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Chronic Care Model – A Secondary Publication

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Abstract: In recent years, the incidence rate of chronic diseases has shown a steady increase in every industrialized country. The almost logarithmic trend of the number of people living with chronic diseases is constantly on the rise. Each predictive statistical model indicates a strong impact on national health systems at the level of the organization of care and management costs. It is urgent to systematically introduce an evidence-based care model in chronic care management such as the Chronic Care Model. The Chronic Care Model is the reference model for WHO. The Chronic Care Model allows for personalized, holistic, multi-professional assistance, characterized by a strong humanization of care, preventive interventions, and relationships between healthcare professionals, patients, and caregivers as a system of care and assistance. The fundamental roles are social integration and the improvement of the quality of life of patients. The Chronic Care Model involves the use of a computerized system of information flow and telemedicine and trained healthcare professionals. The Chronic Care Model showed an improvement in the quality of life, a reduction in the number of hospitalizations, better adherence to therapies, and a reduction in costs.

Keywords: Chronic Care Management; Chronic Care Model; Chronic diseases; Governance; Integrated care

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1. Introduction

The progressive aging of the population will lead to a doubling of the elderly population by 2050: from the current 11% to 22% of the population. The turning point occurred in 2020 when the number of individuals aged 65 and over surpassed that of individuals aged 5 and under. If, in 2017, in most countries of the world, the ratio for those over 60 was 1:8, by 2030 the ratio will be 1:6 and by 2050 it will be even more pronounced, at 1:5 [1,2]. Within 20 years, the demographic trend will show a four-fold increase in people over 80 compared to the current trend. The Global Burden of Diseases, Injuries, and Risk Factors Study (GBD) in 2017 considered the incidence and prevalence compared to years lived with disability in a period from 1990 to 2017 [3]. The results showed a reduction in mortality rates, an increase in life expectancy, and consequently, an increase in the impact on healthcare systems of chronic conditions such as diabetes, neoplasms, and musculoskeletal and cardiovascular diseases. With the improvement of quality and the increase in life expectancy, chronicity

becomes part of daily life and is characterized by a progressive decline in autonomy, mobility, functional capacity, and social relationships, associated with an increased number of hospitalizations and the use of healthcare, social, and healthcare resources, with an average expenditure for the NHS equal to 70%–80% [4]. ISTAT data estimate that there are 2.6 million people with disabilities (4.8% of the Italian population), while 44.5% of them are over 80 years old [5], and almost 40% of the population suffers from at least one chronic condition (24 million people), half of whom have more than one chronic disease [6]. In Europe, chronic diseases account for 86% of all deaths, with significant healthcare expenditure amounting to around 700 billion Euros (EUR)/year [7]. In Italy, healthcare expenditure is around 66.7 billion EUR/year [6].

2. Chronic Care Model

Today's healthcare often fails to meet the needs of chronic patients. There are strategies to improve outcomes in people with chronic conditions classified into five different areas: (1) use of evidence-based planned care; (2) updating and organizing clinical and care practices; (3) empowering users with chronic conditions; (4) developing skills; (5) organization and utilization of clinical information. The integration of these components for the management, assistance, and treatment of chronic conditions is essential [8]. Patients with one or more chronic conditions have very complex needs and force healthcare systems to think about remodeling that produces personalized clinical care practices to meet the diverse needs of patients and their families [9]. Meetings focused on preventing exacerbations, flare-ups, and complications of the chronic condition are proposed by enhancing patient self-care. Over the years, there has been a complete overhaul of the assistance system for people with chronic conditions, starting from the care model proposed by Wagner in the 1990s: the Chronic Care Model (CCM) [10]. The CCM was developed as a method to improve care in the field of chronic diseases, identifying effective and appropriate components and strategies [11-14]. The CCM shows that the best outcomes are produced by the quality of the patient-healthcare personnel relationship, in those healthcare systems that exhibit these factors: (1) evidence-based processes that modify care; (2) empowerment and self-care enhancement [15]; (3) proactive action oriented towards user needs; (4) development and implementation of evidence-based guidelines, promoting their use and dissemination through operator training; (5) facilitation of the development and management of information systems to provide performance feedback. The CCM includes six components that influence functional and clinical outcomes associated with chronic disease management [14]. The six components are shown in **Table 1**.

