers in this period in RN Macedonia.

## Material and methods

The design and structuring of the questionnaire was carried out using focusmethodology group approach. The questionnaire was designed and structured and clarity, complexity and understanding of questions and answers in form of pilot survey were performed in period of one week beginning on 07.07.2022. The final form of questionnaire was distributed as on-line survey between 15.07-28.07.2022 via Google forms platform. The 72 questions were consigned in 2 categories, RN Macedonia pharmacists' sociodemographic characteristics and knowledge, attitudes, engagement and influence/consequences of COVID-19 pandemic on everyday practice of hospital pharmacists. Obtained data were tabulated using Microsoft Excel® (Microsoft Corp. Redmond, WA, USA) and were computed and consequently evaluated using statistical software STATGRAPHICS Centurion XVI evaluation (StatPoint technologies Inc., USA).

## Results and discussion

The survey was completed by 24 hospital pharmacists and pharmacy technicians of whom 95.8% were females. The average age was 45.4±12.9 years. More than 37% have over 20 years practical experience, and 29.2% have 1 to 5 years' experience, 12.5% have 5 to 10 years' and 16.7% have 10 to 20 years' experience. Two third from the respondents are working in public hospitals and one third in private hospitals. Hospital pharmacists from 5 cities in the RN Macedonia responded the survey, and 58.3% were from Skopje, 12.5% form Stip and Struga 8.3% from Bitola and 4.2% from Strumica.

The most (58.3%) of respondents claimed that they spend nearly 2 hours every day in evaluation of available relevant information related to Covid 19, and they claimed that the most commonly used information sources 87.5% were relevant web sites like CDC, FDA, EMA, 83.3% consult the secondary and primary literature, and only 16.7% used social media, TV or radio as relevant information sources during the pandemic. The obtained results confirmed hospital pharmacists' knowledge concerning the clinical manifestation of different COVID-19 strains infection, disinfectants appropriate for COVID-19, as well as up-to-date therapeutic opportunities for patient treatment. Half of the respondent sometimes have concerns regarding possibility of infection at work place, one forth were concerned most commonly, and the other forth were always concerned, but one half were concerned for the transition of COVID -19 infection to their families from the work place. Most of them 37.5%, always 20.8% most commonly and 29.2 % sometimes, felt depressed/tired because of the pandemic, but interesting fact is that over 83% have never considered living the workplace as option.

When evaluating the influence/consequences of COVID-19 pandemic on everyday practice of hospital pharmacists the obtained results were as follows. Two third of the respondents were ill with COVID -19, and out of them 29.4% have claimed that they were infected at work, 35.3% did not know if that was the case and 35.3% denied being infected at work. Almost 71% always use mask at workplace, (62.5% KN 95 mask type and 37.5% surgical mask) and 21% used most commonly, whereas 50% never use gloves at work. 83.3% of hospital pharmacists were working as part of the same team, while half of them were allowed to use vacation in a period determined by the management. One of the important findings is that 2/3 of respondents haven't reduced weekly working hours in order to reduce the risk of exposure to the virus, but 62.5% confirmed staff rotation at the peaks of the pandemic. 87.5% responded that they witnessed a shortage of masks, gloves, disinfectants and antiseptics at the beginning of the pandemic and 100% confirmed the higher economic burden for these supplies. Almost 92% responded that COVID-19 patients were treated at their hospital.

Evaluation of the engagement of hospital pharmacists in COVID-19 pandemic presented interesting findings. Only 22.7% weren't asked for guidance or advice on choosing therapy for hospitalized COVID-19 patients. 18.2% strongly agree and same percentage agree with the statement that they took part in advising on the choice of appropriate therapy in hospitalized patients with COVID-19 who belong to a specific group (pregnant women, geriatric patients, patients with comorbidities), 22.7% partly agree, and the rest 40.9% didn't agree. 27.3% strongly agreed, 18.2% agreed, 18.2% partly agreed, and 27.3% disagreed that they were asked for advice on the proper administration of parenteral therapy to hospitalized

