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THE SELF-CARE MATRIX: A UNIFYING FRAMEWORK FOR SELF-CARE

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ABSTRACT

BACKGROUND: There is resurgent interest in the concept and practice of self-care as a means to improve the health, wellness and wellbeing of individuals, and as an avenue to mitigate financial pressures and growing demands on health and social care systems worldwide. An ongoing challenge has been the lack of clarity on the specific nature and entire scope of self-care, coupled to a lack of a universal or widely accepted framework that could support the conceptualisation and study of self-care in its totality, in all settings and from different perspectives.

OBJECTIVES: To advance a comprehensive yet pragmatic and widely accessible framework to support the conceptualisation of self-care in its totality, in order to facilitate the development, commissioning, evaluation and study of self-care initiatives across a variety of settings.

METHOD AND FRAMEWORK DEVELOPMENT: A pragmatic review of the academic and lay literature was undertaken to identify extant theories and conceptual models of self-care. Following a content analysis, the models were characterised, and a configuration matrix was constructed to illustrate the key components and main themes of each model. These themes were organised into a number of domains which were grouped together into cardinal dimensions of self-care. The dimensions of self-care were consolidated in an inclusive framework and visually depicted on a schema to illustrate their inter-relationship.

RESULTS: We identified a total of 32 candidate models, theories and frameworks of self-care. Characterising these models led to the identification of various themes and domains. These were found to naturally group into four cardinal dimensions of self-care: (1) Activities, (2) Behaviours, (3) Context, and (4) Environment. A new model was synthesised to illustrate the relationship between each dimension on a configuration matrix resulting in the creation of the Self-Care Matrix (SCM).

CONCLUSION: The Self-Care Matrix (SCM) is a useful framework that can be used to conceptualise and frame the totality of self-care and its various interlinked elements. SCM is intended for use by all stakeholders who are interested in the study, development, commissioning and evaluation of self-care initiatives.

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INTRODUCTION

The global epidemic of long-term noncommunicable diseases (NCDs) and so called 'lifestyle diseases' observed today is a direct result of our inability to self-care[1,2]. Consequently, policymakers and commissioners of health services in England and elsewhere are increasingly looking at self-care initiatives as a potential means of promoting health and wellbeing in individuals and communities, whilst reducing costs and demand on scarce national healthcare resources.

There are many potential policies which support self-care activities and the sustained adoption of positive lifestyle behaviours in everyday life. However, because existing self-care interventions are usually linked to a general disease area or the management of a specific condition[3], there is scant evidence on the cost-effectiveness of self-care interventions across different settings[4-6]. An additional barrier to the widespread adoption of self-care initiatives is the lack of a suitable model to support the conceptualisation of self-care in its totality, explaining the relationship between self-care activities and behaviour change in the context of resource utilisation, and how self-care praxis can be modulated by external forces and the wider environment.

A recent study identified over 136 definitions of self-care[7], with various terms including 'self-management', 'self-efficacy', 'self-treatment' and 'collaborative care' often used interchangeably[8-10] depending on the correlating theories and the academic field of interest[7,11-16]. Consequently, various definitions of self-care have emerged as a result of differing perspectives between healthcare professionals and the general public, and between health professionals in different disciplines[7].

Various instruments have been used to assess proxy measures of self-care capacity and capability[17-19], including the Patient Activation Measure (PAM)[20-22]. However, health and social support concepts such as self-care are generally less amenable to direct measurement and evaluation due to a lack of efficient indicators[23-26] and the wide potential range of measurables. Because self-care is intimately linked to behaviour change theory which merges the fields of sociology and psychology and refers to a mutation in human health behaviour[29,30], any measurement related to self-care, either as a concept or a set of actions or behaviours, is also dependent on the specific impairment perspective[27,28]. Thus, whereas several existing frameworks and models can be used to explore the relationship between self-care and behaviour change[31-48], there is currently no univocal definition of self-care, no instrument that can measure the totality of self-care indicators directly, and no candidate model or unifying framework that can be used to explicate self-care in its totality.

Conceptualising self-care

Godfrey identified various models of self-care from the academic literature[13], but her seminal analysis excluded the study of other widely accepted but non-academic conceptual models of self-care. For example, there exist in the lay literature a number of alternative yet non-mutually exclusive mid-level descriptions and conceptual models to support the study and application of self-care in various settings. These include: (1) the widely used Seven Pillars of Self-Care Framework[49] which describes the main activities and elements of self-care relevant to the individual self-carer, and

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(2) the Self-Care Continuum[50] which describes the placement of an individual along a continuum of care in the context of resource utilisation. However, neither model from academic or lay literature was developed specifically for the purpose of conceptualising self-care in its totality, or could explain the link between self-care activities, behaviour change and resource utilisation in the context of the prevailing culture and the external environment. The lack of a conceptual and unifying framework that attempts to capture the totality of self-care may impede the development and deployment of self-care initiatives in the contemporary setting.

Aim

To characterise and consolidate existing models of self-care theory and practice gleaned from both academic and lay literature to advance a comprehensive yet pragmatic framework that facilitates the conceptualisation of self-care in its totality and its study across all settings.

