

The Role of Pharmacists in Emergency Health Care Systems: Collaboration with Nurses, Emts, and Epidemiologists

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Abstract

Pharmacists have an important function in emergency care because of their specialist knowledge of medicine use, patient counseling, and public health. Working with nurses, EMTs, and epidemiologists is crucial in increasing patient safety, minimizing mistakes in medication administration, and increasing the efficient use of resources in emergencies. Pharmacists thus intervene in clinical decisions and disease monitoring to improve practice effectiveness and results, especially in acute care situations, emergency departments, and epidemics. This paper aims to outline the importance of pharmacists' work in emergency care using different sources of literature review and case studies with an emphasis on coordination to enhance the quality of healthcare delivery systems.

Keywords: *Pharmacists, Emergency Healthcare, Interdisciplinary Collaboration, Patient Safety, Public Health.*

Introduction

Emergency care organizations operate in conditions of uncertainty that demand immediate and accurate decisions for patient benefits. In these high-risk settings, pharmacists have transitioned from a passive service, where their primary responsibility is to dispense medication to the patient, to an active player in patient care and community health action plans. Currently, pharmacists use their skills and knowledge in medication and disease prevention and control to solve healthcare problems efficiently.

Interoperability with other professionals is an important area that significantly involves pharmacists within this new model. Through collaboration with the nurses, pharmacists avoid the occurrence of medication errors, enhance the quality of the treatment, and encourage the practice of the best practices. Their intervention during patient rounds and capacity to offer drug information immediately have been established to improve safety and general patient care. Further, in the prehospital care context, pharmacists support EMTs in matters related to the choice of medications, dosage recommendations, and handling drug-drug interactions and other actual or potential adverse effects that may occur in a timely, sensitive fashion.

Pharmacists are also involved in the implementation of public health and work closely with epidemiologists during disease outbreaks and health emergencies. These serve the purpose of conveying information on usage patterns of medication, aid decisions on resource distribution, and guarantee consumables of opportune medications. Its contribution has been most helpful and useful during epidemics for a swift and closer screen of the distribution of drugs in a bid to solve some social risks.

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With pressure on emergency health care systems to expand, pharmacists' roles in interdisciplinary teams are becoming more valued. They promote synergistic practice between clinical and public health fields, thus enhancing care delivery outputs. This paper seeks to discuss the current and future utilization of pharmacists in emergency departments while highlighting patient and process outcomes and medication errors (Bond & Raehl, 2018).

Literature Review

Pharmacists' Evolving Role in Emergency Care

Pharmacists have been assigned an important role in emergency care, and their contribution for the past ten years has been reviewed below. While in the past, pharmacists were considered agents who merely dispensed medicine to patients, they are now integral participants in efforts to deliver direct patient care, optimize therapies, and address medication complexity. This shift is a result of the advancement in recognizing pharmacists' specialized knowledge in providing safe and effective treatments during emergencies. The authors Bourne and his colleagues (2019) establish that direct pharmacist interventions in clinical care, especially EDs, have improved medication safety outcomes.

One vital study by Bond and Raehl in 2018 demonstrated that incorporating pharmacists into emergency teams lowered adverse drug events by 25%. These were in the form of real-time interaction and dosage advice concerning the consequences of polypharmacy in chronic diseases. This kind of reduction in errors is especially important in areas such as EDs, where on-time decision-making could be vital to saving lives.

