jamk.fi

Author(s): Rodríguez-Monforte, Míriam; Fernández-Jané, Carles; Bracha, Marietta; Bartoszewska, Adrianna; Kozakiewicz, Mariusz; Leclerc, Mariel; Nimani, Endrit; Soanvaara, Pauliina; Jarvinen, Sari; Sherpenseel, Meike van; Valde, Miriam van der; Lopes, António Alves; Handgraaf, Marietta; Grüneberg, Christian; Carrillo-Alvarez, Elena

Title: Defining a competency framework for health and social professionals to promote healthy ageing throughout the lifespan: an international Delphi study

Year: 2024

Version: Published version / Publisher pdf

Please cite the original version:

Rodríguez-Monforte, M., Fernández-Jané, C., Bracha, M., Bartoszewska, A., Kozakiewicz, M., Leclerc, M., Nimani, E., Soanvaara, P., Jarvinen, S., Sherpenseel, M. van, Valde, M. van der, Lopes, A. A., Handgraaf, M., Grüneberg, C. & Carrillo-Alvarez, E. (2024). Defining a competency framework for health and social professionals to promote healthy ageing throughout the lifespan: an international Delphi study. Advances in Health Sciences Education. https://doi.org/10.21203/rs.3.rs-3128044/v1

Defining a competency framework for health and social professionals to promote healthy ageing throughout the lifespan: an international Delphi study

Míriam Rodríguez-Monforte
Blanquerna School of Health Sciences - Ramon Llull University

Carles Fernández-Jané
cfernandezja@tecnocampus.cat

Escola Superior de Ciències de la Salut, Universitat Pompeu Fabra

Marietta Bracha
Nicolaus Copernicus University

Adrianna Bartoszewska
Nicolaus Copernicus University

Mariusz Kozakiewicz
Nicolaus Copernicus University

Mariel Leclerc
Heimerer College

Endrit Nimani
Heimerer College

Pauliina Soanvaara
JAMK University of Applied Sciences

Sari Jarvinen
JAMK University of Applied Sciences

Meike van Sherpenseel
HU University of Applied Sciences Utrecht

Miriam van der Valde
HU University of Applied Sciences Utrecht

António Alves Lopes
Escola Superior de Saúde do Alcoitão

Marietta Handgraaf
HS Bochum University of Applied Sciences

Christian Grüneberg
HS Bochum University of Applied Sciences

Elena Carrillo-Alvarez
Blanquerna School of Health Sciences - Ramon Llull University

Abstract

Purpose: The promotion of healthy ageing has become a priority in most parts of the world, and it should be promoted at all ages. However, baseline training of health and social professionals is currently not adequately tailored to face these challenges. This paper reports the results of a Delphi study conducted to reach expert agreement about health and social professionals' competencies to promote healthy ageing throughout the lifespan within the SIENHA project. Materials and

Methods: This study was developed following the CREDES standards. The initial version of the competence framework was based on the results of a scoping review and built following the CanMEDS model. The expert panel consisted of a purposive sample of twenty-two experts in healthy ageing with diverse academic and clinical backgrounds, fields and years of expertise from seven European countries. Agreement was reached after three rounds.

Results: The final framework consisted of a set of 18 key competencies and 80 enabling competencies distributed across six domains.

Conclusions: The SIENHA competence framework for healthy ageing may help students, and educators, to enrich their learning, and the academic content of their subjects or/and programmes and incentivize innovation.

Introduction

The promotion of healthy ageing has become a priority in most parts of the world. Once considered to concern solely older adults, there is growing consensus that healthy ageing should be promoted at all ages (Chen, 2016; Michel et al., 2016).

On 15 November 2022, the world population was estimated to have reached 8 billion, but the European population is expected to shrink by 30.8 million (-6.9%) from 2019 to 2100, with an uneven reduction across age groups. The share of people aged 65 and over is likely to increase by 11%, reaching a total of 130.2 million by 2100 (Eurostat 2023).

Such projections for more than 70 years ahead provide a unique opportunity to plan for future realities. Indeed, the United Nations (2022) urged regions with ageing populations to take steps to prepare their countries for the changing needs of the ageing population. Naturally, preparing for aged societies means not only arranging what will be needed for the increased over-65 population, but specifically requires deploying the means so that people who will be aged 65 in ten, twenty, fifty or seventy years reach old age in the best possible conditions.

