

Review

Continuity of care: models and pillars. Findings of a literature review

Continuità assistenziale: modelli e pilastri. Risultati di una revisione della letteratura

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Key words: care models, continuum of care, integrated care

SUMMARY

Objectives: the aim of this study has been to review international models and approaches supporting the continuum of care and to identify their main focuses.

Methods: a narrative review was performed on Pubmed using the inclusion criteria: continuity of care models application with particular reference to chronicity, comorbidity, disability or frailty areas; systematic reviews written in English or Italian.

Results: from 129 initial records, 22 studies were selected. Within these, the most commonly treated is the integrated care model, analysed by 41% of the studies. Moreover, the presence of pillars (founding elements) common to multiple models emerged: “patient engagement and empowerment” (86% of the studies); “multidisciplinarity” (73% of the studies); “coordination of care” (50% of the studies) and “case management” (50% of the studies).

Conclusions: the key elements and pillars of the analysed continuum of care models are all interconnected and have to be considered as a part of a holistic care process that aims to respond to the different and complex patient’s health needs. Continuity of care requires the delivery system to adopt a primary health care orientation emphasising the comprehensiveness of the care process and the overall health of the patient and implementing multicomponent and multilevel interventions based approaches.

Parole chiave: modelli assistenziali, continuum assistenziale, assistenza integrata

RIASSUNTO

Obiettivi: lo scopo di questo studio è stato quello di analizzare i modelli e gli approcci descritti a livello internazionale a sostegno della continuità assistenziale e identificarne le principali caratteristiche.

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Metodi: a tale scopo è stata eseguita una revisione narrativa su Pubmed utilizzando i criteri di inclusione: applicazione di modelli di continuità assistenziale, con particolare riferimento agli ambiti della cronicità, comorbidità, disabilità o fragilità; revisioni sistematiche pubblicate in inglese o in italiano.

Risultati: a partire da 129 record iniziali, sono stati selezionati 22 studi. All'interno di questi, il più comunemente trattato è il modello assistenziale integrato, analizzato dal 41% degli studi. Inoltre, è emersa la presenza di pilastri (elementi fondanti) comuni a diversi modelli: rafforzamento e coinvolgimento del paziente (86% degli studi); multidisciplinarietà (73% degli studi); coordinamento assistenziale (50% degli studi) e "case management" (50% degli studi).

Conclusioni: gli elementi chiave e i pilastri dei modelli di continuum assistenziale analizzati sono tutti interconnessi e devono essere considerati parte di un processo di cura olistico che mira a rispondere alle diverse e complesse esigenze di salute del paziente. La continuità dell'assistenza richiede che il sistema di erogazione adotti un orientamento alla primary health care che enfatizzi la completezza del processo assistenziale e la salute complessiva del paziente e implementi approcci basati su interventi multicomponente e multilivello.

Introduction

The progressive tendency for the age structure of the population to shift towards the elderly has been observed over the years in all developed countries and had important implications for health, society, economics and epidemiology. The median age of the European population is gradually increasing being 43.7 years on 1st January 2019. The highest median age (46.7 years) has been registered in Italy, confirming its relatively old population structure (1). It has been estimated that in this country, by the year 2050, 34.6% of the population will be aged more than 65 years (2). Cardiovascular disease, osteoporosis and dementia are common chronic conditions at older age, while osteoarthritis, diabetes, and related mobility disability increase in prevalence as the population ages and becomes more overweight (3). The increasing prevalence of chronic diseases faced by both developed and developing countries is of considerable concern to a number of international organisations (4).

Older adults with multiple chronic conditions complicated by other risk factors, such as deficits in activities of daily living or social barriers, experience multiple challenges in managing their healthcare needs, especially during episodes of acute illness (5). In this context, it is of paramount importance the continuum of care, which is a concept involving an integrated system of care that guides and tracks patient over time through a comprehensive array of health services spanning all levels of intensity of care (6).

Identifying effective strategies to improve care transitions and outcomes for this population is essential. Transitions of care are a set of actions to ensure patient coordination and continuity of care as patients transfer between different locations or levels. During transitions associated with chronic or acute illness, vulnerable patients may be

placed at risk with fragmented systems compromising their health and safety. In addition, poor care transitions also have an enormous impact on health care spending (7). As patients' health care needs can now only rarely be met by a single professional, multidimensional models of continuity have had to be developed to accommodate the possibility of achieving both ideals simultaneously (8). Integrating medical services may increase the quality of healthcare, enhance patient and patients' family satisfaction with healthcare services, and better contain healthcare costs (9).

Different models of continuity of care have been proposed, yet no single model of care coordination has been proven to be universally applicable across patient (and disease) populations (10). The aim of this study has been to review international models and approaches supporting the continuum of care and to identify their main focuses.

Methods

A narrative review was performed on the scientific database Pubmed in order to find out national and international journal articles focused on models and approaches supporting the continuum of care with particular reference to the areas of chronicity, multimorbidity, disability or frailty. The following free text search terms were used: "chronic disease", "continuum of care", "primary care", "secondary care", "care models". The search was limited to "title/abstract" and "humans" while the study type filter was set for "systematic review". The inclusion criteria were: continuity of care models application; systematic reviews written in English or Italian; focused on chronicity, comorbidity, disability or frailty conditions.

