



THE ROLE OF PHARMACEUTICAL CARE IN IMPROVING PUBLIC HEALTH SERVICE DURING THE COVID-19 PANDEMIC

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Abstract:

Background: Pharmacists play a crucial role as accessible and trustworthy healthcare professionals, particularly in community settings. The importance of clinical pharmacists in ensuring safe medication use has been increasingly recognized. However, the COVID-19 pandemic has significantly impacted pharmacists' roles and health status, leading to challenges such as increased infection risks, work disruptions, and mental health issues. **Objective:** This research aims to assess the impact of pharmaceutical care interventions on managing and preventing COVID-19 in the community, evaluate the effectiveness of pharmaceutical care services in improving public health outcomes during the pandemic, investigate pharmacists' role in promoting public health education related to COVID-19, and identify barriers and facilitators to implementing pharmaceutical care services in public health settings during the crisis. **Conclusion:** Despite facing various challenges during the pandemic, pharmacists have demonstrated resilience and adaptability in providing essential pharmaceutical care services. They have played a critical role in managing and preventing COVID-19, promoting public health education, and collaborating effectively with medical teams. Through remote patient interactions and creative solutions in hospitals, pharmacists have ensured the safe and effective use of medications, contributing significantly to safeguarding public health and enhancing patient outcomes during these unprecedented times. Recognizing and supporting the invaluable contributions of pharmacists is crucial for navigating through the ongoing global health crisis effectively.

Keywords: pharmaceutical care, pharmaceutical services, pharmaceutical practice, public health, COVID-19, pharmacist, pharmacy, healthcare

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Introduction:

Among healthcare professionals, pharmacists are commonly viewed as the primary point of contact for patients within the healthcare system, esteemed for their accessibility and reliability, and they regularly interact with patients as they adhere to prescription dispensing schedules [1]. Situated ideally within communities, pharmacists have the opportunity to engage in a wide array of health promotion initiatives and services. Furthermore, the significance of clinical pharmacists in healthcare environments has been increasingly acknowledged in recent years. These specialized professionals play a pivotal role in ensuring the safe and effective utilization of medications among hospitalized patients [2].

The concept of pharmaceutical care emerged post-1990, with a focus on patient-centered activities by pharmacists aimed at delivering appropriate therapies that yield safe therapeutic outcomes and enhance quality of life. Consequently, the conventional role of drug preparation and development has gradually transitioned towards pharmaceutical services that prioritize patients' needs and the nuances of their medical conditions. However, the onset of the current pandemic has disrupted the operations of various professional sectors, including pharmaceutical activities, profoundly impacting the practice of pharmacists [3]. Pharmacists are widely regarded as the most accessible healthcare professionals who bolster medical practice. Bragazzi et al. outlined the diverse roles of community or hospital pharmacists, including their expertise in medications, healthcare provision, education, counseling, mentoring, management, leadership, business development, research, and more [4].

Pharmacists represent a valuable human asset, deeply ingrained within their communities. Leveraging their professional training and scientific expertise, they are equipped to furnish accurate and comprehensive medical guidance to the populace. Throughout the pandemic, pharmacists have remained at the forefront to assist patients and mitigate the effects of infections. During this period, the practice of pharmacy has evolved, with some scholars suggesting that it has entered a "new era" [5].

Objectives:

The main objectives of this review are:

1. To assess the impact of pharmaceutical care interventions on the management and prevention of COVID-19 in the community.

2. To evaluate the effectiveness of pharmaceutical care services in improving public health outcomes during the COVID-19 pandemic.
3. To investigate the role of pharmacists in promoting public health education and awareness related to COVID-19 prevention and management.
4. To identify barriers and facilitators to the implementation of pharmaceutical care services in public health settings during the pandemic.

COVID-19 Influences on Pharmacists' Health Status:

Pharmacists, as essential workers, faced heightened risks of contracting SARS-CoV-2 through various avenues such as direct patient interactions, interactions with suppliers, commuting on public transport, and handling paper-based prescriptions. Concerns about the impact of COVID-19 on their personal and professional lives were prevalent among pharmacists, as highlighted by Ashiru-Oredope et al. [6].

Several challenges were identified across European countries during the pandemic, including staff reassignments, holiday cancellations (e.g., in England), activity restrictions in community pharmacies (e.g., in Croatia), limited access to staff testing, difficulties in maintaining staff distancing, and inadequate access to electronic resources for remote work. Issues such as insufficient knowledge about drug use in COVID-19, low availability of quality disinfectants, and improper usage practices were reported in Romania and Turkey, all of which can have implications on health outcomes [7,8].