Ageing starts from conception, and the life course perspective studies how intrinsic and extrinsic exposure from the intrauterine medium and throughout a person's lifetime result in variations in individuals' rate and quality of ageing (Hanson et al. 2016). This approach focuses on various factors, life opportunities and choices that might significantly influence health status, lifestyle, as well as health and social inequalities in older age, and challenges the focus of most research on the topic, which exclusively investigates the effect of influences at work in the later stages of life (Grundy et al. 2013; Kuh et al. 2013).

Lifestyle factors such as dietary habits, physical activity, smoking and alcohol consumption; psychosocial aspects like social participation, social support and social networks; adjustment to retirement; and more upstream determinants like social status, education and income have been identified as playing an important role in achieving healthy ageing in European populations and are aspects to be addressed by policy-makers (Sowa et al. 2016). Differences within and between countries exist and must be taken into account: elderly people living in western Europe report greater wellbeing in old age than those in the southern and central-eastern European countries. Differences between sexes are particularly wide in the southern region, with women reporting lower levels of healthy ageing.

Sadana et al. (Sadana et al. 2016) investigated the origins, pathways and opportunities to intervene to reduce inequities in healthy ageing. They identify specific areas of intervention for children and adolescents, young adults, adults and older adults (e.g., family policies, early child development activities, labour market and employment conditions, actions to reduce the exposure to risk factors of NCDs and CDs, universal insurance schemes, adequate infrastructures, etc.) and cross-sectional actions along the life-course, directly related to health and health-care systems. In this regard, their results stress how the social and health workforce must be better equipped to promote healthy ageing throughout the lifespan, to satisfy the needs of new older adults in all their diversity from the point of view of both health and welfare advocacy and organization/management, and to not reinforce inequities.

The SIENHA project (Strategic, Innovative, Educational Network for Healthy Ageing 2020-1-ES01-KA203-083121) is an EU-funded initiative that intends to contribute to this challenge by transforming the understanding and supporting the continuous development of competencies of students, teachers and professionals to foster healthy ageing across Europe. To this end, the project will develop a framework of competencies in Healthy Ageing, a curriculum in Healthy Ageing, an innovation and research Toolkit in Healthy Ageing, all included in a Handbook on Healthy Ageing. This paper reports the results of a Delphi study conducted with the aim of reaching expert agreement about health and social professionals' competencies to promote healthy ageing throughout the lifespan.

Materials and Methods

Study design:

The Delphi technique was chosen in order to identify the relevance and reach consensus, for health and social professionals, of the competencies for healthy ageing based on the competency framework constructed by the SIENHA Consortium (Brown, 1968; Jünger et al. 2017). In order to allow critical appraisal of the methodology and resulting guidance, our study followed CREDES, a reporting standard for Conducting and REporting of DElphi Studies (Jünger et al. 2017).

Competency Framework construction:

The initial step of the SIENHA Project involved conducting a scoping review to identify and reflect upon the competencies for health and social professionals related to healthy ageing, complemented by stakeholder meetings with experts within the field of healthy ageing (SIENHA, 2022). This initial step was followed by various discussion sessions within the SIENHA Consortium involving critical dialogue and debate, led by two experts in pedagogy with the aim of operationalizing the competencies identified using the CanMEDS Competency Framework role model (Royal College of Physicians and Surgeons of Canada, 2015). CanMEDS is an internationally recognized framework used as a basis for educational and practice standards in many countries. Originally, it has been used in medical education, however, today, it has also been transferred for defining competency descriptions within various health professions (Dijkman et al. 2016).

Health and social professionals have their own body of knowledge, skills and attitudes. When focusing on healthy ageing, the emphasis, in addition to the primary focus of one's own profession, was on prevention of health problems throughout the lifespan, in the broadest sense of the term, associated with ageing. Thus, the focus on healthy ageing was reflected on an individual level and on the level of communities and/or populations. Based on this idea, the key competencies and the enabling competencies were described and integrate the different roles of the CanMEDS framework: 1) Health and Welfare Advocate; 2) Communicator; 3) Collaborator; 4) Leader; 5) Scholar; and 6) Professional, with the focus on the prevention of health problems related to healthy ageing. In this perspective of healthy ageing, the individual level and the level of communities and populations fits within the role of the health and welfare advocate. Therefore, it was decided not to formulate competencies for the role of an expert.