The identification of eligible studies was carried out on the basis of titles and abstracts of articles yielded by the search; the full text of all the potential papers was retrieved and read in order to identify the final works to be considered in the review. Data were entered into a spread sheet on Microsoft® Excel and collated in a table which, for each article, specified the author(s), title, year of publication, country of origin, description of the model and its main founding elements (pillars).

Results

The initial search yielded 129 records. The selection by title reduced the eligible articles to 39 and further evaluation by abstract brought the total to 33. Of these, after reading the full-text, 11 were excluded: 1 did not meet the study design; 4 did not meet the population of interest; 4 did not meet the intervention of interest; 2 did not meet the outcome of interest.

Of the 22 final studies selected, 13 were conducted in Europe (7 from UK (11-17), 1 from Italy (18), 1 from Ireland (19), 1 from Germany (20), 1 from Netherlands (21), 2 were conducted in more than two European countries together (22-23), 4 from

North America (2 from Canada (24-25) and 2 from USA (26-27), 4 from Australia (28-31) and 1 from China (32).

The included studies were published between 2011 and 2020.

In regards to the population of interest, 32% (7 out of 22) of the studies focused on patients with a specific disease and, in detail, 2 on heart failure (14,27), 1 on stroke and myocardial infarction (26), 1 on chronic obstructive pulmonary disease (21), 1 on multiple sclerosis (18), 1 on hypertension (17) and 1 on type 2 diabetes mellitus (22). Moreover, 27% (6 out of 22) focused on patients with chronic diseases in general (13,16,19,24,31-32) and 23% (5 out of 22) did not focus on any specific group of patients (12,15,20,28,30). Two studies focused on elderly patients with chronic diseases (11,25), while frailty and old age have been the focus of one study each (23,29).

Continuum of care models

Within the selected studies, the following models were analysed: integration of care in 9 studies (11-12,15-16,19-20,23,28,30)(41%); transitional care in 4 studies (24,26-27,29) (18%); disease management in 2 studies (14,21); self-management in 2 studies (13,17); chronic care model (22), patient-centred medical home model (31), system navigation model (25), telerehabilitation (18) and nurse led-discharge program (32) in one study each. In detail, the following results emerged.

Integration of care

The integration of care is an organising principle for care delivery that aims to improve patient's care and experience through improved coordination between primary and secondary care sectors (11,28). Models of integrated care are also defined as changes to health or both health and health-related service delivery which aim to increase integration and/or coordination (12). Integrated care has emerged as an effective way to improve outcomes for older people with chronic and complex care and support needs (23).

Multiple key elements emerged, like: self-management and patient education; shared access to records/information technology; management of discharge and of transition between care teams and settings; shared care guidelines or pathways and joint planning; involvement of carers and family members (11-12,15-16,19,20,23,28,30). The main pillars are: multidisciplinary; patient engagement/empowerment; coordination of care; case management; integration of health and social care (11-12,15-16,19-20,23,28,30). In few studies emerged also concepts like: process management (12,30), patient centredness (20) and clinician-patient relationship (20).

Transitional care

Transitional care is a broad term for care interventions that promote safe and timely transfer of patients between levels of care and across care settings (29). It is defined as “a set of actions designed to ensure the coordination and continuity of health care as patients transfer between different locations or different levels of care within the same location” (26). It might comprise an educational component, an initial contact post-discharge, multidisciplinary coordination, continuity of care through repeated contacts with the same healthcare professional, and increased accessibility to clinicians (24). The studies included analysed the transition from hospital to home of elderly or patients with chronic or specific diseases (ex: heart failure, stroke or myocardial infarction). The common key elements are: structured community-based follow-up; patient education about self-management; medication adherence and reconciliation; discharge assessment and planning; communication between providers and community-based support and services (24,26-27,29). The main pillars are: multidisciplinary, coordination of care, patient engagement/empowerment and case management (24,26-27,29). In few studies also emerged concepts like process management (26) and integration of health and social care (27).

Disease management

Disease management consists of a group of coherent interventions designed to prevent or manage one or more chronic conditions using a systematic, multidisciplinary approach and potentially employing multiple treatment modalities (21). The interventions consist in providing ongoing, direct support to patients post-discharge, facilitating earlier contact with specialists and improving symptoms monitoring (14). Disease management programs and interventions in people with heart failure (14) and chronic obstructive pulmonary disease (21) have been analysed. The main interventions are based on: self-management through patient's education; psychosocial support and holistic approach; structural follow-up and monitoring (often by nurses using agreed protocols) (14,21). The identified pillars are: case management, multidisciplinary and patient engagement/empowerment (14,21).

Self-management

Self-management support involves collaboration between the health-care professional and the patient so that the patient acquires and demonstrates the knowledge and skills required to manage his/her medical regimens, change his/her health behaviour, improve control of his/her disease and improve his/her well-being. Patient education alone is not sufficient; monitoring and assessment of progress is also essential (13). Self-management interventions have been analysed both for patients diagnosed with

chronic obstructive pulmonary disease (13) and with hypertension (17). The identified key elements of this model are: collaboration between the health-care professional and the patient based on patient education, self-monitoring and assessment of progress, feedback, reinforcement and behavioural support (13,17). The pillar common to both studies included is the patient engagement/empowerment, which in some cases (17) can be supported by digital health.