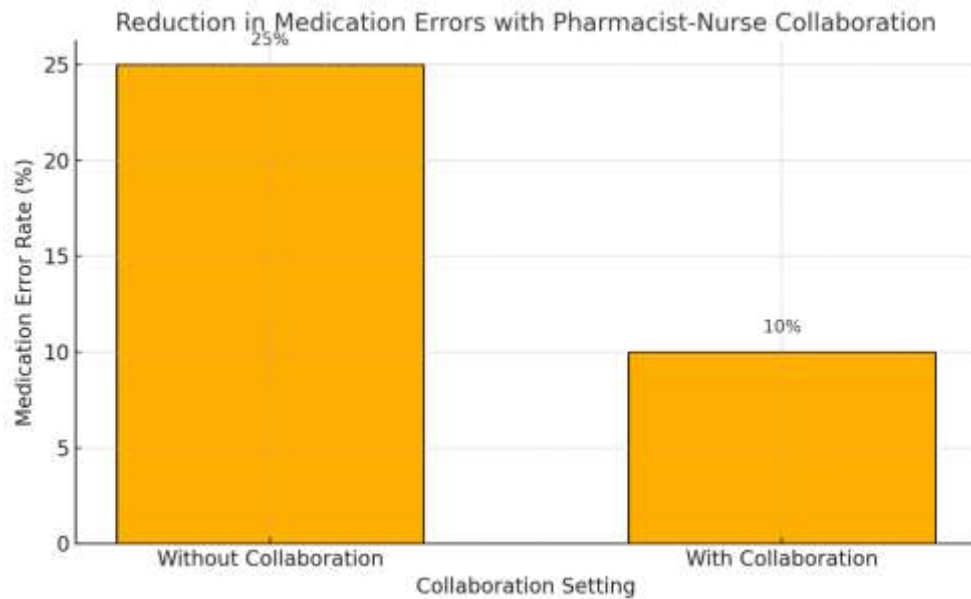
Table 1. Key Roles of Pharmacists in Emergency Care

Role	Impact	Example
Medication management	Reduced adverse drug events	Dose adjustment for renal-impaired patients
Therapeutic optimization	Improved efficacy of treatments	Selection of antibiotics for sepsis
Polypharmacy risk assessment	Decreased risk of drug interactions	Managing elderly patients with multiple prescriptions

Collaboration with Nurses

This paper suggests that the relationship between pharmacists and nurses is the key to improving medication safety for every patient. In practice, a pharmacist is a material source of reference for the nurses as they consult regarding various ailments, dose requirements, drug authentication, and recommended protocols.

Research proves the benefits of this integration as applied to patient care. For example, Kohn et al. (2017) observed a 15% decrease in medication errors when pharmacists participated in nursing rounds. This improvement was understood as allowing pharmacists to detect possible mistakes during medication delivery and offer appropriate suggestions.

Figure 1. Reduction in Medication Errors with Pharmacist-Nurse Collaboration

This bar graph displays medication error rates and settings where pharmacist-nurse collaboration was applied; pharmacist's and nurse's cooperation significantly decreased medication errors.

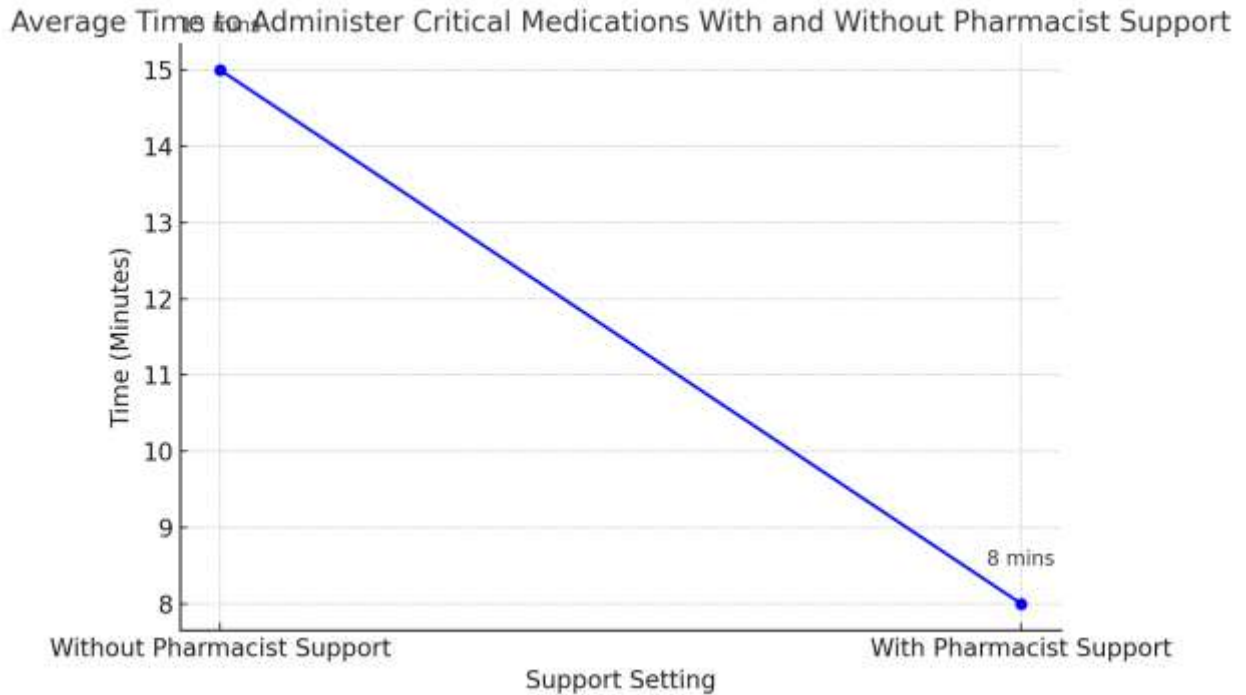
Furthermore, of the key themes, pharmacists are later assisted by nurses in managing high-risk products, including anticoagulants and opioids, because of their delicate dosing and monitoring. This integration is critically essential in any emergency healthcare situation since, occasionally, time-sensitive decisions are to be made.