Design and procedure of the Delphi study:

A protocol was designed and approved by the SIENHA Consortium in order to guide the steps of the Delphi study. Additionally, a steering group was formed that met at key stages to oversee participant recruitment, data analysis, study development and the dissemination of the findings. The steering group consisted of five members (three study investigators and two external members).

Delphi study participants:

The expert panel consisted of a purposive sample of experts in healthy ageing with academic and clinical backgrounds, comprising academic experts with a minimum of two peer-reviewed publications on healthy ageing in the past five years, and active professionals with a minimum experience of five years in the same field of practice (clinical or social), and with a minimum 5 years' experience in research. In order to establish a representative sample, we followed the criteria established by Jorm et al. (2015) who describe stability in findings with panels of around 20 or more members. Considering a 30% rejection rate, 27 experts were invited to participate in the study and contacted by the different project partners of whom 22 agreed to participate. Participants were unknown to each other, but not to the researchers. Panel members were assured all information would be confidential and comply with the research data security policies.

The ethics committee of the Ramon Llull University approved the study (CER URL_2022_2023_006). All participants' identities were kept anonymous by using codes. Participants received information about the study with the invitation to participate and prior informed consent was obtained from the respondents to participate in this study.

Delphi study procedure:

The key and enabling competencies were included in a survey form. Using the Welphi Platform (Welphi, 2023), a Delphi process was designed to run until consensus was met or for a maximum of three rounds as response exhaustion usually occurs within several rounds (Fig. 1).

Each round's questionnaire was piloted with the steering group testing readability, relevance, and appropriateness. Feedback and changes suggested by the steering group were agreed to between the study co-authors before implementation of the following round.

In the first round, competencies were ranked from high to low relevance using, initially (first round) a five-point Likert scale (1 = not at all relevant (must not include), 5 = very relevant (must include) in response to the question 'Is this competency relevant to health/social professionals in the provision of healthy ageing throughout the lifespan? Suggestions for additional recommendations and the reason for them were sought by including a final section for qualitative inputs.

After the first round, based on the results and the steering group consensus, the Likert scale was adapted to a four-point scale (1: not at all relevant; 2: not relevant; 3: relevant; 4: very relevant) in order to avoid middle-range ratings (3 in the 5-point Likert scale) which were very common in the first round and with no additional feedback on the reason for the selection.

The competencies suggested by participants were analysed inductively based on the text material: competencies with the same content were combined, and inadequately described competencies were reworded (Supplemental online material).

Data collection and consensus definition:

Round 1 of the Delphi survey included all competencies specified in the constructed framework and was designed to take approximately < 60 min to complete with subsequent rounds taking less time to complete as the number of competencies for consideration became fewer.

Following the initial invitation, panel members were given 10 days to provide their consent to participate and 15 days to respond between each round. Up to four reminders were sent in each round.

We used 75% agreement on the rating of relevance of the recommendation for determining consensus (Diamond et al. 2014; Gibson et al. 2021)

The ranked competencies were divided into two relevance groups: Group 1 must include (at least 75% of the respondents awarding 3 or 4 on the Likert scale); Group 2 must not include, not relevant (at least 75% awarding 1 or 2).

Competencies rated as "must not include" by 75% or more of the respondents were eliminated from the list. The panel's aggregate responses for each competency from rounds 1 and 2 were noted beside each competency as a percent of "must not include" and "must include". The changes made based on the qualitative feedback of the expert panel were also pointed out to the participants in rounds 2 and 3 by changing the font colour of the modifications (Penciner et al. 2011).

Participant demographics (gender, age, country of citizenship, level of education, field of studies, and work) were collected.

The responses from each round were aggregated and fed back to the panel members anonymously in the following round.

Data analysis

Descriptive statistics on the demographics of the experts were developed. Each participant was linked to a master code. The statistics also included mean, median, and standard deviation. For the analysis, we used Welphi and Excel®.

Additionally, the construction of the initial SIENHA Competency Framework based on the CanMEDS Framework as well as the analysis and agreement achieved by the five members of the steering group before each Delphi round was developed through critical dialogue and debate within the different teams (McCormack and McCance, 2006).

