

Heavy pathologies: A reflection on models of care and efficient management

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Abstract:

Chronic diseases are a major challenge for health systems due to their increasing prevalence and considerable socio-economic impact. This article offers an in-depth analysis of the fundamental concepts related to chronic diseases, highlighting their main characteristics, the risk factors associated with them and the multidimensional approaches to their classification. Particular attention is paid to theoretical frameworks and health models for studying these pathologies, with the aim of structuring appropriate and effective management strategies.

The study also examines chronic disease management and management models with a view to optimizing available resources and improving coordination of care. Through an analytical and empirical approach, this article aims to identify the strategic levers to ensure efficient care, taking into account the requirements of modern health systems and the specific needs of patients.

Keywords: chronic diseases; management; chronic disease management; health models; risk factors

Jel Classification Codes: I10 – I12- I18

Introduction

The management of severe pathologies is a major challenge for modern health systems, due to their complexity and multidimensional impact. These conditions, which encompass chronic diseases such as cancer, cardiovascular disease, diabetes and neurodegenerative conditions, are characterized by their slow progression, prolonged duration and medical, social and economic repercussions, require a holistic, integrated and multidisciplinary approach to improve clinical outcomes and patients' quality of life. Their weight is considerable, both for the individuals directly affected and for their families and health systems, generating significant socio-economic pressure. These

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diseases, often associated with multiple risk factors such as lifestyle habits, genetic predispositions and environmental factors, require an effective and sustainable management approach. The management of these diseases requires considerable human and material resources, involving health professionals, family caregivers, social structures, and often costly technological advances. Faced with these challenges, it becomes imperative to conduct an in-depth theoretical analysis, aimed at shedding light on the foundations and limits of current approaches. This reflection leads to the following problem: **How do chronic disease management and management models improve the control of these diseases and their impacts at different levels?**

This article aims to explore the conceptual frameworks underlying the management of severe pathologies, it is crucial to adopt a multidimensional approach to better understand the fundamental concepts related to chronic diseases, identify their main characteristics and classify these pathologies according to relevant criteria. The development of specific health models and adapted theoretical frameworks is essential to ensure optimal care, taking into account the complex needs of patients and the constraints of health systems, in order to promote global understanding and more effective management.

I. CONCEPTUAL FRAMEWORK

1 -Definition of serious pathologies:

The definition of chronic pathology varies depending on the point of view and the purpose of use of the term. So, if the health professional and the user will often favor an approach by pathology and by the causes of chronic pathologies, It is very likely that the decision-maker, the payer and the financier will opt for a different approach would offer the possibility of meeting the highest needs of many people concerned, By addressing the issue through adaptation a transversal and original approach.

There are divergent views on the definition of chronic disease, which can have a significant impact on the assessment of consequences, needs and the implementation of programmes to improve patient management.

Some are not expected to be serious diseases, as their impact on life expectancy is limited, however, in almost all situations, chronic disease causes lasting changes in the psychological, social and economic aspects of an individual's life.

Here we propose an approach to chronic disease that may be beneficial to public health.

-According to (WHO), chronic diseases are long-term conditions that usually progress slowly and require long-term treatment and care. (OMS, 2024)

However, this definition lacks precision .Many diseases share similar characteristics, risk factors and consequences.

-According to (CDC), They define as non-communicable conditions, of long duration, which do not heal spontaneously and are rarely curable (Anne-Christine, 2010)..

This restriction is no longer really justified given the significant advances in the treatment of certain communicable diseases. The increased effectiveness of treatments makes it possible to considerably slow down the progression of these diseases, thus transforming them into chronic conditions.

For the (EESC), the definition of chronic diseases must take into account the consequences they entail for patients and society. It is only under this condition that the answers can be up to the challenges of public health. The EESC thus adopts the transversal definition selected by the High Council for Public Health.

-In 2009, the High Council for Public Health (HCSP) defined a disease, or more generally a "chronic condition", as follows:

- The presence of a persistent physical, psychological or cognitive pathological condition is required.
- A minimum duration of three months, actual or presumed.
- An impact on daily life including at least one of the following three elements:
 - has a functional barrier to activities or social participation.
 - addiction to a drug, diet, medical technology, device or personal aid.
 - A medical-social care pathway may require medical or paramedical care, psychological assistance, adaptation, monitoring or specific prevention.

The definition takes into account the complete situation of individuals with consideration of the medico-social aspect of the disease. It responds to the imperative to consider, from a public health perspective, the evaluation of epidemiology aims to assess the needs (medical and medico-social) of patients and their relatives, as well as the evaluation of the costs to society associated with cancers (Chassang, 2019).