METHODS

Pragmatic review of the literature

A pragmatic review of the literature was conducted to identify published theories linked to self-care and relevant models and frameworks used to conceptualise self-care across various settings. We conducted searches based on titles on all relevant databases including MEDLINE; Embase; HIMIC; Global Health; and PsychINFO through Ovid. The initial search identified 752 publications for the period 1983-2018. Additionally, we searched on CINAHL, Scopus and Cochrane databases which revealed 436, 563 and 68 publications respectively. The search in all databases used the terms: self care, self monitoring and self management to identify the relevant articles. The results of each category were combined using Boolean terms 'AND' and 'OR' to narrow down the search findings after linking with keywords like "model*", "framework*" and "scheme*". We also included relevant models and frameworks gleaned from non-academic literature including websites of various non-governmental organisations, charities and other entities engaged in the self-care discourse such as the World Health Organisation (WHO), Kaiser Permanente, the Self-Care Forum UK and the International Self-Care Foundation.

Characterising self-care models and theories

An initial review of single-disease specific models and frameworks aimed at explaining self-care theory and praxis was undertaken, which resulted in a list of 631 manuscripts. After scanning this list, a total of 44 papers were found to pertain to self-care models, frameworks, concepts or theories. This initial list included various examples of how self-care links with behaviour change theory (n=12). The latter were excluded, and the final list (n=32) was used to characterise various aspects of each self-care model.

Framework synthesis

A qualitative content analysis approach was used to identify the key assumptions, characteristics, themes and domains of self-care pertaining to each model. Further to characterising each model,

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we identified a number of themes and perspectives which could be conveniently grouped into various domains. These domains were found to naturally group together under four cardinal 'dimensions' of self-care.

The inter-relationship between each self-care dimension was considered. A visual depiction of each dimension was juxtaposed on a matrix resulting in a schema of the newly synthesised framework that could be used to conceptualise self-care theory and practice in its totality. The resulting unifying framework (the Self-Care Matrix) was assessed for congruence by determining the extent to which it supported the formal study of self-care as an applied field of research, whilst providing a logical connection between each dimension.

RESULTS

Characterising existing models and concepts of self-care

Our pragmatic review of lay and academic literature identified a range of perspectives on self-care in various contexts. We identified and characterised 32 different theories, models and frameworks that attempted to describe self-care from different perspectives. Table 1 summarises the key points of the most relevant theories and models of self-care, grouped as either prevention-focused (n=9), rehabilitation-focused (n=16) or concerned with both prevention and rehabilitation (n=7). Theories ranged from academic theories illustrating the antecedents (i.e. aspects necessary for the performance) and the consequences (i.e. results of the performance) of self-care, to more applied concepts that supported the understanding of self-care in the context of resource utilisation, or applied interventions for behaviour change in autonomous or assisted care settings.

The four cardinal dimensions of self-care

Content analysis and characterisation of each model resulted in the identification of various themes and domains of self-care which could be naturally grouped under four dimensions of self-care (table 2). The four cardinal dimensions of self-care identified were: (1) Self-Care Activities, (2) Self-Care Behaviours, (3) Self-Care Context, and (4) Self-Care Environment (table 2). Each dimension pertains to a different aspect of self-care as follows:

1st Dimension: Self-care activities (micro-level: person-centred)

The first dimension is concerned primarily with individual activities, capacities and capabilities, and what people know and do to self-care. At this micro-level, self-care is considered from a person-centred perspective. Suitable interventions may be developed to improve and promote health maintenance, monitoring and self-management of common, every-day or long-term conditions. The Health Belief Model, Orem's Self-Care Deficit Nursing Theory[51-53], and the widely used Seven Pillars of Self-Care model[54] are suitable candidate models that can be used to explore this cardinal dimension. The first dimension of self-care is necessarily concerned with the 'self', is person-centric and activities therein relate directly to what individuals can do for themselves, as well as the knowledge required to inform suitable self-care choices, such as health literacy and self-awareness.

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2nd Dimension: Self-care behaviours (meso-level: Individual and group focused)

The second dimension is concerned with the principles and actions that support and motivate individuals to engage in positive self-care behaviours and achieve the sustained adoption of health-seeking behaviours and lifestyles choices. Interventions operating at this meso-level include efforts to improve PAM scores, the use of digital health technology including nudges, gamification an incentivisation strategies to promote the sustained adoption and maintenance of desirable lifestyle choices and habits. Associated theories include the Middle Range Theory of Self-Care[55] which addresses health promoting practices within the context of the management of a chronic illness. The widely used trans-theoretical model of behaviour change and the Behaviour Change Wheel[48] are suitable candidate models that adequately describe activation and behaviour change elements relevant to self-care. The second dimension is focused on the individual, but may also extend to the social network as it describes the prevailing 'lifestyle' habits, normative attitudes and routine interactions with the immediate environment, including interface with technology and decision support tools.