Chronic care model

The chronic care model comprises six interrelated components deemed essential for providing high-quality care to patients with chronic disease: healthcare organisation; self-management support; decision support; delivery system design; clinical information systems and policies. Chronic care programmes designed for individuals with type 2 diabetes were characterised by: regular independent patient consultations by practice nurse using clinical information system tool, guideline-based care, physician feedback, patient information leaflets and self-management support. The identified pillars are multidisciplinary and patient engagement/empowerment (22).

Patient-centred medical home model

The patient-centred medical home model is one of the chronic care models that has reportedly shown to provide a multidimensional solution to effectively managing chronic illness and multimorbidity in primary care. This enhanced primary care model typically consists of a general practitioner-led care, as part of a multidisciplinary team that aims to provide patient-centred care that is also comprehensive and coordinated, with emphasis on self-management and patient education. The most commonly reported elements of this model are: integrated primary health care; use of efficient referral pathways between sites of care; use of technology in the development and implementation of care plans and shared decision-making; patient-provider partnership towards shared goals; patients' education and participation in the development and self-management of their chronic disease. The identified pillars are: multidisciplinary; coordination of care; process management; patient-centredness and patient engagement/empowerment (31).

System navigation model

The system navigators model employs healthcare workers to facilitate safe and effective transitions across healthcare settings. Generally, target population include those whose medical conditions are persistent and disabling and whose circumstances require additional support in accessing appropriate care. Navigation roles often focus on a specific setting, disease, population or role. System navigation models are rel-

evant to chronic disease management for older adults to reduce barriers to care and support patients' access to appropriate care as they transit across different providers or settings. In detail, the navigation models' services include: care planning, coordination of care, liaison with medical and community services, phone support, home visits, and patient and caregiver education. The main pillars are: coordination of care, case management, patient engagement/empowerment (25).

Telerehabilitation

The integrated telerehabilitation approach consists in rehabilitative care beyond the hospital setting in which there is technology that allows for the double communication loop between the hospital and the patient. The interventions delivered can be: synchronous (in which patient and therapist perform exercises in real time), asynchronous (in which patient and therapist do not interact in real time) or mixed. This care model can meet the patients' need to reconcile long-lasting programs with a social and productive life. The integrated telerehabilitation approach for rehabilitative care in multiple sclerosis allowed for the double communication loop between the hospital and the patient enabling the remote monitoring of the patients' performance and the response with appropriate feedback to the patient. The main pillars are: patient-centredness, patient engagement/empowerment and digital health (18).

Nurse-led discharge program

Nurse-led early discharge programmes are led by a nurse, supported by a multidisciplinary team. They permit timely focus on a functional needs assessment for discharge and beyond, on information provision for patients and their carers, and on the rationalisation of discharge medications. The key elements are: nurse visit within 48 hours of hospital admission, pre-discharge assessment, structured home visits and telephone follow-up after discharge. The identified pillars are: case management and multidisciplinary (32).

The main characteristics of the experiences reported by the selected studies are summarised in **Table 1**.

Pillars of the continuum of care models

Analysing the selected studies, the presence of elements common to multiple models can be noticed and highlighted. In fact, the high frequency of specific pillars emerged: "patient engagement and empowerment" in 19 studies (11-18, 20-29,31) (86%); "multidisciplinary" in 16 studies (11-12,14,16,19,21-24,26-32) (73%); "coordination of care" in 11 studies (15-16,20,23-29,31) (50%); "case management" in 11 studies (11-12,14,16,21,23-26,29,32) (50%). Less frequent pillars were: "integration

