Primary Healthcare Competencies Needed in the Management of Integrated and Person-centred Care for Chronic Illness and Multimorbidity

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Abstract

Background: Chronic disease management is important in primary care. Disease management programs focus primarily on the disease. The occurrence of multimorbidity and social problems is addressed to a limited extent. Person-centred integrated care as an alternative approach empowers patients to become active participants. In this scoping review we explore necessary competencies for healthcare professionals working in collaborative teams where the main focus lies within the concept of person-centred integrated care

Methods: Six literature databases and grey literature were searched for guidelines and peer-reviewed articles. A thematic synthesis was carried out to highlight healthcare professionals competencies that are needed to deliver person-centred integrated care.

Results: Four guidelines and 21 studies were included to identify four themes; interprofessional communication, interprofessional collaborative teamwork, leadership and patient-centred communication. Included papers lack a description of competencies core concepts, such as healthcare professionals knowledge, skills and attitudes necessary for a person-centred integrated care approach or details on how these competencies can be acquired.

Conclusion: This review provides an integrative view on competencies necessary to provide person-centred integrated care within primary care. Details on core concepts of these competencies are lacking. More research is needed, on competencies and educational programs to ensure healthcare professionals in primary care are better equipped to deliver person-centred integrated care for chronic ill patients.

Background

Chronic diseases such as cardiovascular- and pulmonary disease and diabetes mellitus type 2 are the leading causes of death and disability worldwide. According to the World Health Organization these diseases kill 41 million people each year, equivalent to 71% of all deaths globally (1). Approximately one in three adults suffer from multiple chronic diseases (2, 3). Patients with multimorbidity are at higher risk of safety issues for instance due to polypharmacy, more frequent and complex medication interactions and the involvement of different healthcare professionals resulting in competing priorities and lack of coordination of care (4). Chronic diseases and multimorbidity are also associated with considerable economic burden due to higher healthcare costs (5). Many developed countries designed disease management programs or clinical practice guidelines for prevalent chronic diseases. These programs, often implemented in primary healthcare settings, improve quality of care and patient outcomes in chronic disease (6). Studies have shown that good primary care may lead to fewer avoidable hospitalizations, but also that inadequate primary care can deteriorate illnesses leading to unnecessary hospitalizations (3).

The management of chronic diseases, in particular multimorbidity, is complex and the challenge is widely recognized. The focus of disease management programs is predominantly on the medical aspects of

individual chronic disease and much less on multimorbidity and social problems (7). A broader perspective on the management of chronic disease seems necessary, including other domains of life as well, to meet the specific needs of individuals (8). A PC-IC approach seems more appropriate to achieve this (9). PC-IC standards share a common ground: they place the patient's needs in the centre and tailored care to these needs is offered (10). The goal of PC-IC is to empower patients to become active participants in their care. This approach of giving patients more choice and control in their lives is particularly suitable in primary care where general practitioners often have a life-long relationship with patients (11).

Shifting from regular disease management towards PC-IC also means a shift in professional competencies due to the holistic approach that underlies it, which considers the different domains of the patients' life. Considering the complexity of care for patients with one or more chronic diseases their care needs often cannot be met by one single professional as different areas of expertise are necessary to optimize care for this large group of patients (7). Involved healthcare professionals should be equipped to be a part of a collaborative team where the main focus lies within the concept of person-centred care. This team consists of different professionals such as general practitioners, nurses, physical therapists, psychologists and dieticians who work side by side and rely on each other's expertise. Where necessary this primary care team collaborates with professionals from other sectors, for instance hospitals and social welfare organizations.

There is variation in the terminology used to describe this team collaboration; terms include 'multidisciplinary', 'interdisciplinary', 'interprofessional' and 'multiprofessional'. The term interprofessional applies when two or more professions learn or practice together to improve health outcomes in patients whereas multiprofessional applies when professions practice together but not necessarily on shared goals (12). The PC-IC approach is based on interprofessional collaboration, also including the patient as partner. It requires a specific skillset for team members. Being a member of such a collaborative team means working together but also setting common goals while taking the needs and preferences of the patient into account. However, it is unclear which competencies and core concepts (i.e. knowledge, skills and attitudes) these professionals should have or obtain in order to be able to deliver PC-IC.

In this scoping review our primary objectives were to provide an overview of (i) the current knowledge regarding the competencies healthcare professionals who provide PC-IC to patients with a single chronic disease or multimorbidity should have, and (ii) the core concepts underlying these competencies. Our second aim was to get insight into how these competencies can be acquired.

Methods

Study design

We performed a scoping review guided by the methodological framework proposed by Arksey and O'Malley (13); (I) identifying the research question, (II) identifying relevant studies, (III) selection of eligible

studies, (IV) charting the data, and (V) collating, summarizing and reporting the results. Quality appraisal of the methodology of empirical studies was not done as we included all types of study designs. Nonetheless, whenever possible we took the level of the available evidence into consideration to guide the narrative syntheses of our results.

I. Identifying the research question

Our primary research question for the literature review was: Which interprofessional competencies do primary care professionals need to offer person-centred integrated care for patients with one or more chronic diseases? Our secondary research question was: How can these competencies be acquired?