3rd Dimension: Self-care context and reliance on resources (meso-level: patient-centred, health system focused)

The third dimension considers the extent to which an individual is reliant on external resources in the home, community, assisted care or professional healthcare settings. Interventions at this meso-level are often health system-focused, whereby an individual, a demography or a segment of society is routinely considered from a 'statist' or medicalised patient-perspective as opposed to a person-centred perspective. Interventions at this level are often concerned with modulating resource utilisation, including access to services, clinical pathways and/or the extent of integration of care. The widely used Self-Care Continuum[54] and the Kaiser Permanente Pyramid of Self-Care model[56] are suitable candidates for this dimension as they dynamically illustrate the inverse relationship between individual autonomy and reliance on external resources or need for increasing support.

4th Dimension: Self-care environment, barriers and drivers to self-care (macro-level: policy-driven, health system focused)

The fourth dimension is concerned with existing drivers and barriers to self-care in relationship to the operating fiscal and policy environment, and in the context of the prevailing culture and normative attitudes that inform self-care praxis in the wider community. This dimension takes into account the built and natural environment and other mediating factors. At this macro-level, drivers and barriers to self-care operate at scale or at population level. The fourth dimension is thus related to the public health landscape and informs the 'country narrative for self-care', which is largely influenced by the prevailing cultural and societal attitudes and perceptions concerned with health and wellbeing. Suitable candidate models that could be used to study this self-care dimension include Public Health Theory, Public Management Theory, Public Policy Theory and any existing Health in All Policy (HiAP) prescriptions, including directives for the built environment.

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Table 1: Characteristics of 32 generic theories, models and frameworks associated with self-care

##	year	Model / Theory / Framework	Description	Uses	Theoretical background / Rationale
			Prevention-focused		
1	1985	The Self-care Motivational Model[57]	Prescribes the use of value clarification, enhanced physical/cognitive/affective awareness, positive lifestyle choices and self-reinforcement skills training as a means to help individuals learn to become more self-motivated and active agents in promoting primary healthcare practices.	Primarily used in the development of comprehensive self-care education curricula.	Based on social learning theory, social competence theory, coping theory, achievement motivation theory, self-control theory, behaviourism and psychodynamic theory. Considers self-care in the context of disease prevention (and to a lesser degree, self-management of existing conditions).
2	1989	Conceptual Model for Explaining Self-care Behaviour for Symptoms Perceived by Respondents[58]	Illustrates how self-care and illness behaviours change depending on how people perceive their symptoms. Within this framework, self-care is viewed as care performed outside the traditional health care system.	Used to quantify or bring to awareness the proportion of experienced symptoms that could be self-managed without professional help.	The model borrows the 'health set' and 'attitude set' concepts from the Health Belief Model.
3	1990	Symptom Self-care Response Model[59]	Identifies actions to evaluate, classify and treat a symptom as integral to self-care.	Used to predict how individuals respond to a symptom by adopting a set of self-care activities.	Based on previous literature and a four-year federally funded project entitled "Illness Related Self-Care Response".
4	1990	Health-Promoting Self-Care System Model[60]	The framework is an organising perspective for explaining the cumulative and interactive relationships among factors which influence the decision-making, performance and outcomes of health-promoting lifestyles.	Used to understand how nursing is linked to attitudinal and behavioural patterns of people's health.	Based upon a synthesis of elements from the Self-Care Deficit Nursing Theory as well as certain factors in the Interaction Model of Client Health Behaviour and the Health Promotion Model.
5	1998	Self-Regulation Model for Common Sense of Self-Care[61,62]	Provides a conceptual framework to examine, describe and understand the perceptual, behavioural and cognitive processes involved in an individual's initiation and maintenance of self-management behaviours for health threats.	It predicts adherence to treatments and lifestyle change. It is also used to create media and clinician messages targeted towards the general population.	It is a multi-level, dynamic and process-oriented model that focuses on perceptual and behavioural referents of abstract concepts and their interactions. The model is built on the innate neuro-biological representation of the 'normal' body and its functions.
6	2002	The Self-care Model of Best Practice: Home Based Care[63]	An all-encompassing framework that combines the different health promotion theories developed prior to 2002.	Can be used as a tool to help health professionals in teaching communities and social networks about self-care behaviours. It was also developed to guide self-care research.	Based on Health Promotion Theory, drawing mainly from Rosenstock's Health Belief Model and Pender's Health Promotion Model. Emphasises the importance of self-care practices related to nutrition, personal hygiene, environmental sanitation, interpersonal communications, spirituality, sexuality, education, rest and recreation and protection of family members.
7	2002	Model of Self-Care for Health Promotion In Aging[64]	A multidimensional model of self-care in which the complexities of ageing are hypothesized to be moderated by partnerships between health care providers, such as nurses, and older clients.	The model is purposed as a health promotion theory to be used in clinical practice as well as further theory building and hypothesis testing.	The model is based on a thorough literature review on health promotion and well-being in the context of ageing.
8	2010	The Self-Care Concept Schema[13]	Portrays the experience of self-care as reported by individuals and families, the meaning of self-care from different perspectives along the conceptual analysis of self-care.	Provides the parameters of the self-care process within which to view the experience of self-care as it is outplayed in individuals' lives.	Assumes that the foundational aspects of self-care are the building blocks of our conceptualization of self-care.
9	2013	The Self Care Wheel[65]	A schema for helping professionals to manage stress, increase contentment and life satisfaction. (The schema was adapted from the 'Self-Care Assessment Worksheet")	It can be used as a practical tool for helping professionals to self-care more effectively.	Self-care can be learned and applied to improve overall health and wellbeing. It considers how self-care may be applied from different perspectives to satisfy physical, psychological, emotional, spiritual, personal, professional needs.

