

BOOK REVIEW

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The value of systems and complexity sciences for healthcare: a review

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Overview

The analysis of healthcare systems by considering them as complex adaptive systems (CAS) (Holland 2012) is a new and emerging field. The key idea is based on the inherent complexity of healthcare systems—in terms of the dynamics, nonlinearity, and unpredictability (Lipsitz 2012).

While healthcare systems are naturally linked with CAS, there has always been a strong need for a compendium with a focus specifically on the needs of healthcare professionals and researchers. Here, we review the edited proceedings of the 1st International Conference on Systems and Complexity Sciences for Healthcare. This conference took place in the Washington DC, USA. The proceedings of the conference were published as a book titled “The value of systems and complexity sciences for healthcare” This book has been edited by Joachim P. Sturmberg.

Introduction to the Editor

Joachim P. Sturmberg is an associate professor of General Practice at the School of Medicine and Public Health, The University of Newcastle, Australia. He has published numerous books as well as articles.

Book review

Even though the book is an edited volume, the careful selection by the Editor allows for a very interesting read. The book helps the reader gain access to a comprehensive and integrated view of the domain. The focus being on developing a comprehensive understanding of not only the human organism but also the interconnectedness of individual's cognitive, physical, social, psychological, and cultural functioning.

The book is structured in two parts. The first part, consisting of 13 chapters and focuses on Complexity in Clinical Care. Whereas the second part, with 8 chapters, examines complexity and ethical issues in Healthcare System, Policy, Organizations, and Politics.

The first chapter of part one is an editorial overview of the domain. Subsequent chapters explain various approaches and results of studies by researchers from across the discipline. Chapters 2–3 discuss the transition from conventional human physiology to the holistic evolutionary human physiology. Chapters 4–5 discuss complexity and uncertainty of healthcare based on from studying epidemiology in family medicine. Chapters 6 and 7 argue how complex systems approach helps in improving safety and quality in healthcare. Monitoring variability and complexity at the bedside is discussed in chapter 8. Chapters 9–13 provide a view to mental health through the lens of complexity sciences. Chapter 14 provides an insight on ethical complexities in systems healthcare. Chapters 15 and 18 discuss the value of complex healthcare system supported by health informatics applications while chapters 16, 17, and 19 discuss Agent-Based Modeling of organizational performance and the role of CAS in an emergency department. Last two chapters provide a new paradigm in healthcare reform by incorporating CAS.

Critical comments

The book is quite interesting but it would have been even better if the editor would have chosen to expand the intended audience to consider people who may not have the basic background knowledge of complexity science. This is important because complexity science is a relatively newer domain and is still struggling to establish authenticity and standardization. One key thing missing by its very absence is basic background knowledge to bridge two very different domains, i.e. healthcare and CAS. This particular aspect is not presented in a clear form in this edited volume. As such, the book can be difficult to comprehend without developing an understanding of the terminologies and methodologies related to the core concepts of CAS/complexity sciences.

Conclusions

Despite its minor shortfalls, the book does cover a lot of material in a short space. It is therefore highly recommended to anyone interested in exploring complexity sciences in healthcare.

Authors' contributions

MN conceived the idea of the paper. FA, MN, and AY all read the book and wrote the review. All authors read and approved the final manuscript.

Competing interests

The authors declare that they have no competing interests.

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