Results

Demographic data of participants

In total, a mean of 18 experts participated in our study (1st round: 22; 2nd round: 16; 3rd round: 17). The majority were female in all rounds (1st round: 68.18%; 2nd round: 75%; 3rd round: 64.7%). The mean age was 46.4 years ± 10.8 SD. The field of studies comprised nursing, physiotherapy, nutrition and dietetics, medicine, psychology, geriatrics, and social and healthcare with median experience in the field of 15.5 years (± 4.55 SD).

The level of education included master's degree (30.14%); doctoral degree (66.7%) and one participant was a professional fellow.

The demographic characteristics of the participants can be found in Table 1.

Table 1
Sociodemographic characteristics of study participants

	R1		R2		R3	
	n	%	n	%	n	%
Participants in each Delphi round (22 participants agreed to participate)	21	95.45	16	72.72	17	77.27
Gender	n	%	n	%	n	%
Female	15	71.42	12	75	11	64.7
Age	Mean	SD	Mean	SD	Mean	SD
	48.1	10.73	45.6	12.7	45.7	9
Country of citizenship	n	%	n	%	n	%
Poland	4	19	4	25	4	23.5
Finland	3	14.2	2	12.5	3	17.6
Germany	0	-	2	12.5	3	17.6
Kosovo	1	4.76	1	6.25	1	5.8
Portugal	0	-	1	6.25	0	-
The Netherlands	4	19	2	12.5	2	11.7
Spain	2	9.5	2	12.5	2	11.7
France	1	4.76	0	-	0	-
Norway	1	4.76	1	6.25	1	5.8
UK	1	4.76	1	6.25	1	5.8
Degree of education	n	%	n	%	n	%
Doctoral studies	NA	NA	11	68.7	11	64.7
Master	NA	NA	4	25	6	35.29
Fellow professional	NA	NA	1	6.25	0	0
Field of studies and work	n	%	n	%	n	%
Nursing	2	9.5	2	12.5	2	11.76
Physiotherapy	3	14.2	4	25	4	23.52
Nutrition and dietetics	2	9.5	1	6.25	2	11.76
Medicine	3	14.2	2	12.5	2	11.76
Psychology	3	14.2	3	18.75	2	11.76
Social work	1	4.76	0	0	1	5.88
Geriatrics	3	14.2	4	25	2	11.76
Other (education, research, sports)	4	19	0	0	2	11.76

R: delphi round; SD: standard deviation; NA: Non Available

SIENHA competency framework

The initial competency based on the scoping review conducted by the SIENHA Consortium and different discussion sessions agreed on a Framework included six domains (collaborator, communicator, health and welfare advocate, leader, professional, and scholar) with 18 key competencies and 81 enabling competencies. The final model included the same six domains with 18 key competencies and 80

enabling competencies. In the different rounds, 16 competencies were re-formulated; and one enabling competency was added (health and welfare advocate; enabling competency 1.8) (Table 2 and Supplemental online material).

Table 2

Overview of results from the delphi rounds and overall consensus for each round across domains (including key and enabling competencies) and across key competencies of each competency framework domain

	Round 1			Round 2			Round 3		
Domain of the SIENHA Competency Framework on healthy ageing	KC	EC	Consensus achieved *(relevant or very relevant)* %	KC	EC	Consensus achieved *(relevant or very relevant)* %	KC	EC	Consensus achieved *(relevant or very relevant)* %
COLLABORATOR As collaborators, health and social care professionals work together with others to promote and support healthy ageing throughout the lifespan among individuals, groups of individuals and/or communities. The forms of collaboration can involve the individuals' families*, health and social care professionals, community partners and other stakeholders	2	11	89	2	11	98	2	11	100
KC 1: To be able to work effectively with other professionals within and outside the health and social care profession to promote and support healthy ageing throughout the lifespan	Mean ± SD	3.79 ± 0.41	90.47	Mean ± SD	3.87 ± 0.33	100	Mean ± SD	3.87 ± 0.33	100
KC 2: To be able to work effectively with individuals and families to promote and support healthy ageing throughout the lifespan*		3.67 ± 0.74	80.95		3.75 ± 0.43	100		3.75 ± 0.43	100