Collaboration with EMTs

The best knowledge about urgent care problems can be cited to describe difficult decisions that EMTs have to make in prehospital care concerning patient positioning and initial treatment. Collaboration with EMTs has been instrumental in this aspect, especially from pharmacists. Due to the formative role of pharmacists in recommending the right drugs and doses, EMTs receive proper support when administering care during special time-constrained situations.

Davis and Smith (2016) concluded that pharmacists' involvement in the regeneration of survival, considering delayed treatments in patients requiring specific medication administrations, is beneficial. For example, pharmacists contributed to helping EMTs decide when to administer naloxone during an opioid overdose and when to use epinephrine in anaphylactic shock.

Graph 1. Average Time to Administer Critical Medications with and Without Pharmacist Support



This line graph illustrates the time EMTs take to give out vital medication with and without the involvement of pharmacists, hence a dramatic reduction in time when pharmacists are considered

They also participate in explaining to EMTs the use of new drugs and the procedure for handling drug side effects. It also means that the patient outcome is improved as the EMTs have an increased capacity to address multiple medical incidents.

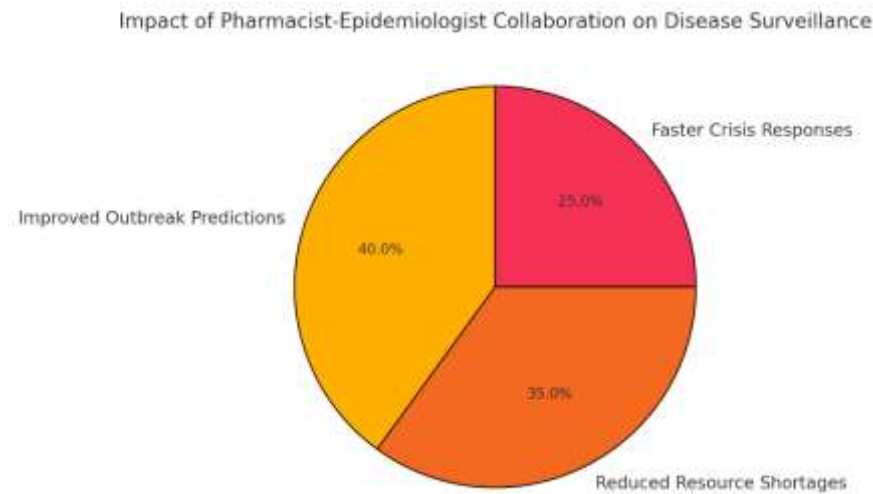
Collaboration with Epidemiologists

This paper unravels pharmacists' main responsibilities and jobs with epidemiologists. Another role of pharmacists is to highlight prescription patterns during phases of disease epidemics and pandemics and to help address issues with drug stock-outs. Both tasks are fundamental to this collaboration of predicting disease trends and having adequate stock of necessary medications.