Studies have also pointed out that the fear of workplace infections was a significant stressor for pharmacists and their families during the pandemic. Factors such as fatigue, burnout, stress, anxiety, and communication challenges with colleagues were identified as key risks affecting pharmacists' well-being [9,10]. Research on the health-related quality of life of community pharmacists in Romania and Bulgaria during the pandemic revealed lower quality of life levels among Bulgarian pharmacists, particularly in areas such as sleep, mental function, depression, and distress. Novak et al. [11] also noted a sense of dissatisfaction among Serbian pharmacists regarding public perceptions of their role.

In April 2020, the Canadian Pharmacists Association (CPhA) reported that over 70% of pharmacists experienced increased harassment from patients since the onset of the pandemic, including verbal and other forms of abuse [12]. Ebeldini et al. highlighted instances of anti-Asian racism and physical abuse faced by pharmacists in

the USA, UK, and France, impacting their well-being. Professional associations like the CPhA took steps to disseminate information through various media channels to support pharmacists' mental health [13,14]. Furthermore, authorities in Wyoming, USA, established online support groups to assist pharmacists and other healthcare professionals in coping with the mental strains caused by the pandemic.

Pharmaceutical Care in Community Pharmacies:

During the COVID-19 pandemic, community pharmacists were integrated into the public health team to enhance the fight against the virus. A study in Saudi Arabia revealed that all surveyed pharmacists were adequately prepared for this crucial role [15]. Pharmacists were tasked with making decisions aimed at reducing patient visits to pharmacies or doctors and minimizing the risk of infection.

Visacri et al. outlined the key responsibilities of pharmacists during the pandemic, which included prevention and infection control, procurement, storage, and distribution of personal protective equipment (PPE) and medications, patient care, and support for healthcare professionals [16]. Furthermore, Bragazzi et al. emphasized the significant contributions of pharmacists in screening, triage, detection, reporting of potential COVID-19 cases, active surveillance, early alerts on drug shortages, telepharmacy services, combating misinformation about COVID-19 medications, among other essential tasks [17]. Elbedini et al. also recognized the role of pharmacists in conducting physical assessments, monitoring blood pressure, fever, and performing COVID-19 testing [18].

Saudi Arabia stood out for having one of the most advanced healthcare systems during the pandemic, with pharmacists playing a pivotal role in the country. Ahmad et al. identified various services provided by community pharmacists in Saudi Arabia, including disseminating public information, offering patient counseling (particularly online counseling for individuals in lockdown), delivering and monitoring treatments, preventing drug misuse, managing chronic diseases, and reporting suspected COVID-19 cases [19].

Clinical Pharmacists' Roles in COVID-19 Pandemic:

During the COVID-19 pandemic, clinical pharmacists have been actively involved in various

essential roles to support patient care and optimize medication management. These roles include addressing therapeutic issues such as identification, prevention, and treatment, providing therapeutic alternatives for out-of-stock drugs, conducting patient counseling including medication reviews through phone or video conferences, offering information on new therapies and the safety profiles of drugs like ibuprofen, glucocorticoids, ACEIs, and BRAs. Additionally, clinical pharmacists have contributed to clinical study teams, collaborated with healthcare professionals to develop clinical guidelines on dosage, precautions, interactions, adverse drug reactions, contraindications, and special risk categories. They have also played a crucial role in educating nurses and paramedic staff on medication issues, reporting adverse drug reactions, proper personal protective equipment (PPE) usage, and handling patient samples [20].

Furthermore, clinical pharmacists have been instrumental in preventing COVID-19-related stigma by addressing negative behaviors and language while providing psychological counseling. They have also actively participated in antimicrobial stewardship efforts, working closely with microbiology laboratories to assess COVID-19 tests, monitor patient compliance, develop and implement protocols for antiviral and other drug use, manage drug shortages, and explore new treatment options for the infection.

Despite the challenges posed by the pandemic, clinical and hospital pharmacists have adapted to the changing healthcare landscape. McConchie et al. noted a decrease in patient numbers and an increase in intensive care unit admissions, leading to disruptions in drug orders and prescriptions. Clinical pharmacists have also experienced changes in their work environment, with some being relocated from operatory rooms to pharmacies. However, there has been an uptick in medication reviews and the preparation of intravenous compounded drugs, with a focus on medications commonly used in COVID-19 treatment such as fentanyl, midazolam, azithromycin, hydroxychloroquine, enoxaparin, propofol, and neuromuscular blockers [21].

Collaboration with the Medical Team:

During a crisis like the ongoing COVID-19 outbreak, the presence of pharmacists within healthcare teams is crucial. Since the onset of the pandemic, pharmacists have played a pivotal role in various aspects of patient care. They have been instrumental in developing emergency drug formularies, creating therapeutic plans, and

compiling documents containing essential information about medications used in the treatment of COVID-19, all aimed at supporting the work of physicians [22]. Moreover, pharmacists have actively participated in medical teams dedicated to managing COVID-19 patients with underlying health conditions, contributing their expertise to assess and optimize treatment regimens [23].

