

Pharmaceutical Care, Global Health, and the Sustainable Development Goals: Aligning SDG 3 and SDG 17

Abstract

Global health has become a major priority in the 21st century due to rising health inequities, increasing burden of chronic and infectious diseases, and limited access to quality healthcare services, particularly in low- and middle-income countries. Medicines play a central role in modern healthcare; however, challenges related to their safe use, affordability, accessibility, and rational utilization continue to affect health outcomes worldwide. Pharmaceutical care, a patient-centered approach to pharmacy practice, focuses on optimizing medication therapy and improving patients' quality of life, thereby contributing significantly to global health improvement.

The United Nations Sustainable Development Goals (SDGs) provide a global framework for addressing health and development challenges. Among these, SDG 3 aims to ensure good health and well-being for all, while SDG 17 emphasizes the importance of partnerships and collaboration to achieve sustainable development. Pharmaceutical care aligns closely with these two goals by improving access to essential medicines, enhancing patient safety, supporting the management of communicable and non-communicable diseases, and promoting health prevention activities through collaborative efforts.

This narrative review explores the role of pharmaceutical care in advancing global health through its alignment with SDG 3 and SDG 17. It discusses the contribution of pharmacists to universal health coverage, rational use of medicines, and public health, as well as the importance of partnerships involving healthcare professionals, policymakers, academic institutions, and international organizations. The review also highlights key challenges and future perspectives for strengthening pharmaceutical care. Integrating pharmaceutical care within the SDG framework is essential for improving global health outcomes and achieving sustainable healthcare development.

Keywords

Pharmaceutical care; Global health; Sustainable Development Goals; SDG 3; SDG 17; Pharmacists; Health partnerships.

Introduction

As we are in the 21st century, global healthcare has become one of the most important and critical areas of focus. This increased attention is mainly due to rising health inequities, a growing number of chronic diseases, increasing infectious disease threats, and limited access to healthcare services in many regions of the world. According to the World Health Organization, global health focuses on improving health outcomes and achieving equality among people worldwide through collective action, evidence-based interventions, and strong healthcare systems [1]. Although significant progress has been made in healthcare, many challenges still remain, particularly in ensuring equal access to quality healthcare services.

Medicines are one of the most important tools available in modern healthcare for the prevention, control, and treatment of diseases. They play a key role in reducing morbidity and mortality and improving the quality of life of patients. However, problems related to the effective use of medicines, patient safety, affordability, and

accessibility continue to exist, especially in low- and middle-income countries. In these settings, limited availability of essential medicines, irrational drug use, and poor medication management often result in suboptimal treatment outcomes [2].

Pharmaceutical care is a patient-centered approach to pharmacy practice in which pharmacists take responsibility for ensuring that medicines are used appropriately to achieve the best possible health outcomes. In the past, the role of pharmacists was mainly limited to dispensing medicines. Over time, this role has expanded to include patient counseling, monitoring of drug therapy, prevention of medication-related problems, and involvement in public health activities. This shift highlights the importance of pharmacists as active contributors to patient care and healthcare systems [3].

In 2015, the United Nations introduced the 2030 Agenda for Sustainable Development, which consists of 17 Sustainable Development Goals (SDGs) aimed at promoting global development and well-being [4]. Among these goals, SDG 3: Good Health and Well-Being focuses on ensuring healthy lives and promoting well-being for people of all ages by improving access to healthcare services, essential medicines, and vaccines, and by reducing deaths from communicable and non-communicable diseases [5]. In addition, SDG 17: Partnerships for the Goals emphasizes the importance of collaboration among governments, healthcare professionals, academic institutions, private organizations, and international agencies to achieve sustainable development targets [4].

The relationship between pharmaceutical care and SDG 3 and SDG 17 is especially important for strengthening healthcare systems across the world. Pharmacists not only provide direct patient care but also work closely with other healthcare professionals to improve the quality and safety of medication use. Through effective partnerships and collaborative efforts, pharmacists can help improve access to essential medicines, promote rational drug use, and enhance patient safety [6]. Such collaborations also support education, research, and capacity building, which are essential for achieving long-term improvements in global health.