II. Identifying relevant studies

We developed a comprehensive search strategy with the assistance of a librarian (TP) of the HAN University of Applied Sciences. The search was conducted from onset of the respective literature databases till September 2020. First we searched for guidelines and chronic disease management programs in the Trip medical database (<https://www.tripdatabase.com>) with the following terms including their linguistic variations; a) primary care, b) integrated care, c) chronic illness, d) multimorbidity, e) shared decision making and f) competencies (Appendix 1). For this search no filters were applied. Next, using the same keywords, we searched for peer-reviewed articles in the following scientific literature databases: Cinahl, Embase, PubMed, Medline, and Web of Science (Appendix 1). Grey literature was hand-searched through websites of relevant national and international journals, scanning reference lists and through Google and Google Scholar by the main researcher (LM). We searched only for articles in English or Dutch. Search records were downloaded, combined and de-duplicated using EndNote bibliographic software (Clarivate Analytics, Philadelphia, PA, U.S.A.). Afterwards, we exported our search records to Rayyan QCRI (14) which facilitates process of blind screening.

III. Study selection

All titles, abstracts and full texts were reviewed against inclusion and exclusion criteria. The titles and abstracts of both the guidelines and peer-reviewed articles were screened blind by pairs of two out of four researchers (LM, AT, EB, ML) of which the main researcher (LM) screened all identified guidelines and peer-reviewed articles.

Inclusion criteria:

- Practice guidelines and disease management program for chronic disease(s)
- All types of empirical studies and literature reviews on integrated care of chronic care
- Primary healthcare setting involving the care for either pulmonary disease; Cardiovascular disease; Obesity; and Palliative or end-of-life care for these chronic diseases
- All papers reporting on chronic diseases or multimorbidity or comorbidity, without reporting a specific diagnosis

Exclusion criteria:

- All other settings, not being primary healthcare
- Papers that only focus on diagnostic and/or pharmacology for chronic illnesses
- Papers focused on integrated care for cancer, terminal care, and mental illnesses
- Concerning pediatric care or papers focused on chronic care for children
- Conference abstracts or posters

First the titles and abstracts were screened for relevance. Publications considered relevant only by one of the two reviewers were discussed until consensus was reached. Secondly the full text publications were retrieved and synthesized when they met the inclusion criteria.

IV. Charting the data

Two reviewers (LM, ML) jointly developed a data charting form in Excel to describe relevant information. The extracted data included the following fields:

- Organization/1st author and year of publication
- Country
- Aim/objective
- Study design and level of evidence
- Competencies

This form was used to chart data for all included guidelines and peer-reviewed papers. The main researcher (LM) filled in the data forms, which were subsequently checked by one of the other authors (ML or EB). The authors frequently met to discuss the charting of the data.

V. Collating, summarizing and reporting the results

In this final step a narrative report was produced to summarize the extracted data. We did not put emphasis on the “weight of evidence” nor on evaluating the quality of evidence. Study design was used as an analytic framework to guide the narrative account of the results.

Results

The searches identified 327 guidelines and 1,810 articles; after removing duplicates, posters and conference abstracts a total of 325 guidelines and 952 articles were screened for inclusion (figure 1). There was disagreement between two authors regarding the eligibility of a guideline/article in 4.4% of all documents. These disagreements were solved in discussion between the two authors and it was not necessary to include a third author as referee. The screening resulted in 17 guidelines and 89 articles to be obtained in full text. After reading full text papers, a total of 4 guidelines and 21 articles met the inclusion criteria and were included in the data synthesis.

Study characteristics

Table 1 reports the study characteristics. The four guidelines included were from United States (n=2), Australia (n=1) and Switzerland (n=1). Publication dates ranged between 2014 and 2021. The guidelines covered different patient populations, one was on COPD (chronic obstructive pulmonary disease) (14), one on elderly people (15), one on Palliative and End of Life care in stroke patients (16), and one on primary prevention of chronic disease in the general practice setting (17). The 21 included peer-reviewed papers used quantitative, qualitative and mixed research methods. The designs varied – ranked by level of evidence from one randomized controlled trial (15), four literature reviews (16–19), two expert opinions (20, 21), and two studies were mixed methods studies (22, 23). The remaining twelve studies were qualitative studies (24–35). The included studies were performed in the United States (n=9), the Netherlands (n=5), Australia (n=2) and one study in each of the following countries: Belgium, Canada, Ireland, New Zealand and the United Kingdom. Publication dates ranged between 2006 and 2020.

All studies related to primary care, but the specific healthcare professionals involved in the execution of PC-IC varied. Eight studies involved PC-IC from the perspective of one profession; nurses (23, 26, 27), nurse practitioners (21, 24), general practitioners (36), behavioral health consultants (18), or primary care internal medicine residents (24). Two studies involved a mix of healthcare professionals including general practitioners, nurses, occupational therapists, pharmacists, physiotherapists, social workers and speech language therapists (33, 37). In the remaining eleven studies the authors did not specify the profession (15–17, 19, 20, 22, 25, 29–31, 34, 35). The scope of the studies involved different patient populations: patients with multimorbidity (16, 21, 30, 33), frail elderly or elderly with serious illness (20, 25, 35), palliative care (19, 31), prevention of chronic illness (15, 34), or COPD (22). In nine studies the chronic illness was not specified (17, 18, 23, 24, 26, 27, 29, 32, 38). All studies involved a form of patient-centred care described as ‘a whole person approach’, ‘shared decision making’ or ‘improving self-management’ (Table 1).

