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REVIEW ARTICLE

ROLE OF PHARMACIST IN DEVELOPING SUSTAINABLE HEALTHCARE SYSTEM

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ABSTRACT

This review is focusing on a proactive role of pharmacists to maintain and further promote sustainability in the healthcare system. It is very essential for pharmacist to play an active role in educating and spreading awareness to the public and helping other healthcare professionals for the sustainable practices in healthcare system. A pharmacist with updated knowledge and efficient skills for best practices in sustainability can provide high-quality care and build up a safe environment. The versatile role of pharmacist makes him a leader as well as a trusted health professional of a healthcare system. There are many different roles that pharmacist can perform include patient counsellor, clinical practitioner, formulation scientist, analyst, regulatory controlled, educator, health professional, in medicines management and safe environment, etc. are also depicted in this review. At last, it is the collective efforts by all stakeholders who are engage in health wellness of the society to work together for a very noble cause by understanding various health related problems, their causes and learn effective management of medicines and its disposal and also teach to common people, which can help in improvement of public health and also help in keeping the safe environment for the future generations also.

Keywords: Sustainable practices, Healthcare System, Pharmacist, Roles and Responsibilities, Safe Environment

INTRODUCTION – SUSTAINABLE HEALTHCARE SYSTEM

A sustainable healthcare system is 'a system of healthcare which aims and provides best quality care in an affordable way, with no or minimal impact to the environment'. It further describes in simple way that a system meets today's health needs and with focusing to the best health for next generations. Health of all the living creatures on earth and the environment surrounding them are connected intrinsically and mutually responsible to support each other by supporting each other's health. Sustainable healthcare is based on three main principles.

1. Sustainable prevention,

2. Sustainable pathways and

3. Sustainable practice

Sustainable prevention covers first prevention - health and lifestyle, second prevention identification of disease in early stage and third prevention – minimizing the impact of developed disease. It means to provide both short-term and long-term sustainability advantages with support of minimum healthcare consumption. Sustainable pathways mean people will get the right and effective health service at the right time, right place and right price, and developing healthcare systems effective and efficient by minimizing healthcare's environment footprint using decrease in patient travel and avoiding duplication of health tests which is not observed in current scenario. Sustainable practice can be achieved by reducing the carbon footprint and resources which impact the environment and used to provide high quality health results. It can be achieved by decreasing biomedical waste and high standards of waste management, using highly sustainable and reusable materials and medical devices. Hence, it is the duty of pharmaceutical industries, organizations, government, medicine experts, healthcare professionals – PHARMACISTS (specially have professional responsibility) to take the steps that show both the clinical effectiveness of medicines and minimizing the environmental impact because of its use. Increase in population, unhealthy and unhygienic lifestyles, enhancing in chronic disease, ageing populations and high access to healthcare leads to boosting in healthcare requirements and high usage of natural resources in coming years, which drives to have impact on environment and climate change, hence it is the high need of sustainable transformation today to save the environment.

Not only considering one of the environmental challenges, climate change is now becoming a significant health threat that we have ever seen before [1]. Climate change is affecting social and environment health of people such as clean air, safe drinking water, sufficient food and secure shelter, specially to the people who are most vulnerable and deprived and are suffering from health inequalities [2]. The data shows that it's a trigger point to do

something now if we want to maintain the last 5 decades of our tremendous efforts of public health gains otherwise all these would be wiped out very soon.

ROLE OF PHARMACIST - GENERAL

The goal of sustainable healthcare systems can be achieved when different health professionals work together to meet the healthcare needs of patients. Globally, general practice (GP) responsibilities have increased significantly due to the growing number of patients with multiple illnesses and the corresponding rise in drug consumption. [3,4,5] Pharmacists are required to perform a variety of tasks in general practice, including medication reviews and the management of both acute illnesses and chronic medical disorders. They are considered as qualified specialists in medications with a range of knowledge and clinical abilities [6,7]. The PHARMACIST must be recognized as the top most professional that responsible for therapy management. PHARMACISTs are experts in healthcare systems as they are knowing the safe and effective use [8] of medicines. As medicines are the most significant intervention in healthcare systems [9]. The impact of APIs, the large carbon footprint generated from manufacturing and distribution of pharmaceutical product and finally the pharmaceutical waste, all three are having the major impacts on environment. The various stages of a life cycle of pharmaceutical product development, post production processes, health study, prescription, usage and final waste disposal, PHARMACIST has an impact on all these stages. The **Fig.1** exhibits various roles of pharmacist in different disciplines of healthcare system.