Despite the increasing recognition of the role of pharmacists in healthcare delivery, their contribution to global health and sustainable development remains limited in many regions. Factors such as inadequate clinical training, workforce shortages, regulatory challenges, and insufficient involvement in health policy planning restrict the full implementation of pharmaceutical care services [7]. Therefore, it is important to understand how pharmaceutical care aligns with SDG 3 and SDG 17 in order to strengthen healthcare systems and improve global health outcomes.

The objective of this narrative review is to explore the role of pharmaceutical care in advancing global health by aligning with SDG 3 (Good Health and Well-Being) and SDG 17 (Partnerships for the Goals), and to discuss the opportunities, challenges, and future directions for integrating pharmacists into sustainable healthcare strategies.

Concept of Pharmaceutical Care

Pharmaceutical care is a professional practice in which the pharmacist takes responsibility for a patient's medication-related needs and works to achieve positive health outcomes. The concept was formally introduced by Charles D. Hepler and Linda M. Strand, who defined pharmaceutical care as the responsible provision of drug therapy for the purpose of achieving definite outcomes that improve a patient's quality of life [8]. This approach places the patient at the center of pharmacy practice rather than focusing only on the medicine product.

Evolution of Pharmaceutical Care

Traditionally, the role of pharmacists was mainly limited to dispensing medicines and ensuring correct supply. However, with the increasing complexity of drug therapy and the rising burden of chronic diseases, this role has gradually evolved. Pharmacists are now expected to play a more active role in patient care by monitoring treatment outcomes, identifying drug-related problems, and providing appropriate interventions when necessary [9].

This shift from a product-oriented role to a patient-oriented role has strengthened the importance of pharmaceutical care in modern healthcare systems. The transition from traditional pharmacy practice to pharmaceutical care is summarized in Table 1. Today, pharmacists are recognized as essential healthcare professionals who contribute to safe, effective, and rational use of medicines across various healthcare settings.

Core Components of Pharmaceutical Care

Pharmaceutical care involves several key components that aim to improve patient outcomes. These include medication therapy management, patient counseling, monitoring of drug efficacy and safety, prevention of adverse drug reactions, and promotion of medication adherence. Pharmacists also play an important role in identifying and resolving drug-related problems such as inappropriate drug selection, incorrect dosing, drug interactions, and non-adherence [10].

In addition, pharmaceutical care includes participation in pharmacovigilance activities, where pharmacists help in detecting, assessing, and reporting adverse drug reactions. These activities contribute to improving patient safety and strengthening healthcare systems.

Role of Pharmacists in Healthcare Systems

Pharmacists provide pharmaceutical care in various healthcare settings, including community pharmacies, hospitals, and public health programs. In community settings, pharmacists are often the most accessible healthcare professionals and play a key role in patient education, chronic disease management, and health promotion. In hospital settings, clinical pharmacists work closely with physicians and nurses to optimize medication therapy and reduce medication errors [11].

At the public health level, pharmacists contribute to disease prevention programs, vaccination services, and health awareness campaigns. Their involvement in these activities highlights the expanding role of pharmaceutical care beyond individual patient treatment to broader population health improvement.

Overall, pharmaceutical care serves as a vital link between medicines and patient outcomes. By ensuring the rational and safe use of medicines, pharmacists play a crucial role in improving healthcare quality and supporting global health objectives.

Overview of the Sustainable Development Goals (SDGs)

The Sustainable Development Goals (SDGs) were introduced as a global framework to address major social, economic, and health-related challenges faced by countries across the world. In 2015, the United Nations adopted the 2030 Agenda for Sustainable Development, which consists of 17 SDGs aimed at promoting sustainable growth, reducing inequalities, and improving the quality of life for all people [12]. These goals are interconnected and emphasize that progress in one area often depends on progress in others.