Table 1
Characteristics of included guidelines and studies

Organization or 1st author and year of publication	Country	Aim/objective	Study design	Competencies
Abramowitz et al. 2010	USA	Pilot of a curriculum for a Primary Care Internal Medicine residency program that links a practical form of motivational interviewing (MI) training to the self-management support (SMS) component of the chronic care model.	Qualitative assessments with evaluation, discussion and observation	Motivational interviewing
Aerts et al. 2019	Belgium	Views of general practitioners, practice nurses and patients on interprofessional collaboration in general practice	Qualitative study using semi-structured interviews	Communication / Motivational interviewing
Al Hamayel et al. 2018	USA	Older patients' perspectives on the quality of serious illness care in primary care	Qualitative study with interviews using semi structured and open-ended questions	Patient-centered communication Clinical and interpersonal skills
Anstiss 2009	USA	Description of Motivational Interviewing and how its potential might be better realized.	General literature review	Motivational Interviewing
Byrne et al. 2019	Australia	Exploration of the nurse navigator client care.	Qualitative study with focus groups and in-depth interviews	Communication
Dale et al. 2016	United Kingdom	Incorporating behavioral health care in the integrated, collaborative and relationship-based model of primary care.	Narrative review	Communication / Motivational Interviewing

Organization or 1st author and year of publication	Country	Aim/objective	Study design	Competencies
DeJesusa et al. 2012	USA	Patients' and providers' views on what qualities they look for in a care manager	Qualitative study with a questionnaire	Personal characteristics; honesty, friendly, compassionate (empathetic, caring) and understanding (considerate, patient) Communication
Department of Defense 2014	USA	Guideline on the management of COPD, intended to assist primary care providers.	Guideline	Communication skills Collaborative team work
van Dijk-de Vries et al. 2012	The Netherlands	Views of Dutch stakeholders on achieving a biopsychosocial approach to the care of patients with chronic diseases	Qualitative explorative study with semi-structured interviews	Communication
Van Dongen et al. 2016	The Netherlands	Influential factors regarding interprofessional collaboration related to care plan development in primary care	A qualitative study, including four semi-structured focus group interviews	Discover patients' goals. Communication Interprofessional collaboration
Dudley et al. 2018	USA	Facilitators and barriers to optimal, coordinated interdisciplinary provision of community-based palliative care	Qualitative study using a constructivist grounded theory approach. Thirty semistructured interviews were conducted	Feedback / communication loops

Organization or 1st author and year of publication	Country	Aim/objective	Study design	Competencies
Fouchi et al. 2014	New Zealand	Healthcare practitioners' perspectives on chronic care	Qualitative study with focus groups and semi-structured interviews were undertaken	Teamwork, Interprofessional Communication, Cultural competence
Fowler et al. 2020	USA	Enhancing primary care and preventive services through Interprofessional Practice (IP) and education	General literature review	IP teamwork
Golden et al. 2019	USA	Connection of social, clinical, and home care services for persons with serious illness in the community	Expert opinion	Competencies in mental health, aging, and interprofessional care
Heart Association/American Stroke Association	USA	Primary palliative care competencies and skills to be considered, learned, and practiced by providers and healthcare services when caring for patients and families with stroke	Guideline	Communication
Helitzer et al. 2010	USA	To determine the efficacy and effectiveness of training to improve primary care providers' patient-centered communication skills and proficiency in discussing their patients' health risks.	RCT	Patient-centered communication
Hillebrecht et al. 2016	The Netherlands	Identify barriers and facilitators influencing self-management among COPD patients.	Mixed methods	Patient-centered communication

Organization or 1st author and year of publication	Country	Aim/objective	Study design	Competencies
Mercer et al. 2016	UK/Ireland	Primary care-based complex intervention (CARE Plus) to enhance the quality of life of patients with multimorbidity in the deprived areas.	Qualitative study with discussion groups and interviews.	Communication Focusing on the 'whole person'.
Lawn et al. 2009	Australia	Skills required by primary health care professionals to provide effective chronic condition prevention and self-management support	Qualitative study with focus groups, key informant interviews and national stakeholder meetings and a national workshop, supported by an extensive literature review.	Interviewing skills Communication Collaboration with consumers and community resources
Lein et al. 2006	USA	Effective and efficient patient-centered interviewing strategies to enhance the management of complex primary care patient encounters	Expert opinion	Patient-centered approach Patient empowerment
Lenzen et al. 2018	The Netherlands	To investigate how shared decision making approach was implemented and experienced by practice nurses and patients	Mixed methods	Coaching Communication
Van de Pol et al. 2017	The Netherlands	Competencies for shared decision making (SDM) with frail older persons, and key elements of a teaching framework, based on the authors' recently developed model for SDM	Qualitative study with a three-round Delphi study	Communication Person centeredness Time management skills

Organization or 1st author and year of publication	Country	Aim/objective	Study design	Competencies
RACGP 2018	Australia	Guideline for the implementation of prevention in the general practice setting	Guideline	Leadership Communication Management Collaboration skills with patients and external organizations
Rocker et al. 2015	Canada	Proposal of a holistic, patient-centered approach in the palliative care in advanced lung disease	Narrative review	Communication
World Health Organization 2019	Zwitserland	Guideline for integrated health and social care for the implementation of the ICOPE approach (integrated care for older people)	Guideline	Ability to conduct person-centred assessments and to develop care plans Communication, Multidisciplinary teamwork.

Identified competencies

All competencies concerning PC-IC as described in the included documents were extracted. The data synthesis identified four main themes: 1* interprofessional communication; 2* collaborative teamwork 3* Leadership and 4* patient-centred communication (Table 2).