Table 1: continued

##	year	Model / Theory / Framework	Description	Uses	Theoretical background / Rationale
Rehabilitation-focused					
10	1983	Growth Model of Self-Care[66]	The model is a representation of a person's growth through life with a specific focus on the individual's quest for autonomy, through physical and psychological integrity.	It is employed as a method to enable nurses to develop nursing care plans based on the patient's ability to meet specific self-care needs.	The model evolved from analyses of knowledge and practice that describe nursing action.
11	1985	Self-Care Deficit Nursing Theory[51-53]	The theory explains that an individual requires nursing – in other words 'help' – when a self-care deficit exists as a result of self-care demand exceeding self-care agency.	Can be used as a basis to coordinate nursing care by maintaining nurse-patient relationships, designing and managing nursing care and responding to patients' needs and desires for nursing assistance.	Based on interrelated constructs of self-care and the foundation of nursing practice. It also focuses on a systems approach to healthcare.
12	1987	Model of Self-care in Chronic Illnesses[67]	The model is a modification and extension of the Health Belief Model. It focuses more on how to promote self-care as opposed to understanding health behaviour change.	The promotion of self-care and self-management behaviours among chronically ill patients.	Suggests that self-care behaviours are influenced by predisposing variables (self-concept, health motivations, patient perception of seriousness, vulnerability, efficacy), and enabling variables (patient characteristic, psychological status, regimen status, cues to action, social support, system characteristic).
13	1989	Conceptual Model for Care in Developmental Disability Services[68]	A conceptual model based on the dynamics of care which stem from the personal experience of developmental disability.	The model is employed in nursing care for the training of people with developmental disabilities.	Stems from nursing practice and the evaluation of health services provided to individuals with developmental disabilities. Assumes that the nature of care has a corollary that is self-care, that is applicable in both general terms as well as those terms specific to the field of developmental disability.
14	1996	Chronic Disease Self-Management[69]	Informs educational program that aims to increase the practice of self-management activities among patients with one or more chronic diseases and/or comorbidities.	Can be used to assists patients in gaining skills and confidence for application on a daily basis for the purpose of chronic disease self-management.	The program grew out of the Arthritis Self-Management The program is geared to incorporate education on all chronic diseases as opposed to educational programs focused on one disease only.
15	1999	Model for self-care (of home-dwelling elderly)[70]	Considers four modes of self-care depending on different conditions that entail different actions and meanings. The modes include responsible self-care, formally guided self-care, independent self-care and abandoned self-care.	The model was envisioned as a way for health professional and nursing research to understand how a patient's history and views of the future influence his/her self-care behaviour.	Based on primary research among elderly populations, literature reviews and qualitative research using a grounded-theory approach.
16	2007	Whole System Informing Self-Management Engagement (WISE)[71]	Provides an approach to understanding and providing self-care support for people with long-term conditions.	Can be used to develop self-care and self-management interventions at three different levels: the patient-level, the provider-level and the wider system-level.	Based on a whole systems approach to self-care.
17	2011	Social Networks, Work and network-based Resources for the Management of Long-term Conditions[72]	Illustrates the links between people suffering from long-term conditions to their support network including health professionals, community and voluntary groups, non-health professionals and personal communities.	Informs the development & delivery if self-care support systems by viewing communities and networks and 'expert patients' as a key means of support for managing long-term conditions.	This approach takes into consideration the form and content of social networks, notions of chronic illness work, normalisation process theory and the whole systems informing self-management engagement approach to self-care support.
18	2012	Paediatric Self-Management[73]	A comprehensive conceptual model that articulates the individual, family, community, and health care system level influences that impact self-management behaviours.	Can be used to guide development of evidence-based interventions to improve self-management, and in the design of programs aimed at preventing the development of poor self-management behaviours.	It describes the relationship among self-management, adherence, and outcomes at both the patient and system-level through cognitive, emotional and social processes.