Health plays a central role within the SDG framework, as it is closely linked to education, poverty reduction, economic development, and social well-being. Among the 17 goals, SDG 3: Good Health and Well-Being focuses on ensuring healthy lives and promoting well-being for people of all ages. Key targets under SDG 3 include reducing maternal and child mortality, controlling communicable diseases such as HIV, tuberculosis, and malaria, addressing the growing burden of non-communicable diseases, achieving universal health coverage, and ensuring access to safe, effective, quality, and affordable essential medicines and vaccines [13]. These targets directly relate to the roles and responsibilities of healthcare professionals, including pharmacists.

In addition to SDG 3, SDG 17: Partnerships for the Goals highlights the importance of collaboration in achieving sustainable development. SDG 17 emphasizes the need for strong partnerships between governments, international organizations, healthcare professionals, academic institutions, private sectors, and civil society [12]. Such partnerships support knowledge sharing, capacity building, financial assistance, and technology transfer, all of which are essential for strengthening healthcare systems globally.

The achievement of SDG 3 is strongly dependent on the successful implementation of SDG 17. Without effective partnerships, it is difficult to improve access to healthcare services and essential medicines, particularly in low- and middle-income countries. Therefore, aligning health-related goals with strong collaborative efforts is crucial for improving global health outcomes and ensuring sustainable healthcare development [14].

Pharmaceutical Care and SDG 3: Good Health and Well-Being

SDG 3 aims to ensure healthy lives and promote well-being for people of all ages. Achieving this goal requires strong healthcare systems, access to essential medicines, patient safety, and effective disease prevention strategies. Pharmaceutical care plays an important role in supporting SDG 3, as pharmacists are directly involved in medication management, patient education, and public health activities that improve health outcomes.

Universal Health Coverage and Access to Medicines

One of the key targets of SDG 3 is achieving universal health coverage, which includes access to safe, effective, quality, and affordable essential medicines. Pharmacists contribute significantly to this target by ensuring the availability and appropriate use of medicines within healthcare systems. In many low- and middle-income countries, pharmacists help improve access to essential medicines by managing supply chains, promoting the use of generic medicines, and supporting rational prescribing practices.

According to the World Health Organization, lack of access to essential medicines remains a major barrier to achieving good health outcomes worldwide [15]. Through pharmaceutical care services, pharmacists help reduce this gap by ensuring correct medicine selection, proper dosing, and patient counseling, thereby improving treatment effectiveness and reducing unnecessary healthcare costs.

Management of Communicable and Non-Communicable Diseases

Pharmaceutical care plays a vital role in the prevention and management of both communicable and non-communicable diseases, which are major focus areas under SDG 3. In communicable diseases such as HIV, tuberculosis, and malaria, pharmacists support treatment adherence, monitor adverse drug reactions, and educate patients on the correct use of medicines. These interventions help improve treatment success rates and reduce disease transmission.

Non-communicable diseases such as diabetes, hypertension, asthma, and cardiovascular diseases are increasing globally and require long-term medication management. Pharmacists play a key role in monitoring

therapy, promoting adherence, and counseling patients on lifestyle modifications. Through regular follow-up and patient education, pharmaceutical care helps improve disease control and reduces complications associated with chronic conditions [16].

Patient Safety and Rational Use of Medicines

Patient safety is a critical component of SDG 3, and pharmaceutical care contributes directly to reducing medication-related harm. Medication errors, adverse drug reactions, and inappropriate medicine use are common causes of preventable illness and hospitalizations. Pharmacists help minimize these risks by reviewing prescriptions, identifying potential drug interactions, and ensuring correct dosing.

Rational use of medicines is another important area where pharmaceutical care supports SDG 3. Pharmacists promote evidence-based medicine use and discourage unnecessary or inappropriate prescribing. They also play a key role in antimicrobial stewardship programs, which aim to reduce antimicrobial resistance by promoting the responsible use of antibiotics [17]. These activities are essential for protecting public health and ensuring the long-term effectiveness of medicines.