Table 2
Competencies described in the included guidelines and articles

	Interprofessional			Patient-centred
	Communication	Collaborative teamwork	Leadership	Communication
Aerts et al.	X	X		X
Abramowitz et al.		X		X
Abu Al Hamayel et al.				X
Anstiss	X	X		X
Byrne et al.	X		X	X
Dale et al.	X	X	X	X
DeJesusa et al.	X	X		X
Department of Defence		X		X
Dijk van-de Vries et al.	X	X		X
Dongen et al.	X	X	X	X
Dudley et al.	X			X
Fouche et al.	X	X		X
Fowler et al.		X	X	X
Golden et al.		X		X
Heart Association/American Stroke Association	X			X
Helitzer et al.				X
Hillebrecht et al.		X		X
Lawn et al.	X	X		X
Lein et al.				X
Lenzen et al.	X	X		
Mercer et al.		X		X
Pol van de et al.	X	X		X
RACGP	X	X	X	
Rocker et al.	X			X

	Interprofessional		Patient-centred
World Health Organization	X	X	X

Interprofessional competencies

Communication

Two guidelines (39, 40) and 15 articles described communication to be an important competency when offering PC-IC (17–19, 21, 23, 25–32, 34, 35, 41). According to the authors communication requires open, responsive and regular communication between professionals, in team meetings as well as in bilateral conversations. Decision-making, problem-solving and goal-setting are important issues to be discussed with each other (15, 17, 25, 30, 35, 39, 42). Also, this should be an interdisciplinary team effort (26, 30, 32, 34). It is essential that the collaborating healthcare professionals are able to discover shared patient goals during team meetings (18, 26, 30–32, 39, 43). Each healthcare professional should have the ability to communicate with colleagues and other disciplines in a bidirectional manner (30, 34). This means that each party is aware of the other's professional backgrounds, strengths and boundaries and points in which professionals can reinforce each other. Team consensus is reached by dialoguing and discussing issues with all team members on an equal level. In the communication own professional perspectives and expertise are highly valued and contribute to the quality of PC-IC plans (26). Good communication skills are not only necessary within the primary care team, but it is equally important that these healthcare professionals show good communication skills towards external organizations such as other healthcare services or community agencies (32, 39, 44).

Collaborative teamwork

Three guidelines (39, 42, 45) and 15 articles (16–18, 20, 22–24, 26, 28–30, 32–35) described interprofessional teamwork or team collaboration skills. Healthcare professionals should have the ability and attitude to work collaboratively with others and share pertinent information (28, 32, 34, 37). Another critical competency is the intrinsic motivation of professionals to collaborate with others (30). This is essential as interprofessional collaboration is often considered to be time consuming, while time is scarce. Sharing knowledge of each other's involvement in patient care is another competency when sharing the same goals for their patients (21, 25, 31, 34). Interpersonal factors may also cause barriers to collaboration and therefore it is important to define a shared language and discuss the diversity of personal perspectives (30). Healthcare professionals should know who else is on the team and there should be a clear understanding of the professionals own roles as well as a clear understanding of the other professions roles and competencies (26, 29, 31, 37, 39). It could be helpful if the professionals within the collaborative team invest in getting to know each other. Research has shown that professionals knowing each other well are better able to take advantage of each other's discipline-specific competencies (30). Knowing each other also contributes to an atmosphere of mutual trust and respect

which creates an open and safe environment in which the professionals involved dare to think and act broader than their own discipline (23, 30, 39).

Leadership

One guideline (39) and five articles (16, 18, 20, 27, 30) mark good leadership as an important competency for sustainable and effective collaboration in interprofessional teams. Leadership characteristics include modeling and advocating of interprofessional teamwork, providing resources and infrastructure, and promoting shared team leadership, goals and decision making (30). Leadership skills are also required for bringing the interprofessional team together and to support professionals to adopt the shift in values and attitudes towards collaborative working (16, 18, 30, 39). Leadership skills are also necessary for attaining efficient and successful team meetings (i.e., planning, agenda setting, structuring, chairing). Although all team members should have leadership skills, within the collaborative team one team member should take the role as leader or coordinator and monitor the team's shared goals and objectives (16, 30, 39). Professionals with strong leadership competencies show to be patient advocates; they ensure that the team discusses patients' goals and needs and that patients are put in the center of care (27, 30).

Patient-centred competencies

Communication

Three guidelines (44–46) and 19 articles (15–22, 24–35) describe professionals communication with patients to be an important competency within PC-IC. Communication with patients should also be based on equality (19, 22, 25). Professionals with good communication skills respond to patients' emotions and needs and follow-up by providing tailored responses to those needs (15, 25, 46). In patient-centred communication professionals support their messages by evidence-based information tailored to the patient's needs (44). Professionals should also be skilled in relational communication techniques for communication with caregiver(s), family members or a delegated decision-maker (19, 47). Good listening skills are strongly highlighted within the PC-IC approach (17, 21, 25, 26, 28, 29, 31, 33–35, 46). Professionals should recognize nonverbal signals and strive for clarity of communication. It is important that professionals take the level of understanding due to, for instance, language barriers, physical impairments and possible cultural differences into consideration (29, 32, 35, 45, 46). Furthermore, professionals should be able to apply motivational interviewing techniques, as research has shown that this improves the quality of professional – patient interaction and shared decision making (17, 18, 24, 28).

Acquiring competencies

Three guidelines (39, 43, 46) and 17 articles (15–20, 23, 24, 26, 28–35) mentioned the need for ongoing education or training for professionals, either for communication, interprofessional collaboration or for the execution of the PC-IC approach. This requires new knowledge and skills, but a change in attitude is

also necessary. Most articles considered education to be a major facilitating factor to ensure that (future) professionals are equipped to provide care for patients with chronic illness and multimorbidity. Professional education to develop knowledge and skills should be incorporated in undergraduate programs as well as in postgraduate programs and be part of on the job training (26, 32, 33). In interprofessional education two or more professions learn with, about, and from each other to enable effective collaboration and improve health outcomes in patients (16, 39, 45, 46). Learning together with other healthcare professionals will also improve the understanding of each other's roles (20, 32). Two papers specified the training needs. Van der Pol et al. (35) and Helitzer et al. (15) reported that professionals need specific training on communication. In particular professionals need more skills in asking open ended questions. Rocker et al. (19) emphasized that during medical training, by effective mentorship and observation, medical students should obtain in depth skills on how to discover patients' needs.