N°	Author(s)	Title	Year	Country	Description of the model/experience	Main pillars
INTEGRATION OF CARE						
1	Nicholson C, Jackson C, Marley J	A governance model for integrated primary/secondary care for the health-reforming first world – results of a systematic review	2013	Australia	Integrated primary/secondary healthcare model based on the following elements: joint planning, promotion of local integrated information communication technology (shared electronic health records), change management strategies, shared clinical priority areas between organisations, aligned incentives, population focused care, measurement (using data as quality improvement tool), continuing professional development supporting the value of joint working, patient/community engagement, innovation.	Multidisciplinarity Coordination of care Patient engagement/empowerment
2	Scholl I, Zill JM, Härter M, Dirmaier J	An Integrative Model of Patient-Centeredness – A Systematic Review and Concept Analysis	2014	Germany	Integrative model of patient-centredness made of: -Principles: essential characteristics of the clinician, clinician-patient relationship, patient as a unique person, biopsychosocial perspective; -Enablers: clinician-patient communication, integration of medical and non-medical care, teamwork and teambuilding, access to care, coordination and continuity of care; -Activities: patient information, patient involvement in care, involvement of family and friends, patient empowerment, physical support, emotional support.	Clinician-patient relationship Patient-centredness Patient engagement/empowerment Coordination of care Integration of health and social care
3	Pearson M, Hunt H, Cooper C, Shepperd S, Pawson R, Anderson R	Providing effective and preferred care closer to home: a realist review of intermediate care	2015	UK	Intermediate care services intended to prevent admission to hospital and/or provide rehabilitation in, or nearer to, people's homes. The key elements were: -Collaborative decision-making with service users to facilitate re-enablement (agreement of the objectives of care, promotion of the continuity of care in the health and social care system, highlight the role of carers in discussing and agreeing care, definition of the 'best' environment for the 're-enablement'); -Integrated working between health and social care professionals and carers (change management within and between health and social care organisations, engagement with staff, professional development, leadership, supporting organisational structures and processes, active engagement of carers and voluntary services as part of the team)	Patient engagement/empowerment Coordination of care Integration of health and social care
4	Mitchell GK, Burridge L, Zhang J et al.	Systematic review of integrated models of health care delivered at the primary-secondary interface: how effective is it and what determines effectiveness?	2015	Australia	Integrated models of health care between primary and secondary-tertiary care. Common elements were: interdisciplinary teamwork; communication/information exchange; shared care guidelines or pathways; training and education; access and acceptability for patients; viable funding model.	Multidisciplinarity Process management
5	Damery S, Flanagan S, Combes G	Does integrated care reduce hospital activity for patients with chronic diseases? An umbrella review of systematic reviews.	2016	UK	Integrated care model for patients with chronic diseases. The interventions were classified in: -Case management: Implementation of a collaborative process between one or more care coordinators or case managers and the patient, to assess, plan and facilitate service delivery; -Chronic care model: organisational support; clinical information systems; delivery system design; decision support; self-management support; community resources; -Discharge management: designed to facilitate effective transitions from hospital care to other settings; -Multidisciplinary teams: Interventions comprising teams composed of multiple health and/or social care professionals; -Self-management: Interventions designed to provide patient support, dietary and lifestyle advice and/or condition-specific education supporting medication adherence.	Case management Patient engagement/empowerment Multidisciplinarity Coordination of care Integration of health and social care
6	Flanagan S, Damery S, Combes G	The effectiveness of integrated care interventions in improving patient quality of life (QoL) for patients with chronic conditions. An overview of the systematic review evidence	2017	UK	Integrated care interventions for patients with chronic conditions. Intervention categories included: case management, discharge management, Chronic Care Model, multidisciplinary teamwork, complex interventions, primary vs. secondary care follow-up, and self-management.	Case management Multidisciplinarity Patient engagement/empowerment

7	Smith SM, Cousins G, Clyne B, Allwright S, O'Dowd T	Shared care across the interface between primary and specialty care in management of long term conditions	2017	Ireland	Shared health service interventions for the management of chronic disease across the primary/specialty care interface. Structured interventions that involved continuing collaborative clinical care provided by primary and specialist care physicians were the following: - Liaison meetings between specialists and primary care team members for discussion and planning of ongoing management of pre-specified chronic disease; - Shared care record cards (usually patient-held); - Computer-assisted shared care and electronic mail. This system could include centrally co-ordinated computerised registration and recall of patients.	Multidisciplinarity
8	Baxter S, Johnson M, Chambers D, Sutton A, Goyder E, Booth A	The effects of integrated care: a systematic review of UK and international evidence	2018	UK	Multi-elements and complex models of integrated care including the following main elements: patient education; integrated pathways/plans; shared access to records/information technology; case management; multidisciplinary teams; multidisciplinary meetings; acute service moved to community.	Patient engagement/empowerment Process management Case management Multidisciplinarity
9	Hendry A, Vanhecke E, Carriazo AM et al.	Integrated care models for managing and preventing frailty: A systematic review for the European Joint Action on Frailty Prevention (ADVANTAGE JA)	2019	UK, France, Spain, Ireland, Finland, Malta, Italy, Romania, Greece, Belgium	Integrated care model for frailty. Key components were: -Use of simple frailty specific screening tools in all care settings; -Tailored interventions by interdisciplinary teams in hospitals and community; -Effective management of transitions between care teams and settings; -Information and technology enabled care solutions; -Clarity about service eligibility care policies, procedures and processes. -Restorative home care (home support designed to enable the recovery of independence); -Chronic case management in primary care and coordination of support across the continuum of providers; -Comprehensive geriatric assessment in hospital; -Intermediate care services that offer safe and effective community based assessment, treatment and rehabilitation.	Multidisciplinarity Patient engagement/empowerment Coordination of care Case management
TRANSITIONAL CARE						
10	Olson DM, Prvu Bettger J, Alexander KP et al.	Transition of Care for Acute Stroke and Myocardial Infarction Patients: From Hospitalization to Rehabilitation, Recovery, and Secondary Prevention	2011	USA	Coordinated transition of care services for the post-acute care of patients hospitalized with first or recurrent stroke or myocardial infarction. The models included: discharge planning process including procurement of equipment and services, integrated-care pathways referrals for follow-up care, rehabilitation coordination with community services; systems for shared access to patient information to allow multiple health care providers across settings to access patient information and to coordinate care; education of the patient and family prior discharge; community-based support provided through advanced practice nurse care managers, primary care and specialty-based medical practitioners, and multidisciplinary care teams.	Coordination of care Process management Patient engagement/empowerment Case management Multidisciplinarity
11	Allen J, Hutchinson AM, Brown R, Livingston PM	Quality care outcomes following transitional care interventions for older people from hospital to home: a systematic review	2014	Australia	Transitional care interventions for older people to promote safe and timely transfer from hospital to home. Essential elements were: discharge assessment and care planning; communication between providers; preparation of the patient and carer for the care transition; reconciliation of medications, community-based follow-up, and patient education about self-management. The main practitioner/s responsible for implementing the transitional care intervention were variable: advanced practice nurses, general practitioners and primary care nurses, older person and their carer with the support of a transition coach, case managers, geriatricians.	Coordination of care Patient engagement/empowerment Case management Multidisciplinarity