Therefore, to establish a universal definition of a chronic disease, it is necessary that it meets several essential criteria: severity, cause, duration, course of the disease, in particular with regard to the possibility of recovery or relapse, and the repercussions and in particular the influence on the functioning of the person, his quality of life in the social field and his career.

3-Risk factors associated with chronic diseases:

3-1-Risk behaviours : Smoking, sedentary lifestyle, unbalanced diet and excessive alcohol consumption. These behaviors increase the risk of cardiovascular disease, diabetes, and other chronic conditions (Myers, 1995)

3-2-Genetic factors: A genetic predisposition can influence the occurrence of diseases such as type 2 diabetes or certain types of cancer (Meng, 1999)

3-4-Mental Health : Depression and anxiety are common risk factors, particularly in co-occurrence with chronic diseases like heart disease (Lotfaliany, 2018)

3-6-Social and Economic Inequality: Low-income populations are more exposed to risky behaviours and have limited access to care (Glover, 2004)

4-Classification of Chronic Diseases: Multidimensional Approach

Chronic diseases can be classified into different categories according to their characteristics and origin. Here is a summary of the classification of chronic diseases based on recent research:

4-1-Biological classification:

-Noncommunicable diseases (NCDs): These diseases, such as diabetes, cardiovascular disease, and cancer, are usually caused by behavioral and environmental factors such as smoking, obesity, and sedentary lifestyles (Aldhyani, 2020)

- Chronic communicable diseases: These include conditions like HIV/AIDS and some hepatitis. These diseases, although caused by infectious agents, persist over the long term and require ongoing management (Jen, 2012)

4-2-Classification according to the affected systems:

Based on specific organ systems: respiratory system (asthma , Bpco), cardiovascular (heart failure, hypertension), or musculoskeletal (arthritis, rheumatoid arthritis, osteoporosis) (Barke, 2022).

4-3-Classification based on chronic pain:

Recognized as a separate entity in the International Classification of Diseases (ICD-11), Recognizes chronic pain as a separate disease and classifies it as neuropathic, inflammatory or mixed pain (Barke, 2022)

4-4-Epidemiological classification:

Based on public health data: Prevalence in different regions, socio-economic impact, Example: Using artificial intelligence data to classify chronic diseases according to their risks. (Rakhimov, 2022)

4-5-Classification by duration or intensity:

4-5-1 Acute diseases progressing to chronicity : Some infections or inflammations become chronic. (e.g., hepatitis B)

4-5-2 Immediate Chronicity : Diseases diagnosed from the outset as chronic (type 1 diabetes, multiple sclerosis (Feinstein, 1970)

VI-Health models to study chronic diseases:

The study of these diseases requires the use of specific health models that aim to explain the determinants of health, the interactions between biological, social and environmental dimensions, and their implications in chronic diseases. These models provide a better understanding of the underlying mechanisms of chronic disease and inform public health policies and treatment strategies.

1-Biomedical model:

The **biomedical model** has historically dominated the understanding of chronic diseases, focusing primarily on biological causes and medical treatments. However, this model has been criticized for its reductionist

approach, which neglects the social, psychological and behavioral dimensions of diseases (Engel.L, 1977).

In addition, biomedical models do not always take into account the socio-economic factors that influence the progression of chronic diseases, which limits their effectiveness in public health contexts

2-The biopsychosocial model:

To overcome the limitations of the biomedical model, the **biopsychosocial model**, introduced by Engel (1977), integrates the biological, psychological and social dimensions of health. This model is particularly relevant in the context of chronic diseases, where individual behaviours and social environments strongly influence disease progression (Borrell-Carrió, 2004) . For example, therapeutic education and psychological support for diabetic patients have been shown to be essential to improve their quality of life and reduce complications.

3-Ecological health model:

The **ecological model** highlights the influence of physical and social environments on the health of individuals (Owen, 2015). It is particularly useful for analyzing health disparities and identifying interventions that target social determinants, such as access to healthy food, physical activity, and primary health care (Glass, 2006). Community-based initiatives to change the local environment have shown positive results for chronic disease prevention, such as reducing cardiovascular disease through group exercise programs (Huang, 2009)

II-Theoretical framework of care:

Epping-Jordan et al (2004) In their analysis of chronic care, these authors emphasize the need for integration between policy management and individual care. This could serve as a basis for distinguishing concepts. (Epping-Jordan, 2004)

The care, management and management of chronic diseases are closely related but distinct concepts, reflecting different dimensions of the overall approach to these long-term conditions.