Discussion

This scoping review showed that interprofessional competencies as well as patient-centred competencies are important when professionals aim to provide PC-IC in primary care. The overall findings contained limited data about specific qualifications and competencies. Nonetheless, we were able to derive some general competencies from the findings. Communication, collaborative teamwork and leadership seem to be essential competencies that healthcare professionals in primary care should either have or make sure to acquire when delivering PC-IC.

The communication competencies that would be expected from healthcare professionals apply to interprofessional communication as well as to patient-centred communication, and both should be based on equality and respect for the interlocutor(s). This is also confirmed by a recent literature review on competencies to promote collaboration between primary and secondary care physicians (48). This particular review also showed, similar to our findings, that team members should be open minded and willing to look beyond one's own position (48). Perceived hierarchy is the main conceptual barrier hindering collaboration between professionals. A new approach leads to a shift from subordination to complementarity in order to meet patients' needs (49). Patient-centred care requires physicians and other healthcare professionals to have communication skills to elicit patients' true wishes and to recognize and respond to both their needs and emotional concerns (50). Our findings show that asking open ended questions, listening, recognizing nonverbal signs and the ability to adjust to the level of understanding of the patient are the most important communication skills needed to accomplish this.

We also found that leadership skills are needed to facilitate interprofessional collaboration in more than one way. Leadership skills are needed by professionals within the primary care setting, but also in relation to collaboration with professionals from external organizations. Jansen et al. (48) described three levels on which leadership can be demonstrated; 1* in relation with other persons, 2* to facilitate collaboration, and 3* showing leadership at a system level to create an environment in which primary and secondary care collaboration is promoted and facilitated.

In the included articles the factor 'time' is important to facilitate interprofessional collaboration and the execution of PC-IC. Time is important during consultation in order to build a relationship with the patient and meet their needs (21, 30, 31, 33–35, 39). The lack of time and the large number of patients to see daily are important barriers when dealing with patients with multimorbidity. Other research also shows that seeing more than 3 or 4 patients per hour may lead to suboptimal content of consultations, lower patient satisfaction, increased patient turnover, or inappropriate prescribing (51). This points to the direction that, besides competencies, also a different way of practice organization (in particular extra consultation time) is necessary for successful execution of PC-IC (30, 31, 34, 35). Besides time for patient consultations, the current payment systems may hinder collaboration between healthcare professionals as interprofessional meetings are often not reimbursed (30).

In preparing health care professionals to take on this task, establishing standards for training in PC-IC is important. The prevalence of chronic illness is growing worldwide, and management is increasingly undertaken by interprofessional teams, yet education is still generally provided monodisciplinary (25). Educational training of both undergraduate as well as graduated healthcare professionals is needed to better prepare healthcare professionals to meet the needs of ageing patients with multiple chronic conditions in a way that is person-centred, effective and sustainable (52). Interprofessional education has an important role to play in professionals developing the competencies required to collaborate successfully (50). Future research on education should guide professionals in acquiring different qualifications and competencies.

Strengths And Limitations

To our knowledge this is the first review to provide an overview of competencies that healthcare professionals should possess to deliver PC-IC in primary care. Another strength of our review is that we used various and broad search terms, allowing inclusion of all types of literature, both scientific and grey. The aim of this study is to provide an comprehensive list of competencies. We deliberately chose to include all types of study designs and guidelines without limitations in order to capture relevant guidelines as well as scientific articles.

This study was also subject to some limitations. We excluded studies in languages other than English and Dutch. Although we might have missed some studies, most studies are likely to be published in English. While performing this review, we noted rather heterogenous terminology describing the concept of the PC-IC approach as well as for interprofessional collaboration. Therefore, to optimize our search strategy we thoroughly explored different definitions and concepts before finalizing the search strategy. We chose a sensitive search strategy rather than a specific strategy, to ensure we would not miss relevant guidelines or peer-reviewed papers of our interest. The comprehensive search included an extensive search string using Boolean operators and truncations to combine all relevant keywords and we checked the results of our search strategy against key publications. Nonetheless we may have missed relevant studies that report PC-IC related competencies due to the use of different terminology.

The fact that we did not undertake a methodology quality assessment of the included articles might be considered another limitation. We deliberately chose to include all types of study designs and guidelines without limitations in order to capture all required competencies. We gave equal weight to all included guidelines and articles, regardless of the robustness of the underlying methodology. We consider this justified given the purpose of the scoping study, i.e. providing a narrative account of competencies for executing PC-IC and how these can be acquired.

Conclusion

Primary healthcare organizations are redesigning care pathways to better meet the needs of patients with chronic illness and multimorbidity. We identified interprofessional as well as patient care-related competencies to be relevant for the execution of person-centred integrated primary healthcare. Nonetheless, guidelines and articles lack a detailed description of the competencies in terms of knowledge, skills and attitudes and how these can be acquired. Further research in which the core concepts of the required competencies are clearly described is still necessary to properly prepare primary healthcare professionals to offer high value care to patients with chronic diseases and multimorbidity. Educational programs, both undergraduate and postgraduate, should take these competencies into account. A shift towards interprofessional education is necessary to acquire these competencies.

Abbreviations

COPD Chronic Obstructive Pulmonary Disease

ICOPE Integrated care for older people

PC-IC Person-centred integrated care

Declarations

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MLE, EB, MLa performed the literature review. They selected the papers for inclusion based on ab/ti and full txt screening. MLe prepared data-extraction and findings were discussed with EB and MLa. Next, MLe drafted first manuscript. EB, TS and MLa contributed to the manuscript and commented on and discussed successive drafts of the paper. All the authors read and approved the final manuscript.