Health Promotion and Disease Prevention

Beyond disease treatment, pharmaceutical care also supports health promotion and disease prevention, which are central to SDG 3. Pharmacists are increasingly involved in vaccination services, health screening programs, and patient education initiatives. In community settings, pharmacists provide advice on smoking cessation, nutrition, physical activity, and preventive healthcare practices.

Pharmacists are often the most accessible healthcare professionals, especially in underserved areas. Their involvement in preventive care helps identify health risks at an early stage and encourages timely referral to other healthcare services. According to the International Pharmaceutical Federation, expanding the public health role of pharmacists can significantly improve population health outcomes and support the achievement of SDG 3 [18].

Overall, pharmaceutical care contributes to SDG 3 by improving access to medicines, enhancing patient safety, supporting disease management, and promoting preventive healthcare. Strengthening pharmaceutical care services is therefore essential for achieving sustainable improvements in global health and well-being.

The alignment between pharmaceutical care activities and SDG 3 targets is presented in Table 2.

Pharmaceutical Care and SDG 17: Partnerships for the Goals

SDG 17 highlights the importance of partnerships in achieving sustainable development goals, including health-related targets. It emphasizes that no single country or healthcare profession can address global health challenges alone. Strong partnerships between governments, healthcare professionals, international organizations, academic institutions, non-governmental organizations, and the private sector are essential for improving healthcare delivery and access to medicines worldwide [19].

Role of Partnerships in Strengthening Pharmaceutical Care

Pharmaceutical care depends heavily on collaboration among different stakeholders within the healthcare system. Pharmacists work closely with physicians, nurses, and other healthcare professionals to ensure the safe and effective use of medicines. Interprofessional collaboration improves treatment outcomes, reduces medication errors, and enhances patient safety. Such teamwork reflects the core principles of SDG 17, which promotes shared responsibility and coordinated action [20].

At the global level, partnerships between international organizations and national health systems support the development and implementation of pharmaceutical policies. The World Health Organization plays a key role in supporting countries through technical guidance, capacity building, and policy development related to medicines and pharmaceutical services [21].

Public–Private Partnerships in Pharmaceutical Care

Public–private partnerships are important for improving access to medicines, especially in resource-limited settings. Collaboration between governments and pharmaceutical companies can support the production and distribution of affordable medicines, including essential and generic drugs. These partnerships also help strengthen medicine supply chains and reduce shortages, which directly supports pharmaceutical care services [22].

In addition, partnerships with private healthcare providers and community pharmacies help extend pharmaceutical services to underserved populations. Through shared resources and coordinated efforts, public–private collaborations can improve medicine availability, enhance service delivery, and support universal health coverage [23].

Academic and Research Collaborations

Academic institutions play a vital role in supporting SDG 17 by contributing to education, research, and innovation in pharmaceutical care. Partnerships between universities, research institutions, and healthcare organizations help strengthen pharmacy education and promote evidence-based practice. Collaborative research initiatives support the generation of data on medication use, treatment outcomes, and healthcare quality [24].

International research collaborations also help build capacity in low- and middle-income countries by providing training opportunities and access to research infrastructure. These partnerships support knowledge sharing and contribute to the development of context-specific pharmaceutical care models [25].

Technology and Digital Health Partnerships

Technology-based partnerships are increasingly important in modern healthcare. Digital health tools such as electronic health records, telepharmacy, and mobile health applications support pharmaceutical care by improving communication, monitoring medication use, and enhancing patient follow-up. Partnerships between healthcare providers, technology companies, and policymakers are essential for the successful implementation of these innovations [26].

Overall, pharmaceutical care aligns strongly with SDG 17 through collaboration, shared expertise, and coordinated action. Strengthening partnerships at local, national, and global levels is essential for improving pharmaceutical services, enhancing patient outcomes, and achieving sustainable global health goals.