Table 1: continued

‡‡	year	Model / Theory / Framework	Description	Uses	Theoretical background / Rationale
			Rehabilitation-focused (continued)		
19	2012	A Patient Navigation Model for Chronic Disease Self-Management (Transformation for Health)[74]	A conceptual framework developed to underpin the training of certified community health workers to deliver health care, preventive services, and health education for underserved populations to promote chronic disease self-management.	Can be used to illustrate how individuals could overcome oppressive conditions – whether these conditions are created through human design or from situational circumstances – that lead in different ways to the subjugation of the human spirit.	Assumes development in 4 phases: (1) cognitive phase develops critical consciousness, (2) Intention phase: motivational system is activated to assess capacities for transformative process,(3) Decision phase: individual actualises decisions that were made to change and maintain behaviours that promote effective self-management, and (4) Transformation phase: self/guided evaluations yield evidence of actions taken individuals to improve process management.
20	2012	A Middle Range Theory of Self-care of Chronic Illness [55]	Addresses the process of maintaining health with health promoting practices within the context of the management required of a chronic illness.	For use across a variety of chronic conditions during the process of maintaining health.	Based on three assumptions: (1) general self-care and illness-specific self-care are different, (2) decision making requires the ability to think and understand information; and (3) self-care activities for multiple comorbid conditions may conflict self-care considered for each illness separately.
21	2013	Health Literacy-informed Model of Medication Self-management[75]	The model deconstructs the tasks associated with taking prescription drugs; including the knowledge, skills and behaviours necessary for patients to correctly take medications and sustain use over time in ambulatory care.	The model can be used to review and criticize current adherence measures as well as to offer guidance to future interventions promoting medication self-management, especially among patients with low literacy skills and to demonstrate how currently available measures of adherence are inadequate.	The model provides a comprehensive examination of the range of tasks that individuals must successfully perform to manage their medication regimen.
22	2014	A Patient-focused Framework Integrating Self-Management and Informatics[76]	This framework identifies key relationships among self-management (patient behaviours), health force (patient characteristics), and patient-defined goals in the context of nursing informatics.	It is used to guide chronic illness self-management interventions through the integration of self-management and nursing informatics, to focus self-management research and promote ethical, patient-empowering technology use by practicing nurses.	The Empowerment Informatics framework can guide intervention design and evaluation and support practicing nurses' ethical use of technology as part of self-management support. It uses techno-enabled self-management interventions to prioritise patient needs.
23	2015	A revised Self- and Family Management Framework[77]	A framework that clarifies facilitators and barriers, processes, proximal outcomes, and distal outcomes of self- and family management and their relationships. It identifies key relationships among self-management (patient behaviours), health force (patient characteristics), and patient-defined goals.	It can be used in studies aimed at advancing self- and family management science and allow for the design of studies that can address more clearly how self-management interventions work and under what conditions.	As with the original framework, the model is assumed to be recursive in that processes and outcomes influence further self and family management.
24	2018	Model of Self-care and Related Concepts[14]	This model updates and integrates that proposed by Richard and Sheaf. It explains the relations among various inter-related concepts such as self-care, self-care agency, self-monitoring, self-management, self-management support, symptom management, and self-efficacy from the nursing perspective.	It can help nurses, healthcare professionals and commissioners of health to select, apply, and assess self-care capabilities and capacities in a variety of populations and conditions.	Two new concepts are added to the previous model, which are external to individual control but important for the care of people with health problems: self-management support and disease management. They clarify the different roles and responsibilities of healthcare providers and the shared responsibility
25	2018	The Taxonomy of Everyday Self-Management Strategies (TEDSS)[78]	Provides an integrated framework for understanding how patients self-manage all aspects of everyday life. Supports understanding of self-management by using original data and a recent concept analysis to propose a unifying framework for self-management strategies.	Provides a unifying taxonomy that might resolve conceptual confusion within the field of self-management science. It has potential to guide health service delivery and research and may help guide and tailor care if used as a measurement framework.	Based on the premise that self-care is a product of 5 Goal-oriented Domains (Internal, Social Interaction, Activities, Health Behaviour and Disease Controlling), and two additional support-oriented domains (Process and Resource).

Table 1: continued

‡‡	year	Model / Theory / Framework	Description	Uses	Theoretical background / Rationale
Prevention and Rehabilitation focused					
26	1956-1974/1979	Health Belief Model (HBM)[37]	A systematic method to explain and predict health-related behaviour change. Considered a health-specific social cognition model that was developed to understand the failure of tuberculosis screening programs in the US.	It is the most widely used model in the design and evaluation of health behaviour interventions.	Assumes that sustained behaviour change is determined by six variables, which are perceived barriers, perceived benefits, perceived severity, perceived susceptibility, self-efficacy and cue to action.
27	2004	The Self-Care Continuum[49,79]	The Self-Care Continuum describes the placement of an individual along a continuum of care, assuming pure self-care on one end of the scale, to pure medicalised care on the opposite end.	The aim of the continuum is to embed self-care into everyday life.	The continuum follows a 'life-cycle' approach to disease progression. It was developed by the Self-Care Forum in the UK.
28	2007	Kaiser-Permanente Pyramid[56,80]	A patient segmentation and stratification tool illustrating the population suitable to receive health promotion and prevention services along with support for self-management for chronic care patients, whereas high-risk patients receive disease and case management.	Used to provide a detailed analysis of case finding, risk stratification and population segmentation in relation to reducing emergency admissions.	This statist tool is based on the concept of clinical integration of health plan, hospital, physicians and medical group.
29	2008	Situation Specific Theory of Self-Care[81]	A conceptual model of the self-care process, defined as maintaining health through treatment adherence and symptom monitoring.	Used to maintain physiologic stability, symptom monitoring and treatment adherence through self-management.	In this model, self-care maintenance is the foundation of effective self-care involving symptom monitoring as a prerequisite for symptom recognition, evaluation, treatment implementation and treatment evaluation in the scope of self-care for long-term conditions.
30	2011	Conceptual Model of Self-Care[82]	Theoretical conceptualization of self-care and related concepts including self-management, self-efficacy, symptoms management and self-monitoring.	Enables nurses to use evidence that targets specific interventions to individualize care toward achieving the most relevant goals.	Assumes that self-care is the most encompassing concept, and that symptom recognition and self- management fall under the umbrella of self-care, but that when performed by healthcare professionals it is no longer exclusively within the dimension of self-care.
31	2011	The Seven Pillars of Self-Care[49]	A visual framework that describes the main elements of self-care relevant to the individual self-carer. It applies to people of all ages and all states of health.	Used as a practical tool to help communicate and study self-care as a multicomponent and inter-related set of activities which could be grouped into 7 pillars, but also viewed holistically.	Each of the seven pillars provides a summary description of logical sets of self-care activities and elements, which provide a pragmatic, holistic framework; (1) Knowledge & Health Literacy, (2) Mental wellbeing, Self-awareness & Agency, (3) Physical activity, (4) Healthy eating, (5) Risk avoidance, (6) Good hygiene, and (7) Rational and responsible use of products & services.
32	2014	The input/output model for self-care[83]	This model considers the needs of persons/patients in the context of socio-medical environment around the person's needs, and what intermediate and final outcomes of an initiative could result in improvement of self-care capacity.	When coupled to a management model/cycle linking the main objective, the input/output model for self-care can be used to formulate policy recommendations on self-care.	The model relies on socio-medical environment and self-care capacity.