KC: key competency; EC: enabling competency

COMMUNICATOR	3	17	91	3	17	98	3	17	99.11
As Communicators, health and social care professionals form positive relationships with the individuals and their families, facilitating the gathering and sharing of essential information related to healthy ageing. Using person-centered communication, they support and advise individuals in shared decision-making and lead effective interactions that promote health and well-being									
KC 1: To be able to communicate effectively with individuals, families and stakeholders to establish strong positive relationships with them	*Mean ± SD*	*3.63 ± 0.48*	*90*	*Mean ± SD*	*3.56 ± 0.50*	*100*	*Mean ± SD*	*3.56 ± 0.50*	*100*
KC 2: To be able to stimulate and encourage individuals, their families and stakeholders regarding healthy ageing		*3.63 ± 0.48*	*90*		*3.75 ± 0.43*	*100*		*3.75 ± 0.43*	*100*
KC 3: To be able to advice and support individuals, families and stakeholders regarding healthy ageing / OR self-management, self-reliance and co-reliance		*3.6 ± 0.49*	*95*		*3.69 ± 0.46*	*100*		*3.69 ± 0.46*	*100*

KC: key competency; EC: enabling competency

HEALTH AND WELFARE ADVOCATE	5	24	84	5	23	98	5	23	99.36
As Health and Welfare Advocates, health professionals contribute their expertise and influence when working with individuals and their families, communities or populations to promote and support healthy ageing. Health and Welfare advocacy optimizes health across the whole continuum, from the level of individuals to the population at large. The professional as Health and Welfare Advocate can influence change at any level of the continuum to enhance healthy ageing of a society									
KC 1: To be able to perform a person-centered assessment of an individual focusing on the determinants of healthy ageing	Mean ± SD	3.42± 0.59	95	Mean ± SD	3.6± 0.49	100	Mean ± SD	3.6± 0.49	100
KC 2:To be able to establish a plan together with the individual, their families and relevant stakeholders to promote and support healthy ageing		3.44± 0.76	85		3.67± 0.47	100		3.67± 0.47	100
KC 3: To be able to perform actions for the promotion of healthy ageing in individuals		3.65± 0.48	85		3.67± 0.47	100		3.67± 0.47	100
KC 4: To be able to evaluate and adjust the plan on a continuing basis		3.59± 0.77	80		3.73± 0.44	100		3.73± 0.44	100

KC: key competency; EC: enabling competency

KC 5: To be able to advocate for the promotion of healthy ageing with, and on behalf of communities, populations and organizations		*3.47± 0.61*	*80*		*3.53± 0.50*	*100*		*3.53± 0.50*	*100*
LEADER	3	11	77	3	11	99	3	11	98.66
As Leaders, health and social care professionals engage with others to contribute to a vision on healthy ageing and take responsibility for the quality of health and social care in the field of healthy ageing. They function as individual care professionals, as members of teams, and as participants and leaders in health and social care at different levels (regionally, nationally etc.)									
To be able to articulate and act on both a personal vision on healthy ageing as well as a common vision shared with others	Mean ± SD	*3.35± 0.59*	*80*	Mean ± SD	*3.37± 0.48*	*100*	Mean ± SD	*3.37± 0.48*	*100*
To be able to contribute to the quality of health and social care in the domain of healthy ageing		*3.56± 0.79*	*75*		*3.62± 0.48*	*100*		*3.62± 0.48*	*100*
To be able to demonstrate leadership in the domain of healthy ageing		*3.55± 0.60*	*85*		*3.44± 0.50*	*100*		*3.44± 0.50*	*100*

KC: key competency; EC: enabling competency

PROFESSIONAL As Professionals, health and social care professionals are committed to the health, well-being and healthy ageing of individuals and the society through ethical practice, high personal standards of behaviour, accountability to the profession and society, physician-led regulation, and maintenance of personal health.	2	8	91	2	8	97	2	8	98.66
KC 1: To be able to apply best practices and adhere to high ethical standards	*Mean ± SD*	*3.79 ± 0.41*	*95*	*Mean ± SD*	*3.87 ± 0.33*	*100*	*Mean ± SD*	*3.87 ± 0.33*	*100*
KC 2: To be able to recognize and respond to societal expectations and knowledge gaps within the healthy ageing domain		*3.59 ± 0.49*	*85*		*3.56 ± 0.50*	*100*		*3.56 ± 0.50*	*100*
SCHOLAR As scholars, health and social care professionals demonstrate a lifelong commitment to expand professional expertise in the field of healthy ageing through continuous learning. They interpret evidence based results of research and contribute to the development of knowledge and practical research in relation to the provision of care and support of individuals and their families.	3	10	86	3	10	99	3	10	99.4