COVID-19 patient. Additionally, 22.7% strongly agreed, 28.7% agreed, 13.6% partly agreed, and 36.4% disagreed that they were asked for guidelines for off-label use of drugs in hospitalized COVID-19 patients (eg. chloroquine, ivermectin, favipiravir). Only 13.6% strongly agreed, 22.7% agreed, 27.3% partly agreed, and 31.8% disagreed that were actively engaged in treatment of hospitalized COVID-19 patients. Hospital pharmacists as literature evaluation experts could help in provision of appropriate scientifically based information, but only 9.1% strongly agree and 22.7% agree that they applied this expertise during the pandemic. Also 36.6% agreed that thy were involved in education for proper PPE and disinfectants/antiseptic use among other HCPs. Almost 59% of hospital pharmacists were not engaged in in risk assessment, screening, triage, detection and reporting of potential cases of COVID-19, unlike in other developed countries. Same percentage agreed and partly agreed (18.2%), whereas 40.9% disagreed that were involved in preparation of standard operating procedures (SOP) related to COVID-19 (eg. use of disinfectants / antiseptics, green corridors, triage, etc.). Nearly half of the pharmacists (45.5) claimed that COVID-19 related clinical trials were conducted in their hospitals, but only 4.5% strongly agreed, and 13.6% agreed and 18.2% partly agreed that were was directly engaged in planning, conducting or documenting the clinical study. Hospital pharmacists are crucial in implementation of good PV practices and 13.6% strongly agreed, 40.9% agreed, 22.7 partly agreed and 22.7% disagreed that were informed of individual cases of adverse events from the prescribed therapy for the treatment of COVID-19, whereas 36.4% strongly agreed, and 13.6% agreed that they report this to the agency. 81.8% of respondents claimed that they have reported AE to the Agency during their practice. This survey has also confirmed the important role of HP in conducting the antimicrobial resistance programs and rational antibiotic use.

## Conclusion

Obtained results from the surveyed population confirmed the pivotal role of hospital pharmacists during the COVID 19 pandemic. This is the first research of this type in RSM and can be a solid basis for further studies.

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**Резиме**

# Улога на болничките фармацевти за време на Ковид-19 пандемијата во Р.С. Македонија

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**Клучни зборови:** Болнички фармацевт, пандемија COVID-19, фармаковигиланца, недостиг на лекови, антимикробна ресистенција.

Болничките фармацевти одиграа клучна улога за време на пандемијата COVID19, соработувајќи со здравствените работници како што се медицинските сестри и лекарите. Тие придонесоа за управување со протоколите за лекување COVID-19, обезбедување на соодветно снабдување со лекови и справување со недостигот на есенцијалните лекови, медицински средства и опрема за лична заштита, преку имплементирање на стратегии за зачувување и алтернативни извори за набавка. Студија заснована на прашалници беше спроведена меѓу болничките фармацевти во Северна Македонија во јули 2022 година.

Во студијата беа вклучени фармацевти и фармацевтски техничари од различни возрасти и нивоа на искуство од пет градови, при што 95,8% од испитаниците беа жени. Резултатите го истакнаа знаењето на фармацевтите асоцирани со COVID-19 соевите, средствата за дезинфекција и актуелните терапевтски опции. Студијата откри дека 37,5% од учесниците секогаш, 20,8% често и 29,2% повремено се чувствувале депресивно или уморно за време на пандемијата, иако 83% никогаш не размислувале да ги напуштат своите работни места. Истражувањето покажа дека 87,5% од фармацевтите се соочиле ис е спавувале со недостиг на маски, ракавици и средства за дезинфекција на почетокот на пандемијата, а 100% забележале зголемени трошоци за овие залихи.

Само 22,7% не биле консултирани за совети за терапија за хоспитализирани пациенти со COVID-19. Идентификуавни се разлики во ставовите за offlabelупотребата на лековите. Фармацевтите исто така одиграа клучна улога во имплементирањето на добрите практики на фармаковигиланца, при што 36,4% од испитаниците потврдиле дека пријавиле несакани настани од употребата на лековите. Ова студија исто така ја потврди виталната улога на болничките фармацевти во промовирањето на рационална употреба на антибиотици и програмите за антимикробна резистентност.

Оваа студија беше прва студија спроведена по пандемијата и ја потврди клучната улога на болничките фармацевти во овој период во Република Северна Македонија.