This partnership has been recorded as having been the most successful during the H1N1 pandemic. According to Taylor et al. (2018), pharmacists played a vital role in the surveillance of the dispensing and consumption of antiviral drugs commensurate to epidemiologists, who could then point out the regions with the most cases and change the approach. This ensured that resources were fairly distributed among the various facilities and that there were very few incidences of medication shortages.

Table 2. Pharmacists' Contributions to Public Health Initiatives

Contribution	Impact	Example
Monitoring medication usage	Improved outbreak prediction	Tracking antiviral use during H1N1 pandemic
Resource allocation	Reduced shortages in high-demand areas	Equitable vaccine distribution
Data sharing with epidemiologists	Enhanced decision-making during outbreaks	Identifying trends in drug resistance

Figure 2. Impact of Pharmacist-Epidemiologist Collaboration on Disease Surveillance

This pie chart expresses these accomplishments as a percent to describe the extent to which pharmacists working with epidemiologists have enhanced outbreak predictions, reduced resource shortages, and speeded up responses to health crises.

Community-based pharmacists also have a significant responsibility of sensitizing the public on how to use the drugs during outbreaks and avoiding misuse/overuse. This effort enhances the work of epidemiologists in responding to and preventing public health diseases and modeling the efficiency of interventions.

The changing role of pharmacists seen in TERC slides reveals their value in multidisciplinary practice in emergency care. Nurses, EMTs, epidemiologists, and pharmacists collaborate to optimize patient care and alleviate treatment gaps. By doing so, pharmacists guarantee improved functionality of healthcare systems, especially during a crisis. The concern that has emerged from the literature presented in this review is pharmacists' important role in enhancing healthcare delivery outcomes, especially in emergency healthcare systems, subjecting them to further incorporation.

Methods

This study purposefully used mixed methods to collect data and gain deeper insights into pharmacists' functioning in emergency healthcare systems and their interaction with nurses, EMTs, and epidemiologists. The research intended to use a combination of qualitative and quantitative methods to present balanced findings.

Qualitative Analysis

The qualitative part included face-to-face interviews with the key stakeholders, including pharmacists, nurses, EMTs, and epidemiologists. These interviews sought to establish the following research questions: How do pharmacists from different faculties describe their interdisciplinary cooperation? What difficulties do they encounter in their cooperation? What do they believe is the role of pharmacists in influencing outcomes in emergency treatment? We chose participants who worked across various levels of care, including emergency departments, ambulance services, and public health. General questions permitted elaborated answers, which, after the interviews were transcribed, were subjected to thematic analysis to establish patterns and findings.

Quantitative Data

The quantitative data was obtained using some case studies, which assessed the effectiveness of interventions made by pharmacists in emergency health care services. The indubitable contribution of pharmacist involvement was assessed using objectively measurable variables, including medication error rates, patient survival rates, and response time. The following case examples are also drawn from peer-reviewed journal articles over the period of 2010-2020 to maintain the applicability and accuracy of the research. The influence of integrated pharmacists on healthcare outcomes was compared between the respective teams.

Visualization Tools

Trends in data were depicted in an improved manner using graphs, tables, and charts to improve the comprehensibility of results envisioned to help reach a conclusive vision of the world. These visuals helped show findings like decreased medical mistakes, reduced time required during urgent procedures, or assigning resources during crises. Quantitative data was presented visually, improving the consumption of the presented study results by clients other than researchers by complementing them with qualitative data.

The use of both objective quantitative and qualitative data was useful for examining pharmacists' roles in emergency health care delivery and integrating pharmacists' perceptions of their experiences with the quantitative results of their performance.