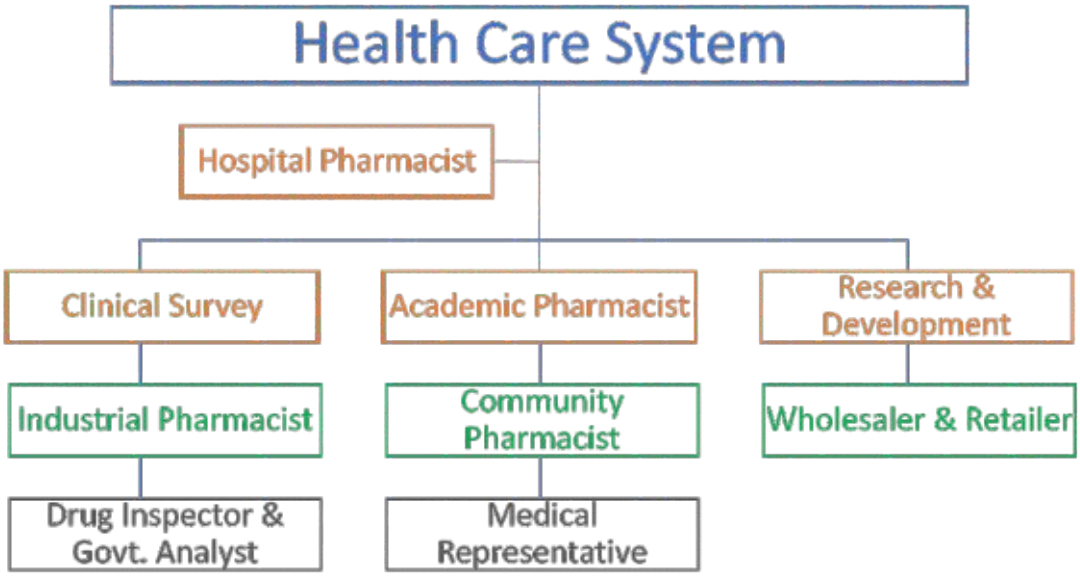

Figure 1: Various Roles of Pharmacist in Different Disciplines of Healthcare System [10]

The word PHARMACIST [5] stands for

P – Patience & Persistence	H – Honesty & Hardwork
A – Alertness and Active	R – Researcher
M – Motivator	A – Academician and Administrator
C – Courageous	I – Intelligent
S – Sincere and Spontaneous	T - Thinker

FUNCTIONAL SERVICES AND GOALS TO BE ACHIEVED BY PHARMACIST

The functional services by a PHARMACIST are -

- Clinical
- Medicines Information
- Quality Assurance
- Medicines Acquisition / Purchasing
- Technical Services
- Medicines Management
- Information Technology
- Research & Development
- Education & Training
- Medicines Supply & Dispensary

The Fig. 2 shows the goals to be achieved by a PHARMACIST to have sustainable healthcare systems such as availability of pharmaceutical care and services as and when required, providing right diagnosis and decision at the right time, counselling and updating information to patients, a sustainable, flexible and resilient delivery approach to the patients, etc.