1-1-Control of Chronic Diseases:

Chronic disease management encompasses all care and services designed to help individuals with long-term conditions effectively manage their condition, maintain or improve their quality of life, and prevent complications. According to the National Academy of Medicine, this management requires a patient-centered approach, including prevention, therapeutic education, and interprofessional coordination, with a central role assigned to the general practitioner (Godeau, 2016) .

Bodenheimer et al. (2002) emphasize that the active involvement of patients in their own management is crucial to improve health outcomes. Interventions like therapeutic education help patients better manage their condition (Bodenheimer T. L., 2002).

So we can say that the management of chronic diseases refers to the individualized care provided to a person to improve their quality of life, prevent complications, and maintain optimal health.

1-2-Management of Chronic Diseases:

García-Lizana and Sarriá-Santamera (2007) explain that chronic disease management requires well-structured systems to organize care, including the use of digital technologies to track patients at scale (García-Lizana, 2007).

On the other hand, chronic disease management focuses on the planning and organization of resources and services at a systemic level. This includes implementing health policies, monitoring epidemiologies, and developing prevention and treatment programs.

1-3 Chronic Disease Management:

Wagner et al. (1996) describe the Chronic Care Model, which relies on active collaboration between the patient and health systems to optimize outcomes , this paper describes **management** as a combination of individual and organizational practices. While this implies a difference from purely systemic management or individual management, this distinction is not explicitly theorized. It can be concluded that chronic disease management combines individual and systemic approaches to effectively coordinate care between patients, healthcare professionals and institutions. It includes strategies like self-management, collaboration between care teams, and data integration for personalized care.

Appearance	Care	Management	Management
LEVEL OF ACTION	Individual (patient)	Systemic (public health, institutions)	Collaborative (Individual + Systemic)
Main Objective	To improve the patient's quality of life	Plan and organize resources	Coordinate care for optimal outcomes
Actors involved	Doctors, nurses, patients	Policy makers, health administrators	Patients, healthcare professionals, institutions
Key example	Treatment of a diabetic patient	Establishment of a National Diabetes Registry	Program combining self-management and professional follow-up

The source: carried out by us according to literature review

It all depends on our ability to distinguish between definitions and concepts. Thus, we can conclude that the classification of the models depends on the adequacy with these definitions:

2-Models for the management of chronic diseases:

2-1 Middle-Range Theory of Self-Care of Chronic Illness:

This theory, proposed by Riegel, Jaarsma and Stromberg, is specifically focused on self-management of patients with chronic diseases. It distinguishes three main processes:

Self-Care: Daily practices to maintain health.

Self-Care Monitoring: Recognizing and interpreting changes in health.

Symptom Management (Self-Care Management): Respond appropriately to detected symptoms.

This model emphasizes the importance of patients' active engagement in their care to reduce complications and improve their quality of life (Riegel, 2012).

2-2 Health Belief Model (HBM):

The **Health Belief Model** explores how an individual's beliefs influence their health behaviour. This model is often used to promote adherence to treatments in chronic diseases. Key concepts include:

- **Perceived Susceptibility** : Personal belief of the likelihood of contracting a disease.
- **Perceived severity** : Estimated consequences of illness.
- **Perceived benefits** : Effectiveness of the proposed actions.
- **Perceived barriers**: Barriers to action.

It is widely used in behavioral interventions, such as therapeutic education (Rosenstock, 1974).

2-3- Theory of Planned Behavior (TPB):

The **Theory of Planned Behavior**, developed by Ajzen, focuses on a person's intention to engage in a specific behavior. This intention is influenced by three factors:

Attitude : Personal opinions about behavior.

Subjective standards : Perceived influence of others.

Perceived behavioral control : Perceived ease or difficulty in performing the behavior.

It is used in programs to encourage self-management and adherence. (Ajzen, 1991)

2-6- Behavioral Change Wheel (BCW):

The **Behavioral Change Wheel** is a framework that helps design behavioral interventions. It identifies the factors that influence change:

- **Motivation**
- **Capacity** -
- **Opportunity**

This is a recent model used in chronic care to design tailored programs. (Michie, 2011)

3-Models for the management and management of chronic diseases:

3-1 Chronic Care Model (CCM):

The **Chronic Care Model (CCM)**, developed by Edward Wagner and his team, is an organizational framework designed to improve the care of patients with chronic diseases. This model highlights six key components:

1. Support systems for self-management.
2. Care delivered by multidisciplinary teams.
3. Integrated clinical systems to facilitate follow-up.
4. Decision support for practitioners.
5. IT tools to manage data.
6. Organizational policies that promote continuous improvement.