12	Albert NM	A systematic review of transitional-care strategies to reduce rehospitalization in patients with heart failure	2016	USA	Transition-of-care models to minimise exacerbation and rehospitalisation, and improve quality of life for patients with heart failure. The main themes were:- Discharge planning - Multi-professional teamwork, communication, and coordination during transition from hospital to home: health care provider communication with multidisciplinary team members (handoff), patients, and family members (or other informal supporters or caregivers). - Timely, clear and organized information - Medication reconciliation and adherence - Engaging social and community support groups: utilize support from social and community services - Monitoring and managing signs and symptoms after discharge, delivering patient education, self-care maintenance and management - Outpatient follow-up - Advanced-care planning and palliative/end-of-life care.	Multidisciplinarity Patient engagement/empowerment Coordination of care Integration of health and social care Communication
13	Le Berre M, Maimon G, Sourial N, Guériton M, Vedel I	Impact of transitional care services for chronically ill older patients: A Systematic Evidence Review	2017	Canada	Transitional care interventions for older patients with chronic diseases transitioning from hospital to home. The interventions were mainly based on: pre-arranged structured post-discharge follow-up (e.g., home visits, phone calls, provided phone availabilities or a hotline service); medication management; coordination of care; patient education; multidisciplinary coordination process; multidisciplinary teamwork.	Case management Coordination of care Patient engagement/empowerment Multidisciplinarity
DISEASE MANAGEMENT						
14	Kruis AL, Smidt N, Assendel WJJ et al.	Integrated disease management interventions for patients with chronic obstructive pulmonary disease	2013	Netherlands	Integrated disease management programs in people with chronic obstructive pulmonary disease. The interventions were based on: self-management (education, goals and/or action plan, exacerbation management); exercise (home training and/or strength and/or endurance training); psychosocial interventions (cognitive behavioural therapy, stress management, other psychological assessment and/or treatment); structural follow-up and/or communication; case management by nurses; multidisciplinary team work (active participation of teams of professional caregivers from different disciplines, revision of professional roles, integration of services, local team meetings).	Patient engagement/empowerment Case management Multidisciplinarity
15	Takeda A, Martin N, Taylor RS, Taylor SJC	Disease management interventions for heart failure	2019	UK	Heart failure disease management interventions including: post-discharge intense monitoring of patients (usually done by a nurse and typically involving home visits or telephone calls, or both); outpatient clinics for heart failure (usually run by cardiologists or by specialist nurses using agreed protocols to manage medication); holistic approach to the individuals' medical, psychosocial, behavioural and financial circumstances by several different professions working in collaboration.	Case Management Multidisciplinarity Patient engagement/empowerment
SELF-MANAGEMENT						
16	Jordan RE, Majothi S, Heneghan NR	Supported self-management for patients with moderate to severe chronic obstructive pulmonary disease (COPD): an evidence synthesis and economic analysis	2015	UK	Self-management support interventions for patients with chronic obstructive pulmonary disease through a collaboration between the health-care professional and the patient based on patient education, monitoring and assessment of progress, feedback and reinforcement.	Patient engagement/empowerment
17	Band R, Bradbury K, Morton K et al.	Intervention planning for a digital intervention for self-management of hypertension: a theory-, evidence- and person-based approach	2017	UK	HOME BLOOD PRESSURE (BP) logic model consisting of HOME BP online (for patients and healthcare professionals), BP self-monitoring, medication titration procedures and optional behavioural support. The interventions were developed using a theory-based, evidence-based and person-based approach: -Behavioural techniques to build patient motivation; -Self-monitoring; -Medication intensification, titration and adherence; -Lifestyle modification changes; -Automated email reminders	Patient engagement/empowerment Digital health