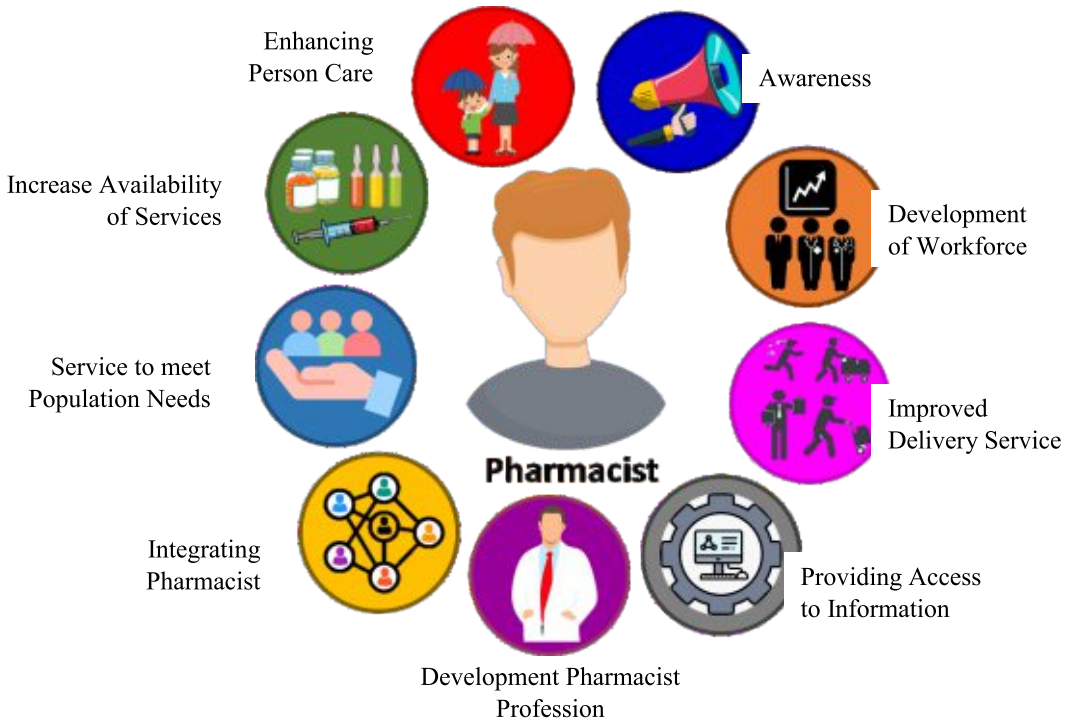

Figure 2: Goals to Achieve by A Pharmacist to Achieve a Sustainable Healthcare System [11]

DIFFERENT TYPES OF PHARMACISTS, THEIR ROLES AND APPLICATION FOR SUSTAINABLE HEALTHCARE

Table 1: Role of Various Types of Pharmacists for Development of Sustainable Healthcare System [10]

Type of Pharmacist	Role / Functions	Application for sustainable healthcare
Academic Pharmacist	• Teaching, Research, Practical Training • Organize conference, seminar, workshop, training, project, etc • Overall skills & personality development	Students who gain knowledge of scientific principles and techniques of pharmaceutical sciences help in new drug discovery and development and growth of his career in pharmacy profession;

		Disseminate information about drug disposal; understanding of medicine metabolism and toxicology help in understanding its impact in nature and to the environment
Industrial Pharmacist	• R&D • Manufacture and QA • Drug Information • Drug registration & application • Clinical Trials and post marketing surveillance • Sales and Marketing • Management	Contribute to development of pharmaceutical product with high quality, safety and effectiveness; Understanding of GMP, validation, overall production, testing etc. using six sigma and QbD approach; Provide detailed information on medicines to other health professionals and to the patients; Can do online efficient product submission as per the regulatory requirements of the country; Can have details information of effect of drug on humans before commercializing the products; Use biodegradable materials; usage of innovative approach for waste-management like plasma technology; perform on-line Qc testing using PAT; do architectural innovation with minimum resources and maximum utilization; shifting from in-vivo to in-vitro and ex-

		vivo studies; Reduce off-target events; reduce exposure via less emission;
Primary care pharmacists / prescribing advisors	• Health services including doctor's surgeries, advice to doctors for selection of medicine, strength and it's dose	Best use of medicines and its resources; Medication review clinic or pharmacy clinic; risk and hazard mitigation
Community pharmacist	• Frontline healthcare professional • Helping people, assessing their health status, and taking decision • Dispensing medicine and offering patient advice	Help to maintain people's health, diet control, quitting bad habits of patients; risk and hazard mitigation
Hospital Pharmacists	• Part of team where main focus is on patients and their health • Assist doctors • Manufacturing sterile medicines • General management of hospital • Enhance patient awareness	Manage drug shortages; Medication experts, COVID-19 medication management; develop treatment protocols, etc. Reduce medication errors and adverse drug events; Securing access to medicines and medical devices Closed loop medication system; Medicines without harm initiative
Regulatory Pharmacist	• Having the duty to see that all relevant laws and regulations are followed	Professionals in pharmaceutical regulation carry out important work with wide-ranging consequences. They ensure that

	• Regulate and communicate drug approval requirements • Member of a regulatory team	medications adhere to certain national and local regulations. Regulatory experts aid in guaranteeing that the general public has access to secure and efficient medications. [12]
Research & Development Pharmacist	• Developed new molecules for the different diseases • Formulate the new formulation to increase effect of already available formulation	Pharmacists contribute to research and their expertise in formulation development will particular relevance to the biological availability of active ingredients and enhance the patient's life. [13]
Pharmacist with special interest	• Specialized in specific area such as cancer and diabetes etc.	Clinical and educational services to community residents

FUTURE RESPONSIBILITIES OF PHARMACIST

By having knowledge of pharmacist role, it is important that pharmacist should accept the responsibility of entire medication-use process to reduce impact of pharmaceuticals on environment. The whole process of drug manufacturing to consumption and medical waste generation contributing to climate change [14]. Following are some approaches that pharmacist has to take up to maintain sustainable healthcare systems.