KC: key competency; EC: enabling competency

KC 1: To be able to engage in the continuous enhancement of their professional activities through ongoing learning	Mean ± SD	3.39 ± 0.59	85	Mean ± SD	3.44 ± 0.50	100	Mean ± SD	3.44 ± 0.50	100
KC 2: To be able to integrate best available evidence into practice		3.63 ± 0.48	95		3.81 ± 0.39	100		3.81 ± 0.39	100
KC 3: To be able to contribute to the creation and dissemination of knowledge and practices applicable to health		3.53 ± 0.50	85		3.44 ± 0.61	93		3.53 ± 0.50	100
KC: key competency; EC: enabling competency									

Round 1

The first round was conducted from January until February 2022. Once the 22 experts agreed to participate in our study, an invitation email was sent with the link to access the online platform with the questionnaire. The first part of the questionnaire consisted of sociodemographic data. The second part included the competencies to be ranked based on the constructed Competency Framework. After the first round was completed, the steering group met to discuss the results and agree on the content of round two. Some competencies, based on the comments of the panel of experts, were reformulated or clarified and one new competency was also included (Supplemental online material). The steering group also highlighted the need, for every competency, to include a clear, more direct question about the reasons behind the choice of rating it relevant or not relevant (especially highlighting when the competency was rated as not relevant). As the majority of the items had achieved 75% agreement on the relevance stipulated in our criteria, in round 2 the questionnaire was re-sent to the experts including the competencies that did not reach 100% agreement showing the percentage of agreement achieved in round 1. The changes made to different competencies were highlighted in red.

Round 2

The second round was conducted from February 2022 until March 2022 and included 16 experts. The level of agreement was almost 100% in all competencies (Table 2). The recommendations, based on the conclusions of the steering group and agreed to with the SIENHA Consortium for round 3 entailed re-ranking the competencies that had not reached 100% agreement, locate in each competency which educational level would apply (master's or bachelor's).

Round 3

The third round was conducted from March 2022 until April 2022 and 17 experts participated. After the completion of the three rounds, the final set of competencies consisted of 18 key competencies and 80 enabling competencies distributed across the six domains, after some minor adjustments agreed to within the steering group and the Consortium, corresponding to the final Competency Framework proposed by the SIENHA Consortium.

In terms of the educational level recommended to achieve the different competencies, the experts recommended that they should be carried out mainly at master's degree level in every domain.

Discussion

To the best of our knowledge, this is the first study to describe the process of defining the competencies for health and social professionals for the promotion of healthy ageing throughout the lifespan. A Delphi study was conducted in order to reach agreement on a Competency Framework, with a final consensus consisting of a set of 18 key competencies and 80 enabling competencies distributed across six domains.

The present study has been conducted following a rigorous process which involved the participation of an international panel of experts with various backgrounds and great expertise on the topic of healthy ageing; the definition of a baseline competency framework by an international, interdisciplinary team and through an iterative process preceded by the elaboration of a scoping review (SIENHA, 2022); the inclusion of a steering group to monitor the entire Delphi study with mid-term discussions with the research team on the consensus of different steps of the Delphi process; and adherence to international guidelines for conducting a Delphi study (Jünger et al. 2017).

Overall, participants on the Delphi panel reached a high consensus on the competencies within the different domains across waves. These results are aligned with recent studies conducted to define the competencies mainly related to medical students (Eskes et al. 2014; Robbrecht et al. 2022; Shah et al. 2020; Sohrmann et al. 2020), but also to other health practitioners such as nurses, midwives, allied health professionals, or pharmacists (Eskes et al. 2014; Janssens et al. 2022; Sanclemente-Dalmau et al. 2022; Westein et al. 2019). Also, in line with some of these studies, our work has a solid foundation as it is based on a rigorous scoping review conducted as a first step (SIENHA, 2022). Additionally, our team also decided that the basis of the Framework needed to be developed following a model that had previously been studied and tested: the CanMEDS Framework, which is the most widely accepted and applied physician competency framework in the world and has been previously adapted to other health disciplines (Janssens et al. 2022). The definition of a competency Framework does not necessarily entail following a previously defined model, however the literature shows that its use helps ensure the quality of the final product with good examples found in the recent work by Robbrecht (2022) or Shah et al (2020).