CHRONIC CARE						
18	Bongaerts BWC, Müssig K, Wens J et al.	Effectiveness of chronic care models for the management of type 2 diabetes mellitus in Europe: a systematic review and meta-analysis	2017	Germany/Belgium	Multifaceted Chronic Care programmes designed specifically for individuals with type 2 diabetes, characterised by: -Provided multidisciplinary care; -Addressed patient empowerment; -Provided quality management (e.g., patient registry systems, recording of process measurements and adherence to guidelines, achievement of treatment goals); -Delivered in primary or secondary care; -Minimum duration of 6 months. -Regular independent patient consultations by practice nurse using clinical information system tool, guideline-based care, physician feedback, patient information leaflets, self-management support for patient and patient treatment groups.	Multidisciplinary Patient engagement/empowerment
PATIENT-CENTRED MEDICAL HOME						
19	John JR, Jani H, Peters K, Agho K, Tannous WK	The Effectiveness of Patient-Centred Medical Home-Based Models of Care versus Standard Primary Care in Chronic Disease Management: A Systematic Review and Meta-Analysis of Randomised and Non-Randomised Controlled Trials	2020	Australia	Patient-centred medical home models. The most commonly reported principles were: -Integrated primary health care: GP led integrated care or MDT approaches consisting of at least one other health care professional; -Coordination of care within levels of the health care system using efficient referral pathways between sites of care; -Data driven quality of care: use of technology in the development and implementation of care plans, shared decision-making, and for quality improvement auditing; -Long-term patient-provider relationship: promotion of continuity of care through an ongoing partnership between patient, GP, and the MDT health care professionals towards the shared goal of providing high-quality patient-centred care; -Patient empowerment and patient engagement: education to empower patients to actively participate in the development and self-management of their chronic disease.	Multidisciplinary Coordination of care Process management Patient-centredness Patient engagement/empowerment
SYSTEM NAVIGATION						
20	Manderson B, Memurray J, Piraino, Stolee P	Navigation roles support chronically ill older adults through healthcare transitions: a systematic review of the literature	2012	Canada	System navigation models relevant to chronic disease management for older adults to reduce barriers to care and supporting patients' access to appropriate care as they transit across different providers or settings. Navigation models offered a variety of services including: care planning, coordination of care, liaison with medical and community services, phone support, home visits, and patient and caregiver education.	Coordination of care Case Management Patient engagement/empowerment
TELEREHABILITATION						
21	Di Tella S, Pagliari C, Blasi V, Mendozzi L, Rovaris M, Baglio F	Integrated telerehabilitation approach in multiple sclerosis: A systematic review and meta-analysis	2020	Italy	Integrated telerehabilitation approach for rehabilitative care in multiple sclerosis beyond the hospital setting. Technology allowed for the double communication loop between the hospital and the patient enabling the remote monitoring of the patients' performance and the response with appropriate feedback to the patient.	Patient-centredness Patient engagement/empowerment Digital health
NURSE-LED DISCHARGE PROGRAM						
22	Zhu Q-M, Liu J, Hu H-Y, Wang S	Effectiveness of nurse-led early discharge planning programmes for hospital inpatients with chronic disease or rehabilitation needs: a systematic review and meta-analysis	2015	China	Nurse-led early discharge planning programmes consisting of: pre-discharge assessment, structured home visits and telephone follow-up after discharge led by a nurse and supported by a multidisciplinary team.	Case management Multidisciplinary

Table 1 - The main characteristics of the experiences

of health and social care” in 4 studies (15-16,20,27) (18%); “process management” in 4 studies (12,26,30-31) (18%); “patient centredness” in 3 studies (18,20,31) (14%). In just 2 of the studies analysed the “digital health” pillar emerged (17,18) (9%) and in 2 studies also pillars like: “clinician-patient relationship” (20) (4.5%) and “communication” (27) (4.5%) emerged (Figure 1).

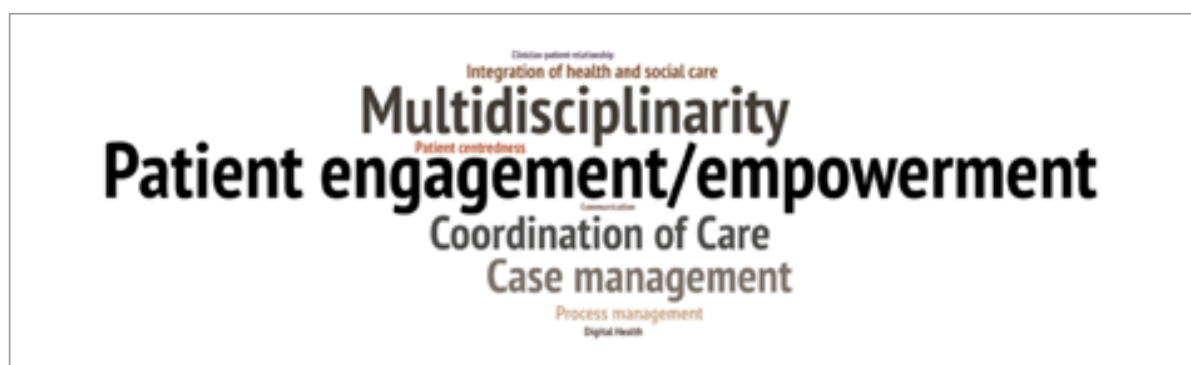


Figure 1- Pillars of the analysed continuity of care models

Conclusions

This study aimed to review international models and approaches supporting the continuum of care and analyse their main focuses, with particular reference to chronicity, comorbidity, disability or frailty areas. Nine models from 22 reviews were analysed among which the most represented were integration of care (11-12,15,16,19,20,23,28,30) and transitional care models (24,26,27,29), followed by disease management (14,21), self-management (13,17), chronic care model (22), patient-centred medical home (31), system navigation (25), telerehabilitation (18) and nurse-led discharge models (32). The models analysed are based on ten pillars as a whole, with patient engagement and empowerment (11-18,20-29,31), multidisciplinary (11-12,14,16,19,21-24,26-32), coordination of care (15-16,20,23-29,31) and case management (11-12,14,16,21,23-26,29,32) being the most frequent pillars, followed by integration of health and social care (15-16,20,27), process management (12,26,30,31), patient-centredness (18,20,31), digital health (17-18), clinician-patient relationship (20) and communication (27).