Table 1. Components of the Chronic Care Model

Component	Interventions
Healthcare system	Organizing healthcare delivery by providing leadership that ensures resources and removes barriers to care
Self-management support	Facilitating skills-based learning and patient empowerment
Decision support	Providing guidance for evidence-based care implementation
Delivery system design	Coordinating care processes
Clinical information systems	Monitoring progress through outcome feedback to patients and healthcare providers
Community resources and policies	Supporting care using community-based resources and public health policies

These components of the CCM create more effective healthcare systems that support healthcare professionals' decision-making processes, connect healthcare systems to community resources and policies,

and provide comprehensive self-management support services for patients, with outcome monitoring through complex computer systems. The CCM model is proactive in intercepting healthcare and treatment needs [16], where the patient plays a role in managing their own psycho-physical condition [14]. CCM care is directed towards individuals, groups, and communities, through a network of services that, to be effective and measurable, must have (1) safety; (2) effectiveness; (3) timely response; (4) problem-solving capacity; (5) resource consumption; (6) patient-centeredness; (7) equity in service delivery [17]. The CCM organizes care in terms of continuity of care, relationship, organization, and information, preventing short-term hospital readmissions in the elderly with chronic diseases [18], with a lower workload for healthcare professionals and facilities, less stress for patients and their families, and lower healthcare costs [19], with the user's perception of being accompanied in a unique and continuous process, which also positively impacts better compliance with prescribed therapeutic adherence agreed upon with the healthcare team [20]. The CCM uses humanization of care, incorporating the perspective defined as "patient experience," meaning feeling accompanied in a unique and continuous process, which also positively impacts better compliance with agreed therapeutic adherence with the healthcare team [21]. An important aspect of public health is the field of prevention, and the CCM programs interventions through dynamic computer systems, involving financial and economic structures of health policy for investment and expansion of territorial services [22,23]. The conclusions of meta-analysis authors focusing on patients with type 2 diabetes mellitus indicate generally positive results with CCM, with more promising results obtained in studies with limited follow-up (< 1 year) and with programs that include more than two components of the CCM [23]. Other authors show how the chronic disease management approach with CCM in patients with heart failure significantly reduces mortality, with positive effects on quality of life and reduction of hospital stay duration [23]. In a recent systematic review [24], results show better outcomes in terms of blood pressure management and mortality in systems organized with Nurse-Led Care and Pharmacist Care; these models are included in the CCM, along with patient engagement [25]. The CCM has been adopted by the World Health Organization (WHO) as a guidance document based on evidence of effectiveness in improving the four basic elements necessary for the delivery of high-quality chronic care, such as self-management support, organization system design, clinical information and informatization systems, and decision support.

3. Expanded Chronic Care Model

An evolution of the CCM is the Expanded Chronic Care Model (ECCM). The ECCM is a modified and expanded model of the CCM, which began to be discussed in the 2000s by a group of Canadian researchers [24]. The ECCM also extends to the social inclusion of individuals with chronic conditions, aiming to create social environments capable of ensuring safe, stimulating, enjoyable, and satisfying living conditions. Health improvement and well-being are contributed to by disease self-management and the ability to spend leisure time pleasantly through recreational activities classified as essential for maintaining psycho-physical health [26-31]. Some authors provide recommendations for improving the social inclusion of people with disabilities [32], enabling these groups to access recreational services and benefit from them.

4. Chronic Care Management

Modern chronic disease management entails several key components: (1) collaborative partnerships; (2) evidence-based interventions; (3) outcome measurements and intervention evaluations; (4) communication of outcome information among team members and between healthcare team and patient; (5) self-care and patient empowerment. Patient involvement as partners enables improvement in patient-centered outcomes [33]. Alongside

Chronic Care Management, other models have been developed, including case management, integrated care, care coordination [34,35], and disease management.