Integrating SDG 3 and SDG 17 Through Pharmaceutical Care

SDG 3 (Good Health and Well-Being) and SDG 17 (Partnerships for the Goals) are closely connected and cannot be achieved independently. Improving health outcomes requires not only effective healthcare services and access to medicines but also strong partnerships and collaborative efforts at local, national, and global levels. Pharmaceutical care serves as an important link between these two goals by combining patient-centered care with multi-stakeholder collaboration.

The achievement of SDG 3 depends heavily on the availability and proper use of medicines, trained healthcare professionals, and well-functioning health systems. Pharmacists contribute to these areas by ensuring safe and effective medication use, promoting adherence, and supporting disease prevention and management. However, these activities often require cooperation with other healthcare professionals, policymakers, academic institutions, and international organizations. This collaborative approach directly reflects the principles of SDG 17 [27].

Pharmacists play a key role as connectors within healthcare systems. Through interprofessional collaboration, pharmacists work with physicians and nurses to optimize treatment plans and reduce medication-related problems. At the policy level, pharmacists contribute to the development and implementation of national medicine policies, essential medicines lists, and treatment guidelines. Partnerships with government agencies and international organizations such as the World Health Organization help strengthen pharmaceutical systems and improve access to quality medicines [28].

At the global level, partnerships supported by the United Nations and professional bodies such as the International Pharmaceutical Federation encourage knowledge sharing, workforce development, and capacity building. These collaborations support training programs, research initiatives, and the adoption of best practices in pharmaceutical care, particularly in low- and middle-income countries [29]. Such efforts help reduce health inequalities and improve population health outcomes, aligning with the objectives of SDG 3. The key stakeholders involved in integrating SDG 3 and SDG 17 through pharmaceutical care are summarized in Table 3.

Digital health and technological innovations further strengthen the integration of SDG 3 and SDG 17. Telepharmacy services, electronic prescribing systems, and shared health information platforms require partnerships between healthcare providers, technology developers, and policymakers. These innovations improve continuity of care, enhance medication monitoring, and expand access to pharmaceutical services, especially in remote and underserved areas [30].

Overall, integrating SDG 3 and SDG 17 through pharmaceutical care highlights the importance of collaborative, patient-centered approaches to healthcare. Strengthening partnerships while expanding the role of pharmacists can significantly improve health outcomes and support sustainable global health development. The integration of SDG 3 and SDG 17 through pharmaceutical care partnerships is illustrated in Figure 3.

Challenges and Barriers in Implementing Pharmaceutical Care for Global Health

Although pharmaceutical care has the potential to significantly support global health and the achievement of SDG 3 and SDG 17, several challenges and barriers limit its effective implementation. These challenges exist at individual, institutional, and system levels, particularly in low- and middle-income countries.

One of the major challenges is the shortage of trained pharmacy professionals. In many regions, there is an insufficient number of pharmacists, and those available are often overburdened with dispensing responsibilities. This limits the time and opportunity for providing patient-centered pharmaceutical care services such as counseling, medication review, and follow-up [31]. In addition, inadequate clinical training and limited exposure to pharmaceutical care concepts during pharmacy education further restrict the effective practice of pharmaceutical care.

Regulatory and policy-related barriers also affect the implementation of pharmaceutical care. In some countries, the scope of pharmacy practice is limited by outdated regulations that do not fully recognize the clinical role of pharmacists. Lack of supportive policies and poor integration of pharmacists into healthcare teams reduce their ability to contribute to patient care and public health initiatives [32]. According to the World Health Organization, strengthening pharmaceutical policies and workforce integration is essential for improving healthcare outcomes [33].

Another important challenge is limited access to essential medicines and weak supply chain systems. Medicine shortages, poor storage conditions, and inefficient distribution systems negatively affect the quality of pharmaceutical care. These issues are often worsened by financial constraints, especially in resource-limited settings, where patients may be unable to afford prescribed medicines [34].

