Preface

The question of healthcare reform and the improvement of the pharmaceutical care services have gained momentum attention over the last decade in response to the expansion of drug-related problems. Such problems have been complicated by the challenges that limit the capacity of Healthcare institutions to improve the safety, accessibility and reliability of evidence-based healthcare services. Especially in developing countries, the improvement of pharmaceutical care processes has been challenged by the inability to control the development of chronic conditions, prevent life threatening conditions, develop healthcare support systems, build partnerships with stakeholders (including patients), and manage costs. Such challenges originate from internal inefficiencies and external change agents such as change in demography and disease patterns, increasing costs of technologies, workforce problems, lack of public funding, the changing context of urban planning, and its impacts on maintaining health equality. In response to such challenges healthcare institutions are investing in implementing some organizational, institutional and technological interventions. Institutionally, there have been a shift in terms of the sites that provide healthcare services by migrating from acute inpatient hospitals (providing episodic care) to outpatient configurations (providing ongoing care) in response to the change of disease patterns from acute infectious diseases to chronic conditions. In addition, there has been some emphasis on the introduction of new healthcare and pharmaceutical providers and a considerable diffusion of Pharmacoinformatics applications and technologies to improve the functionality of pharmaceutical care core processes.

Pharmacoinformatics, as an emerging discipline, has the potential of making quantum leaps in the quality of pharmaceutical care services through the deployment of information systems for provision of pharmacy related decision support tools. Such tools are essential for the improvement of drug management, use and administration processes and the solution of drug-related problems. They are also necessary for improvement of patients’ knowledge about drugs administration and the consequences of adverse drug events. However, despite the successes here and there, many issues concerning the context of Pharmacoinformatics and its applications require additional analysis, experimental examination and research.

Firstly, there is still a need to theorize, crystallize and conceptualize the term itself and provide answers for questions like: “What is Pharmacoinformatics?” “What constitutes Pharmacoinformatics?” and “Is it Pharmacoinformatics or Pharmacy Informatics?” Little has been to focus of Pharmacoinformatics or “pharmacy informatics” with the aim of understanding its role in improving the efficiency and effectiveness of pharmaceutical care processes and patient-oriented outcomes and enhancing decision making at the operational, tactical and strategic levels in healthcare organizations. Over years, the have been some emphasis on the use of information systems in drug manufacturing processes such as drug analysis, testing and production. This orientation focuses more on the concepts of computer based manufacturing
that drive organization-wide “production information systems” but it provides a limited description of pharmacy management and pharmacy decision making. Considering the concept under the umbrella of biomedical and/or medical informatics moves the term closer to its decision support domain.

Secondly, there has been limited emphasis on understanding the context of Pharmacoinformatics in terms of its infrastructures, information processing environment, and the type of Pharmacoinformatics applications to be used. As a result, there has been some “selectivity” in the deployment of Pharmacoinformatics applications mainly for reporting and analyzing adverse drug events. The emphasis on the development of selected “evolutionary” pharmacy-related models has also been accompanied with a considerable failure to understand the roles and attitudes of “users” (such as physicians, pharmacists, nurses, laboratory personnel, and other healthcare professionals) and maximize the benefits from the emerging technology-driven business models.

This publication has been arranged into five parts with the aim of contributing to the abovementioned considerations. The first part is dedicated to the presentation of the contextual analysis of the domain of Pharmacoinformatics with emphasis on pharmacy management and pharmaceutical care systems and paradigms, analysis, definitions, methodologies, and interconnections. This part includes four chapters. In his work on the context of Pharmacoinformatics, Gasmelseid emphasized the centrality of the role of Pharmacoinformatics applications and technologies in the improvement of Pharmaceutical care processes. Stergachis et al used a case study approach to introduce a framework for using informatics for medicines management systems in resource-limited settings. Hugman examined communications in healthcare and proposed a number of strategies for addressing the shortcomings in areas such as information for patients and healthcare professionals, physician and pharmacist consultations, and the avoidance of medicinal and vaccination errors and crises. Postma and Hubben investigated the role of Pharmacoinformatics in enhancing the Pharmacoeconomics context of decision-making through the use of generalisable, transferable and accessible computer models for drugs management.

The second part includes four chapters that provide information about Pharmacoinformatics-oriented business models. Lin and Jalleh examined the key issues and challenges for managing and evaluating B2B E-Commerce projects within the Australian Pharmaceutical supply chains and their roles in setting up an infrastructure, which supports complex, multiparty Internet-based trading and transactions. Frattini et al. conducted an exploratory analysis on the role of platform biotech firms to examine the context of collaborations for innovation in the bio-pharmaceutical industry. In his work on cost-effectiveness analysis and the value for money of health technologies, Simoens reviewed and presented different approaches about cost effectiveness that enable decision making with regards to pharmacoinformatics technologies. Lin et al. used a multi-case study approach to investigate the practices and processes of B2B e-commerce evaluation and benefits realization and their impact on B2B e-commerce benefits and user satisfaction in Taiwanese hospitals.

The third part of this publication is devoted to the description of some of the methodologies, technologies and applications of pharmacoinformatics in pursuit of improving pharmaceutical care and patient-oriented outcomes. It includes nine chapters. Kevin Yap investigated the evolving role of Pharmacoinformatics in targeting drug-related problems in clinical oncology practice. His work also sheds light on the use of Pharmacoinformatics applications by healthcare practitioners and patients. Claudia and Hilgarth examined the context of clinical pharmacists’ intervention documentation in Germany using DokuPIK databases to demonstrate the improvement of drug therapy and the applicability of alternative strategies that can be used to reduce medication errors. Gasmelseid, proposed (in two chapters) a multi agent reference Pharmacoinformatics decision support model for the improvement of hospital management. In their
work entitled the healthcare factory, Cazzola et al. proposed a highly integrated system designed with the aim of improving the overall healthcare process management and of obtaining a flexible and deeper understanding of the patient treatment mechanisms. Col described the applications and challenges associated with the use of personalized decision support tools and models for the enhancement of patient choice. Chhanabhai examined the roles, benefits and disadvantages of social network sites in sharing health information by focusing on their corresponding privacy; security and ethical considerations. Butler addressed data integrity concepts and their use in pharmacy by highlighting relational models and relational database management systems. Chakraborty analyzed and interpreted the statistical methods used for analysis of safety issues within drug event combination.

The fourth part of this publication includes three chapters which reflect on the multidisciplinary context of Pharmacoinformatics and its linkages with other sciences. Muneer, Abdullah, and Zaman proposed an optimization methodology to identify protein coding regions in Eukaryotes. Shahid et al. linked the context of Pharmacoinformatics through the analysis of Pharmaco-EcoMicrobiology concepts and their potential role in medical and environmental sciences. Sridhar et al emphasized the role of informatics in biology and drug discovery by describing in silico pharmaco-gene-informatics identification of insulin like proteins in plants. Pharmacovigilance issues and concepts are covered in the fifth part of this publication. Pharmacovigilance—basic concepts and application of pharmacoinformatics are presented by Jose. Elkhawad examined the role of Pharmacovigilance Center in Sudan in reporting adverse drug reactions by focusing on its functionalities and challenges.

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