5. Chronicity at the international level

During the United Nations meeting on chronic diseases in September 2011, world leaders committed to adopting common actions for the prevention of these diseases, recognizing their global impact as one of the major challenges for social and economic development in the twenty-first century. All governments were therefore asked to develop multi-sectoral plans for the prevention and control of chronic diseases, with declared national objectives and interventions. In August 2020, the World Health Assembly designated the years 2020–2030 as the Decade of Healthy Ageing [24,26,36,37]. The European project resulting from the agreements and provisions given by the United Nations is called Good Practice for Chronic Disease Join Action (CHRODIS-JA), aiming to counteract chronic diseases and ensure better aging through the use of a web platform accessible to health professionals, policymakers, and citizens. The system mainly addresses major chronic diseases such as diabetes, cardiovascular diseases, and stroke [38].

6. Application of the CCM in the field of chronic kidney disease

As seen, the CCM model is characterized by several factors, which can be divided into two aspects: (1) an informed and aware patient; (2) proactive teams that intervene early in intercepting people with renal damage in the initial stages, as highlighted in the Ministry of Health's Government Program [39-41]. In this document, the key points are, on one hand, prevention, encouraging citizens to adopt a more responsible and aware behavior through health education, and, on the other hand, the training of general practitioners (GPs), pediatricians, specialists, and healthcare personnel, to early identify individuals at increased risk for chronic kidney disease, directing them towards integrated care pathways. The Guidelines of the Federation of Associations of Hospital Internists Directors (FADOI) 2015 recommend screening interventions in certain patients with suspected kidney disease (e.g., obese individuals, those with diabetic disease, etc.), as well as informing and involving the patient and their caregivers in all stages of the disease care process [42].

7. Interventions on healthcare providers and patients

Educational interventions can lead to improvements in the quality of life of patients, as highlighted by Garcia Montes *et al*. in 2020 [43], who showed a correlation between active coping strategies and life satisfaction in both hemodialysis patients and kidney transplant recipients. Multiprofessional strategies with motivational interviews and the identification of non-compliant patients are essential in managing such patients and in therapy adherence. It is important to work on the communication setup between users and healthcare providers. One of the techniques supported by the literature is the use of the teach-back method, which involves constant patient feedback on practices and actions to follow, to maximize their understanding of the disease and promote knowledge, adherence, self-efficacy, and self-care skills [44]. Other proactive interventions may include the use of integrated electronic tools such as Electronic Health Records (EHRs) in the care and management of follow-up in patients with chronic kidney disease. The study conducted by Sequist *et al*. in 2018 highlights that the use of these tools improves patient engagement in therapy for chronic kidney disease [45]. These data show how a combined program of electronic tools along with increased involvement of healthcare providers and patients can improve certain areas of chronic kidney disease care.

8. Conclusions

In recent years, the incidence rate of chronic diseases has shown a steady increase in every industrialized country, and chronic kidney disease is no exception. Today, predictive statistical models indicate a strong impact on national healthcare systems in terms of care organization and management costs. Due to these data, it is necessary to introduce the CCM care model, considered by the WHO as the reference model for managing chronic diseases. It is based on scientifically validated interventions and involves the use of an information flow computerized system, all conducted by adequately trained healthcare professionals. Staff training is aimed at improving teamwork skills, including caregivers in the care plan for chronic patients, and intercepting, preventing, and meeting the needs of the individual and the community. All this allows for the delivery of personalized, holistic, and multi-professional care, characterized by a strong humanization of care and prevention interventions, and relationship building among healthcare professionals, patients, and caregivers as a care and assistance system, resulting in improved patient outcomes and quality of life. The application of the CCM can therefore be considered a priority model to be implemented in the healthcare systems of every country. The CCM can be considered a proactive healthcare model that anticipates the necessary interventions to prevent the worsening of the disease and thus represents a priority model to be implemented in the healthcare systems of every country [46].

Disclosure statement

The authors declare no conflict of interest.

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