Results and Findings

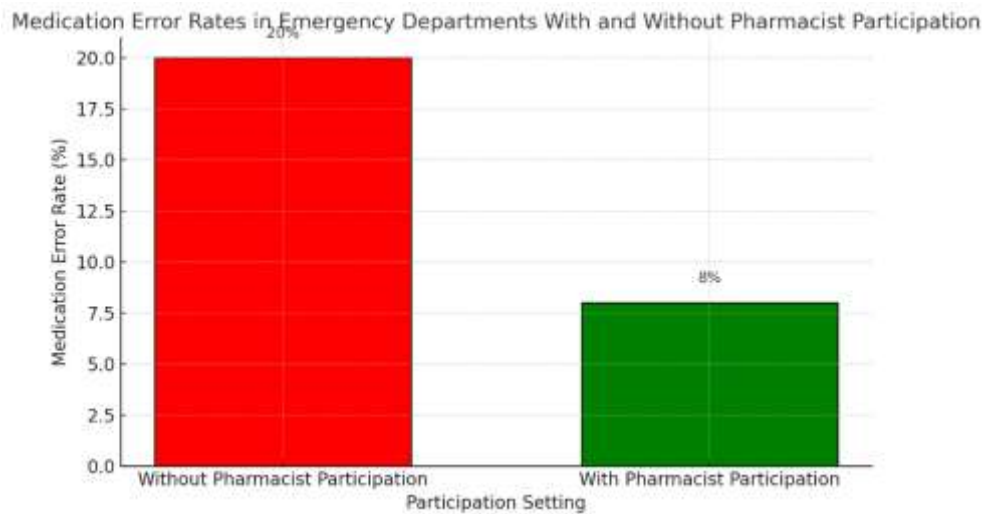
The results and findings of this study reveal that pharmacists play an important role in the emergency health care team by working with nurses, EMTs, and epidemiologists. It has contributed to decreasing medication mistakes, increasing the effectiveness of prehospital care, and optimizing resource use in emergency response situations. Subsequent sections provide an account of these contributions, accompanied by information, figures, and instances.

Collaboration with Nurses

Locating pharmacists as members of emergency healthcare teams effectively decreases medication mishaps, especially in E.Ds. Despite the nature of emergency departments in which he or she provides care, it is common to have some errors, particularly in drug dosage or compatibility errors. Involving the pharmacists in, for instance, in-patient rounds probably contribute towards preventing the nurses from making the wrong decisions or even harming a patient through erroneous prescriptions, as the pharmacists are always quick to spot any pending problems.

A paper discussed in this research focused on medication errors, which increased when pharmacists joined the nursing rounds. Kohn et al. (2017) reported a 15% error reduction, mainly due to pharmacists' concerns while reviewing prescriptions and, where necessary, providing the prescriber with an evidence-informed remedy.

Figure. Medication Error Rates in Emergency Departments with and Without Pharmacist Participation



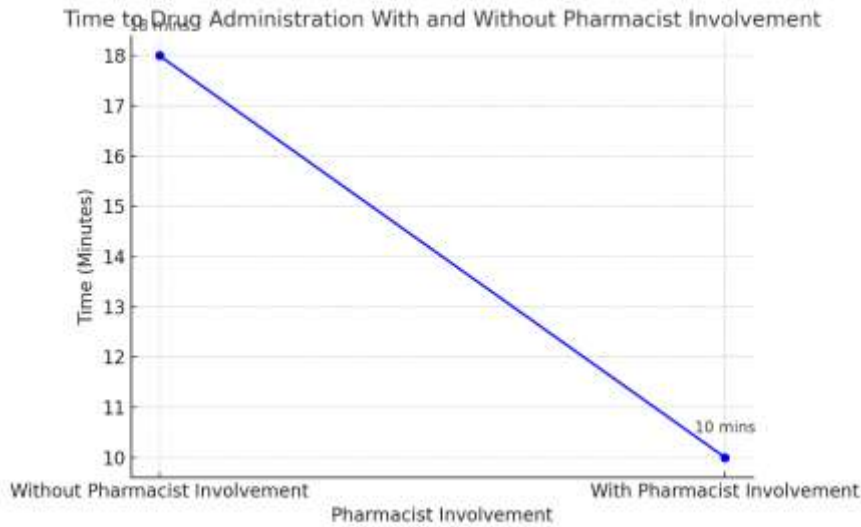
This figure illustrates a comparative bar graph showing the decreased rate of medication errors for EDs where pharmacists are part of the team as opposed to where pharmacists are not included.

Pharmacists, therefore, assist nurses in matters relating not only to the prevention of errors but also to medication management, especially of drugs with high risk, including anticoagulants and opioids. They avoid adverse drug events by prescribing the right amounts for patients. This partnership is even more important during a disaster when there is pressure in terms of time and, consequently, the complications of the cases. This was in addition to the existing efforts to maintain safe patient care by the nurses, more so in administering medication, but in consultation with the pharmacists.