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Appendix 1

Embase 18-9-2020

1 exp primary health care/ OR general practice/ OR (((General OR Primary OR famil*) ADJ1 (care OR healthcare OR medicine OR practice*)) OR (community ADJ1 based)).ti,ab,kw.

2 ((comprehensive OR coordinated OR Integrated OR seamless) ADJ1 (care OR healthcare)).ti,ab,kw.

3 exp multidisciplinary team/ OR ((Inter OR multi OR interagency*) ADJ1 (collaborat* OR team* OR cooperation*) OR Multidisciplinar* OR Interdisciplinar* OR ((Inter OR multi) ADJ1 (disciplinar* OR colaborat*)) OR (Collaborative ADJ1 practice*) OR IPC OR (Chronic ADJ1 (care OR healthcare) ADJ1 model) OR Network*).ti,ab,kw.

4 shared decision making/ OR (SDM OR (Shared ADJ1 decision ADJ1 making) OR (patient ADJ1 (centered OR centred) ADJ1 care) OR (patient ADJ1 (centeredness OR engagement))))).ti,ab,kw.

5 2 OR 3 OR 4

6 comorbidity/ OR exp multiple chronic conditions/ OR (Multimorbidit* OR Comorbidit* OR (multiple ADJ1 chronic ADJ1 condition*) OR (Chronic ADJ1 (illness OR disease*)) OR "Multi-morbidity" OR (multiple ADJ1 chronic ADJ1 condition*)).ti,ab,kw.

7 clinical competence/ OR aptitude/ OR (aptitude* OR capabilit* OR competenc* OR expertise OR proficien* OR skill*).ti,ab,kw.

8 1 AND 5 AND 6 AND 7

9 limit 8 to conference abstract status

10 8 NOT 9

Medline 18-9-2020

S1 MH "Primary Health Care" OR MH "Family Practice" OR TI (((General OR Primary OR famil*) N1 (care OR healthcare OR medicine OR practice*)) OR (community N1 based)) OR AB (((General OR Primary OR famil*) N1 (care OR healthcare OR medicine OR practice*)) OR (community N1 based)) OR SU (((General OR Primary OR famil*) N1 (care OR healthcare OR medicine OR practice*)) OR (community N1 based))

S2 TI ((comprehensive OR coordinated OR Integrated OR seamless) N1 (care OR healthcare)) OR AB ((comprehensive OR coordinated OR Integrated OR seamless) N1 (care OR healthcare)) OR SU ((comprehensive OR coordinated OR Integrated OR seamless) N1 (care OR healthcare))

S3 MH "Patient Care Team" OR TI ((Inter OR multi OR interagenc*) N1 (collaborat* OR team* OR cooperation*) OR Multidisciplinar* OR Interdisciplinar* OR ((Inter OR multi) N1 (disciplinar* OR colaborat*)) OR (Collaborative N1 practice*) OR IPC OR (Chronic N1 (care OR healthcare) N1 model) OR Network*) OR AB ((Inter OR multi OR interagenc*) N1 (collaborat* OR team* OR cooperation*) OR Multidisciplinar* OR Interdisciplinar* OR ((Inter OR multi) N1 (disciplinar* OR colaborat*)) OR (Collaborative N1 practice*) OR IPC OR (Chronic N1 (care OR healthcare) N1 model) OR Network*) OR SU ((Inter OR multi OR interagenc*) N1 (collaborat* OR team* OR cooperation*) OR Multidisciplinar* OR Interdisciplinar* OR ((Inter OR multi) N1 (disciplinar* OR colaborat*)) OR (Collaborative N1 practice*) OR IPC OR (Chronic N1 (care OR healthcare) N1 model) OR Network*)

S4 MH "Decision Making, Shared" OR TI (SDM OR (Shared N1 decision N1 making) OR (patient N1 (centered OR centred) N1 care) OR (patient N1 (centeredness OR engagement))) OR AB (SDM OR (Shared N1 decision N1 making) OR (patient N1 (centered OR centred) N1 care) OR (patient N1 (centeredness OR engagement))) OR SU (SDM OR (Shared N1 decision N1 making) OR (patient N1 (centered OR centred) N1 care) OR (patient N1 (centeredness OR engagement)))

S5 S2 OR S3 OR S4

S6 MH "Comorbidity" OR TI (Multimorbidit* OR Comorbidit* OR (multiple N1 chronic N1 condition*) OR (Chronic N1 (illness OR disease*)) OR "Multi-morbidity" OR (multiple N1 chronic N1 condition*)) OR AB (Multimorbidit* OR Comorbidit* OR (multiple N1 chronic N1 condition*) OR (Chronic N1 (illness OR disease*)) OR "Multi-morbidity" OR (multiple N1 chronic N1 condition*)) OR SU (Multimorbidit* OR Comorbidit* OR (multiple N1 chronic N1 condition*) OR (Chronic N1 (illness OR disease*)) OR "Multi-morbidity" OR (multiple N1 chronic N1 condition*))

S7 MH "Clinical Competence+" OR MH "Aptitude" OR TI (aptitude* OR capabilit* OR competenc* OR expertise OR proficien* OR skill*) OR AB (aptitude* OR capabilit* OR competenc* OR expertise OR proficien* OR skill*) OR SU (aptitude* OR capabilit* OR competenc* OR expertise OR proficien* OR skill*)