As for the continuum of care models, **integration of care** represents an organising principle for care delivery that aims to improve patient experience of services through improved coordination across and between settings (33). This model has been proposed as a solution to fragmentation (34) resulting from the many touch points that older patients with multiple morbidities have with the health system during an episode of care (35). Such a fragmentation is associated with incomplete transfer of information between healthcare providers (36) and greater challenges in managing and

coordinating care delivery to ensure optimal outcomes (37). Hendry A et al (2018) (38), consistently with our findings (11-12,16,19,30), highlight that many chronic care programmes deliver integrated care through the building of continuous relationships with a primary care or social care professional, supported by coordinated care from an interdisciplinary team.

Transitional care can be considered a part of integrated care which occurs over longer duration of care episodes (39) and a part of prevention of re-hospitalisation programs within longer-term chronic disease management initiatives (40). Our findings (24,26,27,29) run in parallel with the transitional care model core components reported by Hirschman K et al (2015) (41): engaging patients and family caregivers; assessing and managing risks and symptoms; educating and promoting self-management; promoting continuity; and fostering coordination and collaboration. Our study also underlined the importance of structured post-discharge follow-up (24,26,27,29), medication adherence/reconciliation (24,27,29) and discharge assessment and planning (26,27,29).

Disease management programmes in healthcare have been introduced to implement evidence-based clinical practice (through guidelines, care protocols, and formulary lists of effective drugs), improve coordination among providers and assure comprehensiveness of care (42). In line with our findings (14,21), some authors reported that disease management emphasises coordinated, comprehensive care along the continuum of disease and across health care delivery systems and that its process is made of a combination of patient education, provider use of practice guidelines and appropriate consultation (43-44). The importance of structured follow-up (21) and psychosocial support (14) also emerged from our review.

Our results (17) are aligned with those from Dineen-Griffin et al. (2019) (45) with regard to the pivotal objective of **self-management** that is to change behaviour within a collaborative arrangement to produce sustainable effects. This can be achieved by increasing patients' skills and confidence in managing their disease state through regular assessment of progress and problems, goal setting, and problem-solving support (45). Moreover, further studies from the literature also point out the importance of patients network and support, stating that the relationships among the patients and their health care providers (primarily nurses), friends, community, and family members are fundamental to the self-management success (46-47).

Besides self-management, evidence increasingly highlights the importance of reorienting health policies and healthcare towards chronic care systems in which primary health care practices change their care delivery from acute and reactive to chronic and proactive (48) that is organised, structured, and planned, through a combination of effective multidisciplinary teams and planned interactions with chronically ill

patients (49). The **chronic care model**, in fact, is designed to help practices improve patient health outcomes by changing the routine delivery of ambulatory care to make patient-centred, evidence-based care easier to accomplish (50). As also reported in our findings (22), according to Coleman K et al (2009), key elements are: effective team care and planned interactions; self-management support bolstered by more effective use of community resources; integrated decision support; patient registries and other supportive information technology (50).

The **patient-centred medical home** model is defined by Nutting PA et al (2011) as a means of improving primary care through provision of team-based, patient-centred care for a registered patient cohort, thereby enhancing patient experience, and improving quality of care (51). Two studies (52-53), in line with our review (31), reported as common principles: patient engagement through education and self-management, and care coordination in addition to team-based care. Our findings (31) are consistent also with the study by Fontaine P et al (2014), where the model is described by key attributes and functions that include patient-centredness, comprehensive and coordinated care, accessible services, and a commitment to quality and safety (54).

In our review we got to deepen **system navigation** as an approach relevant to the reduction of barriers to care, bridging gaps in service which serve as pitfalls for complex patients (25). According to Carter N et al (2018), the development of navigation roles and models speaks to unmet needs for coordination and facilitation of care and service, particularly in relation to populations for whom social determinants of health create additional barriers to accessing social and health care services and supports (55). Navigation roles often focus on a specific setting, disease, population or role (25). Examples from literature of setting-based roles include the community case manager - as reported by Luzinski CH et al (2008) - whose goal is to facilitate services across the care continuum (56). Further studies on this topic better specify that navigators assist with fragmentation of the health and social care system through various methods including: communication with multiple agencies (57-58), facilitating access to care (59-60) and navigating the system and services (61).

Finally, the telerehabilitation and nurse-led discharge models have also been reported and described.

Telerehabilitation has been developed to take care of patients, transferring them home after the acute phase of a disease to reduce hospitalisation times and costs (62). In line with our review (18), a study by Carey JR et al (2007) (63) reports that this care model allows for treatment of the post-acute phase of diseases by substituting the traditional face-to-face approach in the patient-rehabilitator interaction. In the literature, there is considerable support for the value of interventions delivered in the

natural environment, ranging from addressing efficacy concerns, to increasing patient participation, including environmental context in rehabilitation, and increasing patient satisfaction (64).