Lack of awareness among patients and other healthcare professionals about the role of pharmacists in pharmaceutical care is another barrier. In many settings, pharmacists are still viewed primarily as medicine suppliers rather than healthcare providers. This perception reduces collaboration and limits the utilization of pharmacists' skills [35]. The International Pharmaceutical Federation has emphasized the need to strengthen professional recognition and interprofessional collaboration to overcome these challenges [36].

Addressing these barriers is essential for strengthening pharmaceutical care and ensuring its effective contribution to global health and sustainable development goals. The major challenges in pharmaceutical care and the corresponding future directions are summarized in Figure 4.

Future Perspectives and Policy Recommendations

Strengthening pharmaceutical care is essential for improving global health outcomes and supporting the achievement of SDG 3 and SDG 17. In the future, greater recognition of the role of pharmacists in healthcare systems will be necessary to fully utilize their skills and expertise. Expanding pharmaceutical care services beyond traditional dispensing roles can significantly improve patient safety, treatment outcomes, and access to healthcare.

One important future direction is the improvement of pharmacy education and training. Pharmacy curricula should place greater emphasis on clinical skills, patient-centered care, public health, and interprofessional collaboration. Continuous professional development programs are also needed to help practicing pharmacists update their knowledge and adapt to evolving healthcare needs. Strengthening education and training will better prepare pharmacists to contribute effectively to global health initiatives [37].

Policy support is another key area for improvement. Governments and regulatory bodies should develop and implement policies that recognize pharmacists as essential healthcare providers. Expanding the scope of pharmacy practice and integrating pharmacists into primary healthcare teams can enhance pharmaceutical care delivery. According to the World Health Organization, strong policy frameworks are crucial for strengthening healthcare systems and achieving universal health coverage [38].

International collaboration and partnerships should also be further encouraged. Organizations such as the United Nations and the International Pharmaceutical Federation play a vital role in promoting cooperation, sharing best practices, and supporting capacity-building initiatives across countries. Strengthening such partnerships will help reduce global health inequalities and support sustainable development [39].

In addition, the use of digital health technologies offers new opportunities for expanding pharmaceutical care services. Telepharmacy, electronic prescribing, and digital medication management systems can improve access to pharmaceutical care, particularly in rural and underserved areas. Policymakers and healthcare

institutions should support the adoption of these technologies through appropriate regulations and infrastructure development [40].

Overall, future strategies should focus on strengthening education, supportive policies, global partnerships, and technological innovation. These efforts will help maximize the contribution of pharmaceutical care to global health and sustainable development goals.

Conclusion

Pharmaceutical care plays an important role in improving global health outcomes by ensuring the safe, effective, and rational use of medicines. As global health challenges continue to increase in the 21st century, the contribution of pharmacists has become more relevant than ever. This review highlights how pharmaceutical care aligns closely with SDG 3: Good Health and Well-Being by improving access to essential medicines, enhancing patient safety, supporting disease management, and promoting health prevention activities.

At the same time, the achievement of SDG 3 is strongly supported by SDG 17: Partnerships for the Goals. Effective collaboration among healthcare professionals, policymakers, academic institutions, international organizations, and the private sector is essential for strengthening healthcare systems and expanding pharmaceutical care services. Pharmacists, through their involvement in multidisciplinary healthcare teams and global health initiatives, serve as key contributors to these partnerships.

Despite the growing recognition of the importance of pharmaceutical care, several challenges such as workforce shortages, regulatory limitations, and unequal access to medicines continue to restrict its full implementation, particularly in low- and middle-income countries. Addressing these challenges requires supportive policies, improved education and training, and stronger international cooperation.

In conclusion, integrating pharmaceutical care within the framework of SDG 3 and SDG 17 provides a practical and sustainable approach to improving global health. Strengthening the role of pharmacists and promoting collaborative efforts will be crucial for achieving long-term health improvements and advancing sustainable development goals worldwide.

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