The CCM is designed to transform traditional emergency-centered care into proactive, planned care (Wagner, 1996).

3-2- Integrated Chronic Disease Management Model (ICDM):

This model expands CCM by integrating community-based approaches to treat chronic diseases. highlights

1. Coordination between primary health care and community services.
2. Managing the social determinants of health.
3. Active engagement of patients and families.

It is particularly relevant in low resource contexts. (Epping-Jordan, Improving the quality of health care for chronic conditions, 2004)

Appearance	Models for studying chronic diseases	Models for the care /management/management of chronic diseases
Main Objective	Understand the determinants, prevalence, course, and impacts of chronic diseases.	Provide integrated, continuous, patient-centered care to effectively manage the disease.
Methodology	Quantitative (epidemiology, statistics), qualitative (interviews, focus groups) or mixed.	Systemic approach integrating different levels of care (prevention, treatment, follow-up).
Analysis Targets	Individual, social, environmental, and economic factors influencing the disease.	Patient, family, health system and professionals involved in care.
Focus Level	Population: studies global or specific trends in the population.	Individual: taking into account the patient's needs and preferences
What are some examples of Models?	- Epidemiological model- Biomedical model- Ecological model of health	- Chronic Care Model - Patient-Centered Model - Integrated Model of Care

Use of data	Research data (surveys, registries, public health databases).	Clinical data (medical records, patient follow-up).
Expected Impact	Identification of risk factors and prevention strategies.	Improved quality of life and reduced complications or costs.
Concrete examples of application	Studies on the prevalence of cancers or cardiovascular diseases in a region.	Care management programs for diabetics or cancer patients.
Main Limits	May lack immediate applicability at the individual or clinical level.	Depends on resources, infrastructure and coordination between actors.

The source: Carry out by us according to the literature review

III-The challenges of chronic diseases:

Chronic diseases create a wide range of challenges that require structured and methodical analysis. For better understanding and targeted intervention, these challenges can be categorized according to the dimensions of care, management and management. This approach makes it possible to prioritize the issues, assess their level of impact and identify the specificities of each issue, thus promoting the development of integrated, effective strategies adapted to the complex needs of patients and health systems.

1. Chronic Disease Management: Clinical Challenges:

a) Polypathology and complex treatments:

The coexistence of several pathologies (polypathology) often complicates the implementation of treatments. Patients with multimorbidity frequently receive multiple prescriptions, increasing the risk of drug interactions and adverse side effects. In addition, some therapeutic recommendations for a given pathology may be contradictory with those of another pathology in the same patient (Boyd et al., 2005). This complexity requires close coordination between different healthcare professionals and a patient-centered approach to prioritize therapeutic interventions (Boyd, 2005)

b) Mental and social comorbidities:

Mental disorders such as **depression** and anxiety, often present in chronic patients, increase the complexity of care, affecting their **adherence to treatment** and **quality of life**. (Moussavi, 2007)

c) **Pain management**

Pain control is a major challenge, especially for serious chronic diseases like cancer. Pain management requires a **multidisciplinary approach** (Andréanne Bernier, 2024)

2. **Chronic Disease Management: Organizational Challenges:**

a) **Coordination between health actors:**

Communication between health professionals is often insufficient, leading to **fragmented management**. Coordinated care is key to improving clinical outcomes. (F. Pédrot, 2019)

b) **geographical and socio-economic disparities**

Disparities in access to care, particularly in rural areas and for disadvantaged populations, exacerbate health inequalities. (Gentil, 2012)

c) **Human resource and training**

The lack of **qualified staff** and **continuing education** programs for healthcare professionals makes it difficult to adapt to the growing needs of chronic patients. (Rothier-Bautzer, 2015)

d) **Data management and e-health:**

Information technology integration and **health data management** are crucial for long-term patient monitoring. The lack of an **effective digital infrastructure** can limit the effectiveness of care. (Kruse, 2018)

3. **Chronic Disease Management: Strategic Challenges:**

3-1-Financing and Sustainability:

Health systems need to respond to the **rising costs** of chronic diseases while maintaining accessible, quality care. This involves rethinking economic models of health. (Santé, 2010)

3-2-Patient self-management and empowerment:

Self-management programs are key to reducing care costs while improving patients' quality of life. However, empowering patients requires constant support and appropriate educational resources ((OFSP), 2018).

3-4-Implementation of public health policies:

Governments need to develop public health policies that promote chronic disease management on a national scale. This includes programs to prevent and reduce inequalities in access to care (Prévention, 2022).

3-6-Policy and regulatory barriers:

Health legislation and policies can act as a brake on the adoption of innovative solutions for chronic disease management, due to competing priorities and budget constraints ((OMS), 2003) .