Regarding **nurse-led discharge**, also known as nurse facilitated discharge, Lees L (2004) defines this approach as the delegation of responsibility for the patient's discharge process according to an agreed plan following specific criteria/tools (65). Our findings (32) are in line with another study from the literature where it emerges that nurse-led discharge involves the nurse facilitating and accelerating the discharge process by coordinating him/herself with all the other professionals participating in the patient care (66).

Concerning the pillars the continuum of care models are based on, the most listed (in 86% to 50% of the studies) identified in the included studies are: patient engagement/empowerment (11-18,20-29,31); multidisciplinary (11-12,14,16,19,21-24,26-32); coordination of care (15-16,20,23-29,31) and case management (11-12,14,16,21,23-26,29,32). The explanation of the high recurrence of these elements may lie mainly in the transversal characteristics of the models that inevitably determine the overlapping of the founding pillars. Our findings suggest, in fact, that the different continuum of care models analysed shouldn't be considered as stand-alone. Indeed, their key elements look strongly interrelated, probably due to the same need of the models of responding to the complex nature of chronicity and multimorbidity. The concept of **patient engagement** is receiving a growing attention in the healthcare field (67-68). The last decades have seen a deep revision of care models in the aim of a greater acknowledgement of the patient role, seen as an expert actor, in the healthcare process (69). A shift towards a culture of patient engagement at all levels of the healthcare system has been recognised as a key priority in the chronic care management and could be the base for the implementation of new actions able to strengthen the role of patients and their caregivers along the whole care journey (70). The importance of **multidisciplinary** is underlined by Rothman AA and Wagner EH (2003) (71), that emphasise the need to reach a high quality chronic disease management through an integrated and coordinated approach by a multidisciplinary care team with regard to assessment, treatment, support for self-management and follow-up. Cross-disciplinary collaboration of healthcare professionals is needed to guarantee that patients undergo periodic assessment of clinical status, in addition to ensuring that relevant resources and assistance are provided in a timely manner (72). The reason for the high frequency of the "**coordination of care**" pillar in the included studies (15-16,20,23-29,31) can be found in the fact that in the chronicity settings patients often have multiple conditions that require a well-coordinated system of care across multiple providers in different settings (73). Care coordination is particularly

critical when numerous healthcare professionals are involved in patient care (74) as it happens in multimorbidity and frailty contexts.

The connection between chronic conditions, multimorbidity and **case management** is not something new. Over the past years, case management programs have emerged as an approach to the management of chronic disease focused on improving individuals' health and serving social needs (75). The case managers have shown the abilities and the skills to assess a mix of clinical and social problems, and then accessing the correct networks to help elderly people with multiple illnesses navigate a complex system of providers (76).

The presence of other pillars that emerged in our study even if with less frequency (in 18% to 14% of the studies) - integration of health and social care (15-16,20,27), process management (12,26,30-31) and patient centredness (18,20,31) - is also to be discussed. As people are living longer with higher incidence of long-term health conditions and multiple diseases, there is a move towards greater integration of care, including **integration of health and social care** services that seeks to support people with multiple long-term health conditions (77). Integrated health and social care services take many different forms to improve population health, with varying levels of coordination across geographical boundaries (78). A lack of understanding of organisational cultures, repeated complex structural changes and ineffective communication are common barriers to the integration of health and social care (79). This may justify the lower recurrence of this pillar in the studies included in our review (15-16,20,27). **Process management** represents a fundamental shift from a traditional (function-driven) approach to an end-to-end process (patient-driven) approach (80). The process management methodology consists with many medical processes for disease and care procedures (81) and it is used in clinical pathways as a multidisciplinary tool to manage the care quality (82). Moreover, interventions to improve **patient-centredness** for people with multimorbidity and their effectiveness in primary healthcare are well documented (83) although there is considerable ambiguity concerning the exact meaning of the term and the optimum method of measuring the process and outcomes of patient-centred care (84).

The less frequent (in 9% to 4,5% of the studies) pillars identified in our review are: digital health (17-18), clinician-patient relationship (20) and communication (27). Considered the importance of such elements in the management of complex and/or chronic conditions, these findings could represent suggested topics for further investigations, especially in regards to the future prospects of digital health in our technological era. Continuity of care is a concept that concerns an integrated system of care that directs and follows the whole patients' journey over time through a full range of health services covering all levels of intensity of care (6). Our research, fo-

cused on different continuum of care models, their key elements and pillars, met the aim of having the widest possible overview on the topic, beyond the identification of the “perfect” continuum of care model. Different healthcare models exist because patients, with their diseases and within their contexts, are different in their traits, characteristics and needs. It is therefore important for healthcare providers and organisations to understand when a particular model must be implemented, based on their own internal and external contexts’ characteristics and their patients’ health needs. Even if the continuum of care models’ key elements and pillars have been separately analysed and summarised, it is important to highlight that they are all interconnected and have to be considered as a part of a holistic care process that aims to respond to the different and complex patient’s health needs. Research to date suggests, in fact, that chronic illness care improvement requires the delivery system to adopt a primary health care orientation emphasising the comprehensiveness of the care process and the overall health of the patient (85) and implementing multicomponent and multi-level interventions based approaches (86-87).

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