In addition to their involvement in treatment planning, pharmacists have been vigilant in monitoring and managing adverse drug reactions (ADRs) and drug interactions, particularly in critically ill patients or those receiving medications with a narrow therapeutic index. They have been tasked with ensuring the appropriate use of off-label medications and closely monitoring for potential ADRs, adjusting dosages as necessary based on individual organ function and damage. Collaborative pharmacological discussions within medical teams have been facilitated through alternative communication channels such as video conferences or messaging platforms like WhatsApp, with therapeutic decisions being made in consultation with pharmacists [24].

One notable example of collaboration between clinical pharmacists and medical teams in the context of COVID-19 treatment is exemplified by a proposal put forth by a clinical pharmacist at the intensive care unit of the University Hospital of Amiens in France. This proposal involved the pulmonary administration of interferon- β -1b via nebulization, a strategy that yielded positive outcomes for four patients who had previously shown no response to other treatments. The study conducted by Mary et al. demonstrated a favorable clinical evolution in these patients following interferon administration, highlighting the valuable contributions of pharmacists in optimizing treatment outcomes [25].

Pharmacists Role in Achieving Remote Patient Interaction:

During the pandemic, pharmacists demonstrated their ingenuity by adopting various forms of remote communication with patients and medical teams, such as utilizing telephone, WhatsApp, FaceTime, Skype, written interactions via website-based or Internet platforms (e.g., Pharmadoctor eTool in the UK), video conferences, and even television and radio broadcasts to disseminate information aimed at reducing anxiety and enhancing treatment adherence [26,27]. The evolution of telepharmacy, a concept introduced a few years back to deliver hospital pharmacy services, gained prominence during the COVID-19 crisis. For instance, the

utilization of the Clinical Pharmacist helpline service within an Inflammatory Bowel Disease unit surged by 228% in comparison to the pre-pandemic era. In Spain, hospitals swiftly implemented online counseling and home drug-delivery services (facilitated by external couriers or the hospitals' own transport services) in response to the Coronavirus outbreak, leading to a notable increase in the number of patients benefitting from telepharmacy services. Notably, despite the shift to online communication, all interactions adhered to established face-to-face protocols, with pharmacists' interventions meticulously documented in patients' electronic medical records [28].

Furthermore, findings from a study conducted at a cardio-oncology clinic underscored the role of clinical pharmacists in a virtual hybrid model, collaborating with the medical team through discussions and medication management, encompassing reviews, education, addressing drug interactions, and dosage adjustments in the context of cardiovascular diseases and smoking cessation [29]. Nevertheless, challenges related to limited internet access for both patients and pharmacists were highlighted, underscoring the hurdles encountered in facilitating seamless communication channels.

Pharmacists Role in Achieving Creative Solutions in Hospitals:

Pharmacists disseminated information about the COVID-19 issue, regardless of the location of pharmaceutical care. Temporary ambulatory pharmacies were established to provide medication for patients with fever or suspected COVID-19 cases. Additionally, Fangcang hospitals were set up to accommodate patients. Pharmacists working in traditional hospitals or Fangcang shelter hospitals were adept at providing tailored, accurate, and comprehensive information based on each patient's level of comprehension. This information was communicated through various media channels such as TV, Twitter, Internet, YouTube, radio from Fangcang hospitals, and online remote pharmacies [30,31]. Furthermore, Goff et al. highlighted the efforts of a pharmacist from the Ohio State University Wexner Medical Center in Columbus, who conducted over 20 interviews with local television health reporters, national news media, and various magazines to educate the public about COVID-19 [32].

Pharmacists utilized a mobile phone application to monitor anticoagulant therapy and optimize warfarin doses for 500 patients. Elbedini et al. also proposed an innovative solution to address the

shortage of pressurized metered-dose inhalers with salbutamol by repurposing partially used inhalers to treat multiple patients [33].

Conclusion:

In conclusion, this research article highlights the critical role of pharmacists in the management and prevention of COVID-19 within the community and healthcare settings. Despite facing numerous challenges and risks during the pandemic, pharmacists have shown resilience and adaptability in providing pharmaceutical care services, promoting public health education, and collaborating effectively with medical teams. Their efforts in achieving remote patient interactions and implementing creative solutions in hospitals have been instrumental in ensuring the safe and effective use of medications during these unprecedented times. Moving forward, it is essential to recognize and support the invaluable contributions of pharmacists in safeguarding public health and enhancing patient outcomes amidst the ongoing global health crisis.

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