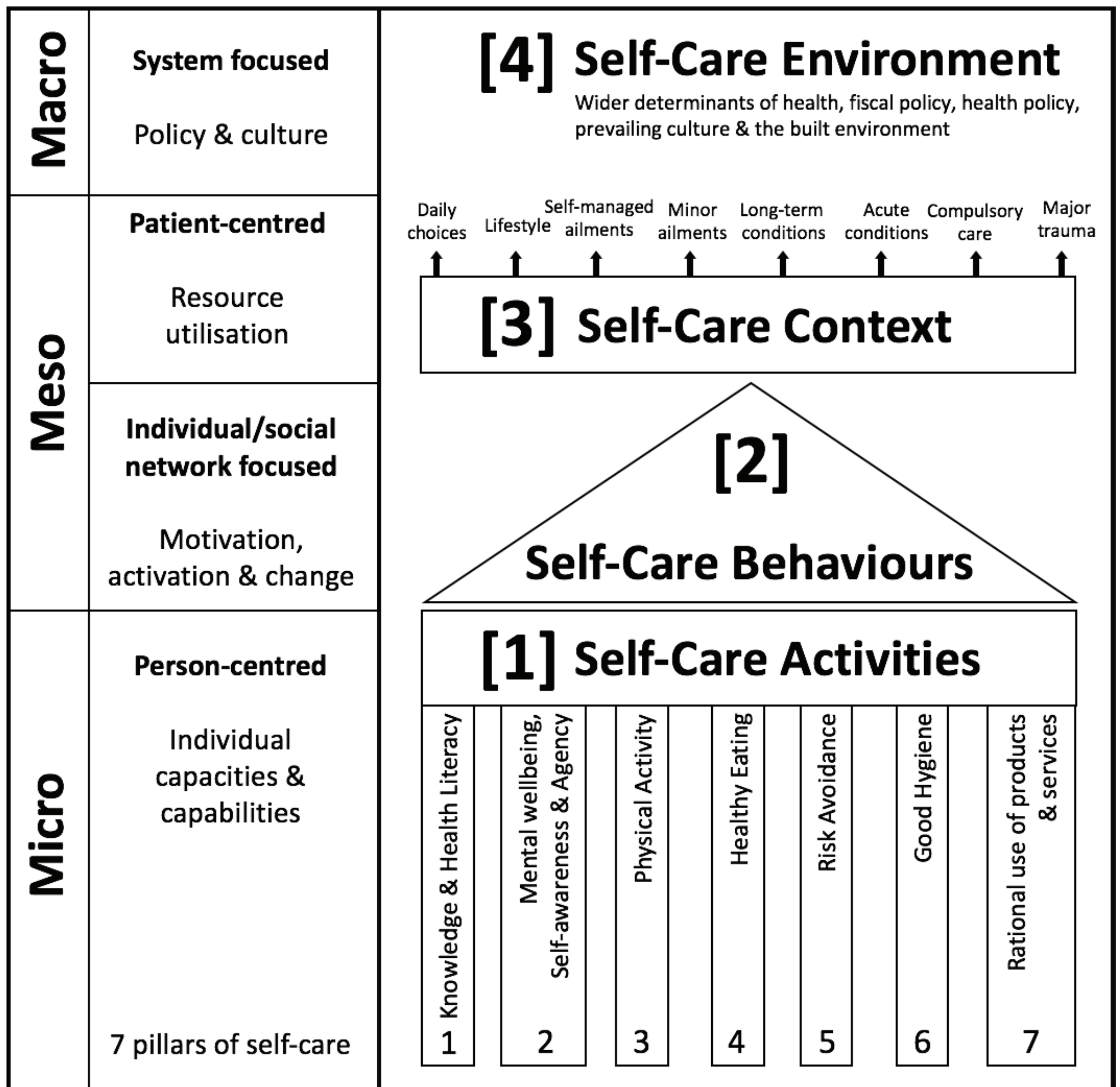
Table 2: Characteristics of the four cardinal dimensions of self-care