- More rational in prescribing reduce volume of unused medicines
- Become trusted, accessible and respected medical information resource
- Aware patients how to tackle the problems of drug disposal procedures
- Update themselves with every type of drug disposal method used in their area/region and recommend to patients
- Significant fundamental changes in pharmaceutical education curriculum covering drug disposal methods, drug metabolism and toxicology and its impact on nature [15]
- Effective eco-friendly approach for medical waste management programme
- Proper patient counselling about consumption of any medicine [16]
- Continue to learn, educate themselves and go for training for awareness of medicines use and its side effects [17].

CONCLUSION

Medicine use and its disposal is very critical issue today and need deeper understanding from healthcare professionals to the patients. Pharmacists as the trusted health professionals has the right to remain forefront in this movement and they are the real professionals who can educate and advice the people about the linkage between climate issue and public health. Proper and complete patient counselling about use of safe medication and its disposal can have a significant impact on public health and environment. This will only possible if these types of studies included in the education curriculum. Proper education, training, good hands in research with analytical capabilities make pharmacist to develop safe, effective and economic product with help of industrial resources and government support. Significant research and all multidisciplinary stake holders, government, physician, pharmacists, and people should engage to understand various health issues and learn proper use of right medicine with right diagnosis can improve public health and also reduce the burden on environmental impact. Some key priorities are rational prescribing and medicine use, controlling pharmaceutical waste, preventing adverse health, safe infrastructure and ways of working.

REFERENCES

[1]. https://www.england.nhs.uk/greenernhs/wp-content/uploads/sites/51/2020/10/delivering-a-net-zero-national-health-service.pdf Accessed July 19,2023.

[2]. https://www.who.int/news-room/fact-sheets/detail/climate-change-and-health Accessed July 19,2023.

[3]. Abdullah A. Alshehri, Ejaz Cheema, Asma Yahyouche, M. Sayeed Haque, Zahraa Jalal. (2021) Evaluating the role and integration of general practice pharmacists in England: a cross sectional study. International Journal of Clinical Pharmacy 43:1609–1618.

[4]. Hendrik van den Bussche, Gerhard Schon, Tina Kolonko, Heike Hansen, Karl Wegscheider, Gerd Glaeske, Daniela Koller. (2011) Patterns of ambulatory medical care utilization in elderly patients with special reference to chronic diseases and multimorbidity - Results from a claims data based observational study in Germany. BMC Geriatrics.

[5]. Cother Hajata, Emma Steinb. (2018) The global burden of multiple chronic conditions: A narrative review. Preventive Medicine Reports 12 284–293.

[6]. https://www.bma.org.uk/advice-and-support/gp-practices/employment-

advice- employing-clinical-pharmacists-in-gp-practices. Accessed December 16,2023.

[7]. https://www.rpharms.com/Portals/0/RPS%20document%20library/Open%20access/Policy%20statements/pharmacists-and-gp-surgeries.pdf Accessed July 19,2023

[8]. https://pip.scot/2018/07/07/pharmacists-are-the-experts-in medicines-says-alex-mackinnon/ Accessed July 19,2023

[9]. https://digital.nhs.uk/data-and information/data-insights-and statistics/prescribing-and-medicines team Accessed July 19,2023

[10]. Kokane JV and Avhad PS (2016). Role of Pharmacist in Healthcare System, Journal of community health management;3(1): 37-40.

[11]. https://www.gov.scot/publications/towards-future-pharmaceutical-care/ Accessed July 19,2023

[12]. https://medicalandhealthcare.com/professions/pharmacology/regulatory pharmacist- education-career information.html. Accessed December 16,2023.

[13]. Nishant Verma, K. K. Jha, Rajesh Sharma, Shoor Sain Verma, Vinod Sharma, Randeep Singh, Ajai Kumar Singh. (2014) Role of Pharmacist in New Millenium, International Journal of Advance Research and Innovation;2(1): 177-180.

[14]. Green Pharmacy Practice Report for Pharmacist http://www.fip.org/bangkok2014/files/static/Draft_document_GREEN_PHARMACY_PRACTICE.pdfLast Accessed July 19,2023.

[15]. Yang TH, Scolaro KL, Dinkins MM. (2010) Raising awareness of medication disposal in professional schools. Journal of the American Pharmacists Association;50(4):444.

[16]. Abrons J, Vadala T, Miller S, Cerulli J. (2010) Encouraging safe medication disposal through student pharmacist intervention. Journal of the American Pharmacists Association;50(2):169.

[17]. Office of National Drug Control Policy. Proper disposal of prescription drugs. February 2007. http://www.whitehousedrugpolicy.gov/ publications/pdf/prescrip_disposal.pdf Accessed July 19,2023.