S8 S1 AND S5 AND S6 AND S7

PubMed 14-9-2020

#1 "Primary Health Care"[mesh] OR "Family Practice"[mesh] OR Primary care[tiab] OR primary health care[tiab] OR General medicine[tiab] OR General healthcare[tiab] OR General practice[tiab] OR Family practice[tiab] OR family care[tiab] OR family practice[Mesh] OR community based[tiab] OR primary practice*[tiab]

#2 Integrated care[tiab] OR integrated healthcare[tiab] OR coordinated care[tiab] OR comprehensive care[tiab] OR seamless care[tiab]

#3 "Patient Care Team"[Mesh:NoExp] OR patient care team*[ti] OR Interprofessional collaboration[tiab] OR (intersectoral[tiab] AND teamwork[tiab]) OR interagency cooperation[tiab] OR multidisciplinary[tiab] OR interdisciplinary[tiab] OR Collaborative practice*[tiab] OR IPC[tiab] OR Intersectoral Collaboration[MeSH Terms] OR Chronic care model[tiab] OR chronic care[tiab] OR network[tiab]

#4 "Decision Making, Shared"[Mesh] OR SDM[tiab] OR Shared decision making[tiab] OR patient centered care[tiab] OR patient centeredness[tiab] OR patient engagement[tiab]

#5 #2 OR #3 OR #4

#6 "Comorbidity"[Mesh] OR multimorbidit*[tiab] OR Comorbidit*[tiab] OR multiple chronic condition*[tiab] OR Chronic illness[tiab] OR chronic disease[tiab] OR Multi-morbidity[tiab] OR multiple chronic condition*[tiab]

#7 Clinical Competence[MeSH Terms] OR "Aptitude"[Mesh] OR aptitude*[tiab] OR capabilit*[tiab] OR competenc*[tiab] OR expertise[tiab] OR proficienc*[tiab] OR skill*[tiab]

#8 #1 AND #5 AND #6 AND #7

Cochrane 18-9-2020

#1 (((General OR Primary OR famil*) NEAR/1 (care OR healthcare OR medicine OR practice*)) OR (community NEAR/1 based)):ti,ab,kw

#2 ((comprehensive OR coordinated OR Integrated OR seamless) NEAR/1 (care OR healthcare)):ti,ab,kw

#3 ((Inter OR multi OR interagenc*) NEAR/1 (collaborat* OR team* OR cooperation*) OR Multidisciplinar* OR Interdisciplinar* OR ((Inter OR multi) NEAR/1 (disciplinar* OR colaborat*)) OR (Collaborative NEAR/1 practice*) OR IPC OR (Chronic NEAR/1 (care OR healthcare) NEAR/1 model) OR Network*):ti,ab,kw

#4 (SDM OR (Shared NEAR/1 decision NEAR/1 making) OR (patient NEAR/1 (centered OR centred) NEAR/1 care) OR (patient NEAR/1 (centeredness OR engagement))):ti,ab,kw

#5 #2 OR #3 OR #4

#6 (Multimorbidit* OR Comorbidit* OR (multiple NEAR/1 chronic NEAR/1 condition*) OR (Chronic NEAR/1 (illness OR disease*)) OR "Multi-morbidity" OR (multiple NEAR/1 chronic NEAR/1 condition*)):ti,ab,kw

#7 (aptitude* OR capabilit* OR competenc* OR expertise OR proficien* OR skill*):ti,ab,kw

#8 #1 AND #5 AND #6 AND #7

Cinahl 14-9-2020

S1 MH "Primary Health Care" OR MH "Family Practice" OR TI (((General OR Primary OR famil*) N1 (care OR healthcare OR medicine OR practice*)) OR (community N1 based)) OR AB (((General OR Primary OR famil*) N1 (care OR healthcare OR medicine OR practice*)) OR (community N1 based)) OR SU (((General OR Primary OR famil*) N1 (care OR healthcare OR medicine OR practice*)) OR (community N1 based))

S2 TI ((comprehensive OR coordinated OR Integrated OR seamless) N1 (care OR healthcare)) OR AB ((comprehensive OR coordinated OR Integrated OR seamless) N1 (care OR healthcare)) OR SU ((comprehensive OR coordinated OR Integrated OR seamless) N1 (care OR healthcare))

S3 MH "Multidisciplinary Care Team" OR TI ((Inter OR multi OR interagenc*) N1 (collaborat* OR team* OR cooperation*) OR Multidisciplinar* OR Interdisciplinar* OR ((Inter OR multi) N1 (disciplinar* OR colaborat*)) OR (Collaborative N1 practice*) OR IPC OR (Chronic N1 (care OR healthcare) N1 model) OR Network*) OR AB ((Inter OR multi OR interagenc*) N1 (collaborat* OR team* OR cooperation*) OR Multidisciplinar* OR Interdisciplinar* OR ((Inter OR multi) N1 (disciplinar* OR colaborat*)) OR (Collaborative N1 practice*) OR IPC OR (Chronic N1 (care OR healthcare) N1 model) OR Network*) OR SU

((Inter OR multi OR interagenc*) N1 (collaborat* OR team* OR cooperation*) OR Multidisciplinar* OR Interdisciplinar* OR ((Inter OR multi) N1 (disciplinar* OR colaborat*)) OR (Collaborative N1 practice*) OR IPC OR (Chronic N1 (care OR healthcare) N1 model) OR Network*)

S4 MH "Decision Making, Shared" OR TI (SDM OR (Shared N1 decision N1 making) OR (patient N1 (centered OR centred) N1 care) OR (patient N1 (centeredness OR engagement))) OR AB (SDM OR (Shared N1 decision N1 making) OR (patient N1 (centered OR centred) N1 care) OR (patient N1 (centeredness OR engagement))) OR SU (SDM OR (Shared N1 decision N1 making) OR (patient N1 (centered OR centred) N1 care) OR (patient N1 (centeredness OR engagement)))