Self-Care dimension	Description	Perspective (Focus)	Suitable Candidate theory/model	Themes / Domains	Example Intervention areas
1- Self-Care Activities	What people know and do to self-care (daily lifestyle habits & choices)	Person-centred (micro-level)	The Seven Pillars of Self-Care Health Belief Model	1. Knowledge & Health literacy 2. Mental wellbeing, self-awareness & Agency 3. Physical activity 4. Healthy eating 5. Risk avoidance or mitigation 6. Good hygiene 7. Rational use of products and services	Health promotion initiatives Health literacy interventions Education & coaching
2- Self-Care Behaviours	The principles and actions used to sustain an outcome or behaviour	Individual /social network focused (meso-level)	Trans-theoretical Model of Behaviour Change The Behaviour Change Wheel	Activation Motivation Behaviour change	Lifestyle interventions Workplace Health Promotion Digital Health interventions
3- Self-Care Context	The extent to which an individual is reliant on external resources	Medicalised-patient (meso-level)	The Self-Care Continuum Resource Management Theory	Resource utilisation Access to services Return on Investment (ROI) potential	Integration of care Community pharmacy initiative Social prescribing
4- Self-Care Environment	Extant drivers and barriers to self-care (social, political, fiscal, cultural)	System focused (macro-level)	Organisational Theory Public Management Theory	Wider determinants of health The built environment Fiscal resources & prevailing culture	Health systems resilience The built environment Health in All Policy (HiAP) prescriptions

Model synthesis

Figure 1 shows how the four cardinal dimensions of self-care can be juxtaposed on a matrix to illustrate the relationship between them. In this new conception, the Self-Care Matrix (SCM) is a synthesis of 32 existing models and frameworks which makes it possible to consider self-care in its totality (figure 1). The two left panes of the schema congruently describe the level of focus and the perspective relevant to each dimension of self-care. The schema also shows diagrammatically how self-care activities, behaviours and activation, and reliance on resources (i.e. dimensions 1-3) are sequentially connected, whereas the self-care environment (i.e. dimension 4) exerts an omnidirectional influence on all other three dimensions of self-care.

Figure 1: The Self-Care Matrix (SCM)



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DISCUSSION

Self-care has been extensively defined and considered by various academic groups and conceptualised from many different perspectives (table 1). The lack of a unified conceptual framework that consolidates existing non-disease specific models and theories of self-care has been a significant barrier to the development of suitable self-care interventions in the contemporary setting. The strategic global development and adoption of a unified commonly-understood and widely accepted conceptual model of self-care is desirable and can benefit all stakeholders. It is also helpful to move towards understanding self-care as an applied field of research as opposed to framing the concept as a purist academic pursuit.

To this end, we advance a comprehensive yet pragmatic model that supports the conceptualisation of self-care in its totality, and that can be used by all stakeholders. The proposed Self-Care Matrix (SCM) signals a new point of departure for self-care thinking that could inform the development, commissioning and evaluation of self-care interventions.

The proposed Self-Care Matrix (SCM) thus provides a new point of departure for self-care thinking that could inform the development, commissioning and evaluation of self-care interventions in the contemporary setting by describing various aspects that could be grouped into four interlinked dimensions.

Characterising the Self-Care Matrix

Our synthesis consolidated various perspectives gleaned from 32 existing models of self-care and considered emergent themes and domains which naturally grouped into four cardinal dimensions (table 2, figure 1). The SCM schema illustrates that each dimension operates at one of three independent levels (micro, meso and macro-level). Dimensions 1 and 2 of the Self-Care Matrix consider the individual from a person-centred perspective, while dimensions 3 and 4 frame the individual or a segment of the population from the medicalised patient perspective or a broader health system viewpoint.

Self-care involves a wide range of personal activities such as physical activity, healthy eating, good hygiene and the avoidance of risks such as tobacco and excessive alcohol consumption. Although it is recognised that these activities are inter-connected, they are often approached 'vertically' in public health programmes and tend to be considered as separate activities. The Self-Care Matrix thus provides a congruent system which covers all aspects of self-care, offers a logical connection between them, and creates a framework on which metrics can be based and developed. In this regard, SCM represents real-world conditions and provides a logical unifying framework for the individual – and all other stakeholders – to make sense of all the different self-care elements and their inter-connections.

Strength and limitations

A particular strength of SCM is that it emphasises the inter-relationship between the four dimensions

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of self-care. This can help stakeholders identify the various discrete elements that could impact self-care capacities and capabilities across a wide range of settings and scenarios (e.g. during urban and environmental planning, or the development of public health initiatives or person-centred self-care interventions). By way of illustration, many urban planners use Barton & Grant's Settlement Health Map[84] as their conceptual framework. The Health Map has been widely referenced by the WHO Healthy City programmes across the world, and is inspired by three sources: (1) theories of the social determinants of health, (2) principles of human ecology, and (3) an understanding of the disciplines of planning. The Health Map has clear antecedents in Hancock's (1985) 'mandala of health'[85], which linked health to human ecosystems and discussions on the social determinants of health. Although the Settlement Health Map does not focus specifically on self-care, its concentric circles of ecosystem, environment, community and lifestyle are entirely consistent with the four dimensions of self-care expressed in the unifying Self-Care Matrix.