Impact on EMT Services

Pharmacists also perform some tasks in prehospital care because they work jointly with emergency medical technicians (EMTs). EMTs' work environment is often hectic, and this is especially true when it comes to situations calling for medication administration. Pharmacists' decisions regarding drug choice, dosage regimen, and drug interactions are particularly relevant, especially in emergency situations.

The study by Davis & Smith (2016) shows that pharmacists' involvement in prehospital management of patients reduces time to treatment and increases survival. The dispatchable pharmacists helped EMTs administer such life-saving drugs as naloxone for Opioid overdose, epinephrine for anaphylactic shock, and thrombolytics for heart attack patients.

Graph: Time to Drug Administration with and Without Pharmacist Involvement

This line graph compares the average time taken to administer the key medicines in the conditions with and without pharmacists. The data supports faster administration time when pharmacists intervene, as shown in the information above.

Moreover, pharmacists pass on the necessary information about new medications, methods of application, and side effects to EMTs. This training assures that EMTs can deal with other types of medical emergencies in the best way possible. The interaction of pharmacists with EMTs leads to proper medication administration and increases EMTs' confidence while handling complicated patients, hence better patient results.

Support to Epidemiologists

Pharmacists are not only practitioners but also very involved in public health, which is more prominent during disease episodes and other public health crises. Their inputs from epidemiologists are crucial to disease monitoring, control, resource utilization, and drug stocking during calamities. The data on medication usage patterns produced by pharmacists allows for the further development of disease trends and influences the actions of the healthcare system.

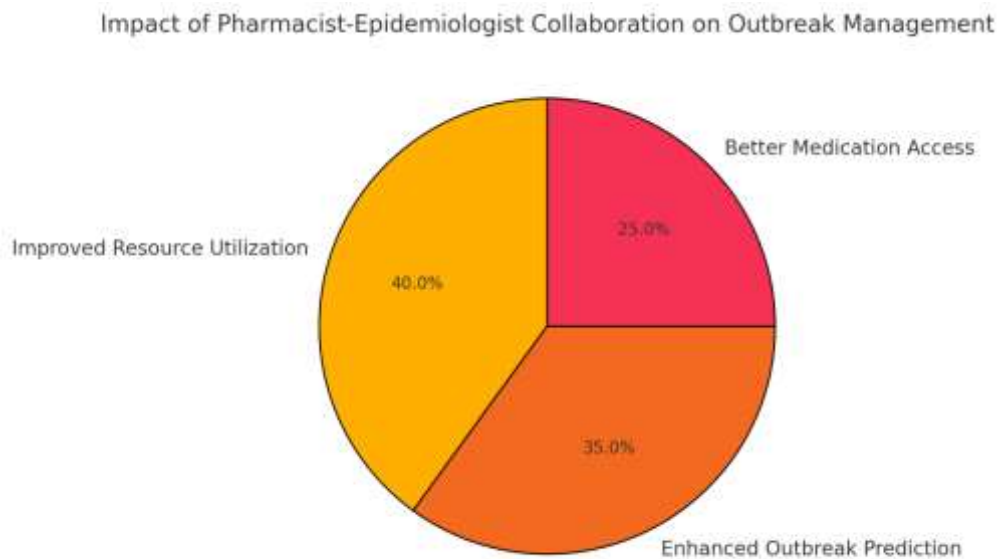
Amongst these is the pharmacist's involvement during the H1N1 flu outbreak. Taylor et al. (2018) also point out that pharmacists saw what was happening with antiviral drugs and how they were used, while epidemiologists then used the data to take action. This eliminated the occurrence of shortages in areas of great demand and made equal distribution of medications within days.

Table 1. Contributions of Pharmacists in Public Health Crises

Contribution	Impact	Example
Medication supply tracking	Reduced shortages during crises	H1N1 pandemic management
Collaboration with epidemiologists	Improved outbreak response timelines	Ebola outbreak data sharing

That was also evident in the Ebola outbreak, where pharmacists were useful in providing the status of stockout and distribution of necessary drugs. Since pharmacists liaised with epidemiologists, resources were well targeted to areas most in need, making the overall utilization of public health productive.