S5 S2 OR S3 OR S4

S6 MH "Comorbidity" OR TI (Multimorbidit* OR Comorbidit* OR (multiple N1 chronic N1 condition*) OR (Chronic N1 (illness OR disease*)) OR "Multi-morbidity" OR (multiple N1 chronic N1 condition*)) OR AB (Multimorbidit* OR Comorbidit* OR (multiple N1 chronic N1 condition*) OR (Chronic N1 (illness OR disease*)) OR "Multi-morbidity" OR (multiple N1 chronic N1 condition*)) OR SU (Multimorbidit* OR Comorbidit* OR (multiple N1 chronic N1 condition*) OR (Chronic N1 (illness OR disease*)) OR "Multi-morbidity" OR (multiple N1 chronic N1 condition*))

S7 MH "Clinical Competence+" OR MH "Aptitude" OR TI (aptitude* OR capabilit* OR competenc* OR expertise OR proficien* OR skill*) OR AB (aptitude* OR capabilit* OR competenc* OR expertise OR proficien* OR skill*) OR SU (aptitude* OR capabilit* OR competenc* OR expertise OR proficien* OR skill*)

S8 S1 AND S5 AND S6 AND S7

Cinahl 14-9-2020

S1 MH "Primary Health Care" OR MH "Family Practice" OR TI (((General OR Primary OR famil*) N1 (care OR healthcare OR medicine OR practice*)) OR (community N1 based)) OR AB (((General OR Primary OR famil*) N1 (care OR healthcare OR medicine OR practice*)) OR (community N1 based)) OR SU (((General OR Primary OR famil*) N1 (care OR healthcare OR medicine OR practice*)) OR (community N1 based))

S2 TI ((comprehensive OR coordinated OR Integrated OR seamless) N1 (care OR healthcare)) OR AB ((comprehensive OR coordinated OR Integrated OR seamless) N1 (care OR healthcare)) OR SU ((comprehensive OR coordinated OR Integrated OR seamless) N1 (care OR healthcare))

S3 MH "Multidisciplinary Care Team" OR TI ((Inter OR multi OR interagenc*) N1 (collaborat* OR team* OR cooperation*) OR Multidisciplinar* OR Interdisciplinar* OR ((Inter OR multi) N1 (disciplinar* OR colaborat*)) OR (Collaborative N1 practice*) OR IPC OR (Chronic N1 (care OR healthcare) N1 model) OR Network*) OR AB ((Inter OR multi OR interagenc*) N1 (collaborat* OR team* OR cooperation*) OR Multidisciplinar* OR Interdisciplinar* OR ((Inter OR multi) N1 (disciplinar* OR colaborat*)) OR (Collaborative N1 practice*) OR IPC OR (Chronic N1 (care OR healthcare) N1 model) OR Network*) OR SU ((Inter OR multi OR interagenc*) N1 (collaborat* OR team* OR cooperation*) OR Multidisciplinar* OR

Interdisciplinary* OR ((Inter OR multi) N1 (disciplinary* OR colaborat*)) OR (Collaborative N1 practice*) OR IPC OR (Chronic N1 (care OR healthcare) N1 model) OR Network*)

S4 MH "Decision Making, Shared" OR TI (SDM OR (Shared N1 decision N1 making) OR (patient N1 (centered OR centred) N1 care) OR (patient N1 (centeredness OR engagement))) OR AB (SDM OR (Shared N1 decision N1 making) OR (patient N1 (centered OR centred) N1 care) OR (patient N1 (centeredness OR engagement))) OR SU (SDM OR (Shared N1 decision N1 making) OR (patient N1 (centered OR centred) N1 care) OR (patient N1 (centeredness OR engagement)))

S5 S2 OR S3 OR S4

S6 MH "Comorbidity" OR TI (Multimorbidit* OR Comorbidit* OR (multiple N1 chronic N1 condition*) OR (Chronic N1 (illness OR disease*)) OR "Multi-morbidity" OR (multiple N1 chronic N1 condition*)) OR AB (Multimorbidit* OR Comorbidit* OR (multiple N1 chronic N1 condition*) OR (Chronic N1 (illness OR disease*)) OR "Multi-morbidity" OR (multiple N1 chronic N1 condition*)) OR SU (Multimorbidit* OR Comorbidit* OR (multiple N1 chronic N1 condition*) OR (Chronic N1 (illness OR disease*)) OR "Multi-morbidity" OR (multiple N1 chronic N1 condition*))

S7 MH "Clinical Competence+" OR MH "Aptitude" OR TI (aptitude* OR capabilit* OR competenc* OR expertise OR proficien* OR skill*) OR AB (aptitude* OR capabilit* OR competenc* OR expertise OR proficien* OR skill*) OR SU (aptitude* OR capabilit* OR competenc* OR expertise OR proficien* OR skill*)

S8 S1 AND S5 AND S6 AND S7

Trip database 24-08-2020

("Integrated care" OR "Aligning policy integrated care" OR "integrated healthcare" OR "coordinated care" OR "comprehensive care" OR "seamless care") AND ("Chronic illness" OR "chronic disease" OR "chronic condition" OR multimorbidity OR Comorbidity OR "co-occurring chronic illnesses" OR "multiple chronic condition") AND ("Primary care" OR "primary health care" OR "General medicine" OR "General healthcare" OR "General practice" OR "Family practice" OR "family care" OR "community based")

Figures

Figure 1

Flow chart describing the process of the review of clinical guidelines and scientific peer-reviewed articles