The principal limitation of our new conception is that the various models, theories, and frameworks of self-care used to synthesise the Self-Care Matrix did not result from a systematic review of the literature. However, our extensive pragmatic review identified the most widely used and accessible conceptions of self-care gleaned from academic and lay literature and with reference to statutory and non-governmental stakeholder groups concerned with the study and advocacy of self-care.

Integrating conceptual models with the evidence base

Because the Self-Care Matrix is a synthesis of existing theories and models, it is possible for stakeholders to use an evidence-based approach to inform the development of suitable self-care interventions for application across a wide range of settings. For example, SCM illustrates that the second dimension of behaviour, activation and change is linked to, but ultimately separate from the first dimension pertaining to self-care capacities, capabilities and activities. This delineation makes it possible to integrate the evidence base for behaviour change in a way that fosters the development of suitable self-care interventions through the application of knowledge from a broad range of behaviour change theories[31,32,36,44,48,86]. Interventions at this level may be developed that activate any number of pillars of self-care represented in the first dimension, whilst for example using incentivisation and gamification techniques to ensure traction and lead to sustained behaviour change in individuals represented in the second dimension.

Equally, the integration of the evidence base for the Self-Care Continuum[54] represented by the third dimension in SCM can be supported through a detailed analysis of case finding, risk stratification and population segmentation. This could help make the economic case for the development and funding of coherent self-care initiatives aimed at reducing reliance on resources[56], and the funding of social prescribing initiatives and workplace health promotion programmes that seek to promote the routine adoption of healthy lifestyle habits and health seeking behaviours to improve overall health and wellbeing.

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Elucidating the relationship between the wider or external environment and how this can impact self-care activities and behaviours in a segment of society can help drive fiscal and public health policy prescriptions that could refocus health systems towards a Health in All Policy (HiAP) approach[87]. For example, the WHO final report of the Commission on Social Determinants of Health concluded that 'social injustice is killing people on a grand scale'[88], and identified key commonalities between primary health care and the social determinants of health paradigms. This places a central focus on health equity, which is relevant in all countries and contexts, regardless of income level, and considers health as more than the absence of disease[89]. This evidence base can be used to develop programmes which promote multi-sectoral action and the step-wise adoption of progressive HiAP and other self-care 'best-buys' and policy prescriptions.

The Self-Care Matrix is therefore a suitable tool that could be used to model the impact that an intervention could have on the various inter-related dimensions of self-care. To exemplify, the schema shows that an intervention that causes a change in self-care activities (Dimension 1) would not necessarily precipitate a change in an individual's reliance on resources (Dimension 3) without the mediation of factors concerned with activation and the sustained adoption of a desirable lifestyle habits (Dimension 2). The schema also suggests that a change in the external environment (Dimension 4) could exert a powerful and omnidirectional influence on all other three dimensions of self-care. This analysis highlights the importance of resource mobilisation and policy development work to promote a progressive commissioning landscape which encourages the piloting of suitable evidence-based self-care interventions in the educational, applied care or community care settings.

Implications for policy makers and researchers

The emergence of long-term NCDs as a major health issue around the world has put the spotlight on self-care[90]. Through self-care, people can delay or prevent many chronic diseases such as coronary heart disease, strokes, diabetes and cancers, in which an unhealthy lifestyle is well established as a key causative agent[91]. Many countries have incorporated aspects of self-care into policies through innovative and notable practices[92]. However, all countries are a long way from implementing robust and meaningful policy prescriptions designed to promote individual and population wide self-care capabilities, whilst shifting professional practices and reorienting healthcare systems towards a preventative ethos. The development of self-care as an academic subject and as a practical choice for policymakers and health professionals presents important opportunities for the development of sustainable policy prescriptions that support a coherent 'cradle to grave' approach to national and international self-care narratives.

SCM can thus be used as a suitable lens by which to evaluate self-care interventions by considering different components of self-care across four dimensions, and provides a common framework for the study and development of policy prescriptions for self-care for application in the real-world setting. Objective evaluation of self-care initiatives using the SCM approach could help foster a culture of evidence-based commissioning for self-care interventions in the health and wellbeing space.

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Summary & Conclusion

The proposed Self-Care Matrix is a pragmatic and unifying framework that can be used to conceptualise the totality of self-care and its various interlinked dimensions. SCM can be used as a lens by which to view, identify, study and evaluate self-care elements in any health and wellbeing intervention, independent of the disease category or setting. The mid-level descriptions and the visual schema illustrating the inter-relationship between each of the four cardinal dimensions of self-care render this model widely applicable and easily accessible to a wide audience, including policymakers, commissioners of health and all other self-care stakeholders. The Self-Care Matrix signals a new point of departure for self-care thinking and can be used as a common ground between all stakeholders interested in advancing the study, practice, development, commissioning and evaluation of self-care initiatives in the contemporary setting.

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