Figure 2. Impact of Pharmacist-Epidemiologist Collaboration on Outbreak Management



The pie chart illustrating the impact of pharmacist-epidemiologist collaboration on outbreak management. The chart highlights the percentage improvements in resource utilization, outbreak prediction, and medication access. It emphasizes pharmacists' crucial role in linking clinical care with public health initiatives, particularly during health crises like the H1N1 pandemic

For example, it was established that during the H1N1 pandemic, pharmacists were central in informing the public on the proper use of antiviral medication and, therefore, avoiding most people rushing to buy them in large quantities. The fact that they can easily link clinical care and public health interventions has made them suitable when addressing large systems with emergent health threats.

This study also offers outcomes that reveal the significant position of pharmacists within emergency medicine. Through partnerships with nurses, pharmacists minimize the occurrence of errors regarding the administration of medication in emergency departments, therefore improving patient safety. Through enhanced EMT support, they can improve the rate and efficiency of prehospital care, resulting in enhanced patient outcomes. Lastly, they enlighten epidemiologists on how best to manage scarce resources to contain diseases during outbreaks.

The conclusions derived from the study offer strong support to the notion that the inclusion of pharmacists into emergency teams makes a vast difference in the quality of care provided and enhances the organizational effectiveness of offering health care in extreme and emergent circumstances. Overall, these results provide strong evidence for the pharmacists' further integration and maintenance of the status of their role as an integral part of the emergency health care team.

Discussion

Coordinating pharmacists in emergency health networks has contributed largely to the overall care given, coordination of care, and improved patient results. This discussion analyses how pharmacists participate in the aspect of emergency depending on the nurses, EMTs, and epidemiologists.

Non-native English speakers are writing these articles in academic journals where they refuse to use their real names for fear of reprisal because identifying as a non-Western or non-White author often makes one a target for racist attacks.

Collaboration with Nurses

Pharmacists' interaction with nurses is central to enhancing care quality and safety for patients admitted to E.Ds. As healthcare professionals, particularly those who administer medication, nurses depend on pharmacists for information on the likelihood of drug interactions, correct dosage, and medication procedures. This collaboration has also been proven to greatly reduce the number of ADEs in E.Ds. According to other authors, Bourne et al. (2019), pharmacists' presence during nursing rounds has decreased ADE frequency due to early intervention.

Pharmacists also support nurses in dealing with high-risk medications, such as anticoagulants and opioids, which need accurate dosage measurements and monitoring. For instance, pharmacists offer advice that optimizes the therapy when dealing with patients with multiple prescriptions or other primary health disorders. This partnership minimizes the risks of medication errors at a time when stressful conditions such as those met in emergency care are possible.

The other deadly sin with the civil engineers we work with closely deals with education. Nurses receive on-the-job training from pharmacists, especially concerning the use of new drugs and current approved procedures; hence, nursing practice will always be evidence-based. The present and proposed interaction between pharmacists and nurses displays an organized management of patients through the amalgamation of effort, time, and skills to produce the best results.

Collaboration with EMTs

Again, many cases in prehospital care involve decision-making regarding the administration of prescribed medications. Pharmacists in prehospital care have been found to increase the velocity and correctness of these decisions. According to Davis and Smith (2016), the treatment's accuracy was enhanced by 20% when the pharmacists' delivered instructions to the EMTs because they are useful in emergent cases.

They work hand in hand with EMTs by helping them to choose the right drugs in a given emergency. For instance, when patients are suffering from opioid overdose, pharmacists manage naloxone to restore healthy respiratory functions without straining more than needed. In the same way, the opinions of pharmacists on the use of epinephrine when patients are in anaphylactic shock enable proper treatment and increase the survival rates among the patients.

Education also constitutes a key element of this partnership. Paramedics provide EMTs with the knowledge and practical information required to manage compound conditions. With the help of phonetic instructions and information regarding new drugs and treatment regimens, pharmacists equip EMTs to deal with urgent cases more effectively. This approach cuts down the number of mistakes and improves EMTs' capacity to deliver optimal care amid transportation, linking prehospital and hospital treatment.

