Chapter 13
Causal Inference for Personalized Geriatric Well Being: A Bayesian Network Approach

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ABSTRACT

In today's digital world, recommendation systems are like smart tools that make our online experiences better. Personalized recommendation systems have become a powerful tool for people who would rather improve and control their own health in the ever-changing healthcare environment of today. Even in situations when an individual is on their own, these systems leverage the power of digital technology and data analysis to provide personalized guidance and support for a range of healthcare tasks. Personalized recommendation systems provide customized solutions that consider the unique requirements and preferences of single people, whether the

DOI: 10.4018/979-8-3373-4094-4.ch013

issue is managing mental health concerns, adhering to a balanced diet, managing chronic illnesses, or sustaining physical activity. By using these systems to their full potential, people may take charge of their health and well-being, making educated decisions and achieving their healthcare goals with more confidence and efficiency.

1. INTRODUCTION

The pervasive integration of digital technology has brought about a revolutionary transformation across various aspects of modern life, fundamentally altering how people engage with healthcare, manage their well-being, and access medical information. Central to this digital revolution are healthcare recommendation systems—advanced computer programs that are adept at extracting valuable insights from vast healthcare datasets. This chapter aims to shed light on the critical role of recommendation systems as indispensable digital companions, simplifying decision-making processes in healthcare and enriching users' interactions with health-related information. Grounded in machine learning principles, the research utilizes algorithms for predicting class outcomes and integrates digital twin technology, which creates replicas of real-world entities or objects. The subsequent section delves into the intricate significance of healthcare recommendation systems, placing particular emphasis on their economic impact on healthcare providers and institutions, underscoring how the quality of personalized healthcare suggestions directly influences patient satisfaction, promotes adherence to health protocols, and ultimately shapes the effectiveness and success of healthcare organizations. Furthermore, this research highlights the practical applications of healthcare recommendation systems, serving as catalysts for ongoing research and improvement initiatives within the medical field. The motivation for this research stems from the concept of tailored assistance in healthcare, where recommendation systems aim to enhance users' health outcomes and overall well-being. The paper outlines objectives focused on promoting patient independence, prioritizing preventive wellness measures, managing self-care, and fostering social connections through personalized healthcare recommendations. The primary goal of the research is to develop a personalized healthcare recommendation system aimed at improving individual health outcomes. The overarching objective is to enhance patient experiences, encourage engagement, and facilitate informed decision-making across diverse medical domains. By leveraging intelligent computer programs and integrating patient input and medical data, the healthcare recommendation system continuously refines its suggestions to align with individual health preferences and requirements closely. The statistical methodology employed in this research is causal inference, which elucidates relationships and cause-and-effect dynamics within the variables. The objective is to leverage digital twin tech-