3-7-Inequality in access to research and innovation:

Unequal access to innovation in treatments and technologies can lead to inequalities in chronic disease management. A better distribution of research resources and funding is needed (Santé(OMS), 2024).

Current strategy for the control of chronic diseases in Algeria:

Algeria has put in place a set of targeted strategies to combat chronic diseases, as part of its national health policy. These initiatives are part of a comprehensive and multisectoral approach, aimed at strengthening prevention, early diagnosis and patient management at the national level. This approach is based on a combination of preventive, curative and educational actions, aligned with international public health recommendations.

1- Prevention and awareness-raising

Prevention is a key pillar of Algeria's strategy. Awareness campaigns are regularly organized to inform the population about risk factors such as obesity, smoking and sedentary lifestyles. These campaigns aim to inform the population and promote healthy behaviours through mass media and community-based actions. (Abdiche, 2023)

Critical:

Although awareness campaigns are a good starting point, they remain ad hoc and lack continuity and effective targeting, especially in rural areas. The lack of evaluation of results limits their impact.

Example of success:

The Change4Life programme in the UK used an integrated approach by combining media, school education and local initiatives for more effective prevention. (Crocker, 2012)

2- Medical care and access to care:

One of the major objectives of the national strategy is to ensure equitable access to care for all patients with chronic diseases. Specialized centers, such as the diabetology units of the Tizi-Ouzou University Hospital, have been created to offer personalized follow-up. In addition, the social coverage system via the *Chifa* card allows patients to benefit from partial or full reimbursement of their treatments, thus reducing the financial burden on families (Ben Kerri, 2019)

Review:

However, geographical disparities persist, with medical infrastructure concentrated in large cities, making it difficult for rural populations to access care

Success story:

Canada has adopted an integrated primary care model where multidisciplinary teams provide continuous care to patients regardless of where they live. (Hutchison, 2011)

3- Integration of health technologies:

The digitalization of the health system is a major challenge for the management of chronic diseases. Currently, Algeria is lagging behind in the integration of electronic medical records and telemedicine platforms. The lack of digital solutions hampers ongoing patient monitoring and limits coordination between HCPs (Mebtoul, 2003).

Critical:

The integration of these technologies remains limited to certain urban areas, and their adoption by health professionals is still insufficient. To improve this component, initiatives inspired by international models, such as the Estonian electronic medical record system, could be considered to ensure better remote patient management and personalized follow-up.

Success story:

Sweden has set up telehealth platforms that allow effective remote monitoring of patients with chronic diseases. (Frennert, 2024)

4- Access to medicines and pharmaceutical partnerships:

The Algerian state collaborates with local pharmaceutical companies, such as the *Saidal* group, to ensure the production and availability of essential medicines. (Djelouat, 2024)

Review:

Frequent shortages of certain drugs are observed, and import dependence persists despite local production efforts.

Success story:

India has managed to develop a self-sufficient pharmaceutical industry by encouraging local production and investing in research and development. (India, 2016)

5- Collaboration with the international organizations; and

Algeria is collaborating with WHO to develop strategies for the control and prevention of chronic diseases following international recommendations ((OMS), Stratégie de coopération de l'OMS avec l'Algérie 2016-2020., 2016).

Review:

Although partnerships exist, their concrete implementation at the local level remains limited by administrative and budgetary obstacles.

Success story:

Rwanda has used international partnerships to strengthen its local health care capacity and improve chronic disease management. (Organization(WHO), 2018)

6- Training and capacity building of health staff:

Continuing education sessions are organized for medical staff to improve their skills in chronic disease management. (Tahrour, 2019)

Critical:

These training courses remain insufficient and do not cover all the specialties necessary for optimal care.

Example of success:

Canada has established continuing education initiatives and professional development programs in the health sector in Canada, including telemedicine and e-learning (Borycki, 2024)

Conclusion:

In conclusion, the management of severe pathologies and chronic diseases is a major challenge for modern health systems, both at the level of individual care and at the level of public health policies. Current approaches, while relevant, require continuous revision to better meet the needs of an aging population and increasingly complex socio-economic challenges. The integration of theoretical models and innovative management strategies, such as telemedicine or self-management models, could improve patient management by ensuring more personalized and effective follow-up. It is essential to promote a collaborative approach between the different actors of the health system, strengthening the coordination of care and reducing inequalities of access. Ultimately, the implementation of appropriate and well-coordinated strategies, supported by investments in infrastructure and training, will improve not only the quality of life of patients, but also the efficiency of health systems in the face of the rise of chronic diseases

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