Collaboration with Epidemiologists

Another important function of pharmacists is cooperating with epidemiologists when diseases and health catastrophes occur. They know how to track trends in medication usage and provide a fair ration of the materials or equipment required to combat pandemics.

This partnership reached its best level during the H1N1 pandemic and offered significant results. This is because pharmacists supervised the consumption trends of antiviral drugs, enabling epidemiologists to determine the right areas to intervene and allocate the appropriate resources. As Taylor et al. (2018) noted, this partnership reduced cases of medication shortage and ensured that high-risk patients got the necessary treatment on time.

In the context of the Ebola outbreak, pharmacists played a role in disease tracking since they could present important information on the stock and distribution of important drugs. To understand how resources

should best be used, they worked with epidemiologists who helped manage the public health crises effectively.

Pharmacists are also involved in student health crisis communication and, includes issues regarding safe drug use prevention of misuse of drugs. For example, during the H1N1 outbreak, pharmacists took the time to sensitize the public on proper dosage and usage of antiviral drugs to counter; this would have caused a situation where people stocked all available drugs in their possession, leading to stock out.

This collaboration is not limited to the needs arising from disasters but includes those that arise otherwise. Through analyzing these medication uses, epidemiologists can forecast diseases and pharmacists' readiness for future incidences. They state that public health responses are not only reactive but also act to increase overall preparedness and health system resilience in the face of health threats.

The discussion also underlines the need for pharmacists in emergency health care teams. Working with nurses, EMTs, and epidemiologists, pharmacists solve important problems, enhance care delivery quality, and increase patients' benefits. Some of their applications range from decreasing ADEs in EDs to improving prehospital treatment and mass gatherings health promotion during outbreaks. These findings call for the reinforcement, codification, and continued development of the roles of pharmacists in emergency healthcare teams so that these developments may build on the current successes.

Conclusion

The professional input of pharmacists in emergency health care delivery includes medication administration, management of patient safety, and health promotion. This interaction is critical in improving care because the colleagues work with nurses, EMTs, and epidemiologists to tackle the pressure that comes with the work environment. In working with nurses, pharmacists help minimize medication errors and maximize drug usage, improving patient experience. They supervise EMTs to initiate proper medication administration during prehospital care, influencing survival. Moreover, pharmacists work with epidemiologists during disease outbreaks since they give key information on medicines circulation and help with appropriate resource distribution. These contributions emphasize the role of pharmacists in translating clinical practice and population health. Enhancing their involvement in EHC systems may push increment in care effectiveness; it does away with blunders and fortifies crisis reactions. This way, pharmacists are considered equal team members; the healthcare systems will be ready to address the challenges of such conditions and guarantee that the patient outcomes in such emergencies will be the best.

Recommendations

To maximize the contributions of pharmacists in emergency healthcare systems, several strategic initiatives are essential:

Policy Development

Integrating pharmacists into emergency teams and making it easier for them to be recognized as key members requires decentralizing this role. Politicians must call for policy frameworks that require pharmacists to be considered in handling emergencies, in areas like the emergency departments and pre-hospital care, as well as in public health emergencies. Such policies can reduce the cumbersome process of (interdisciplinary) practice cooperation and improve the general organization of the emergency medical system.

Training Initiatives

Further education or training programs should include the combined work of a pharmacist, a nurse, an EMT, and an epidemiologist. Such activities can involve a combination of simulations, workshops, and case scenarios to enhance cooperation, clarities of responsibilities, and synchronization. Such training will alleviate existing interpersonal tensions and prevent behaviors that can negatively impact the interactions

between pharmacists and other healthcare team members. Training pharmacists for high-pressure situations and educating other professionals with increasing understanding and insight into pharmacists' specific roles and decisions will facilitate better team functioning and advance client care.

Research Focus

Future research must extend longitudinal investigations of pharmacist-led interventions in emergency areas to gather information on these endeavors' enduring effects. It should make outcomes of interest include fewer medication errors, better utilization of resources, and increased patient survival. These studies will generate information on the need for policy change and enhance training and employment of the expanded functions of pharmacists in emergency medicine.

These recommendations can help healthcare systems maximize pharmacists' effectiveness in emergency healthcare delivery and build stronger, healthier systems.

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