The domains or dimensions embedded in our framework which were the umbrella for the different key and enabling competencies, were the following: collaborator, communicator, health and welfare advocate, leader, professional, and scholar.

In the different dimensions, some competencies reached 100% agreement in the first round. In the dimension of collaborator, recognizing their own roles and responsibilities related to their profession (EC 1.1); in the dimension of communicator, communicate through a person-centred approach that promotes individual trust and autonomy, characterized by empathy, respect, and compassion (EC 1.1); anticipate and support individual and family needs (EC 1.6); and elicit individuals' (prior) understanding of their health issues in a non-shaming manner (EC 2.1); in the dimension of health and welfare advocate, recognize determinants of healthy ageing (1.1); in the dimension of professional, recognize and respond to ethical issues and apply a reflective ethical practice (EC 1.2); and demonstrate adherence to privacy and confidentiality obligations (EC 1.3). Despite these competencies being a small representation of the overall Framework, the fact that no disagreement existed on the part of any of the experts from the beginning of the study shows the significance given to direct patient attention or care, perhaps downsizing the perspective of health promotion and disease prevention related to healthy ageing. Additionally, when analysing the qualitative data in the different steering group discussions, the comments provided by the panel of experts sustain the trend of considering healthy ageing from the perspective of older adults, obviating the lifespan approach. Some debate has been devoted to this aspect, with the most efforts to prevent and treat the impact of ageing targeting the latter stages of life (WHO 2020). Considering that healthy ageing starts from early childhood, resources should be invested to integrate its importance right from the outset of life primarily focusing on promotion and preventive strategies (Michel et al. 2021), which is something that our framework also intends to specifically sustain by the inclusion of competencies such as "work effectively with individuals and families to promote and support healthy ageing throughout the lifespan"; "recognize and understand the impact of common risks and protective factors in relation to healthy ageing"; "advocate for the promotion of healthy ageing with, and on behalf of communities, populations and organizations" or "engage with key stakeholders to develop and sustain actions to promote healthy ageing".

Moreover, in terms of agreement, no competencies reached 100% consensus in the first round in the scholar or leader dimensions. In fact, through the Delphi study, the leader dimension achieved the least agreement, specifically during the first round (77%).

Some of the comments provided by the experts indicated that a more specific and concrete message was needed in the leader dimension, specifically in enabling competency 1.1 (develop a specific professional vision on healthy ageing); in enabling competency 1.4 (recognize the opportunities to exert influence at various levels achieving multilevel alignment in agendas and actions, in the interests of individuals and their families, other professionals, organizations and society) and in enabling competency 3.1 (demonstrate abilities to lead innovation projects and demonstrate management skills to apply their implementation/creation). After the adjustments agreed on by the steering group and the research team, in the second round, the leader dimension achieved 99% agreement.

The integration of leadership competencies has been discussed in previous work as a major challenge within the curriculum of health professionals (Binnendyk et al. 2021). In fact, some research has shown that the most applied competencies during clinical practice are communicator, professional, and collaborator (Bugaj et al. 2017). The leader dimension was introduced in the CanMEDS Framework as an enhancement (Royal College of Physicians and Surgeons of Canada, 2015). Despite the importance of leadership in healthcare

professions, many curricular itineraries lack this specific theoretical content and also it is difficult to assess in the clinical setting (Maddalena 2016; Sonnenberg et al. 2018; Steinhaeuser et al. 2013).

Due to demographic changes, it is essential that healthcare and social professionals have the required skills, attitudes and knowledge to anticipate and promote healthy ageing. Students of healthcare and social disciplines integrate the core components of their future profession through theoretical and practical learning. In the educational field, following a competency framework for the promotion of healthy ageing can help better define and integrate the core set of skills, attitudes, knowledge and learning outcomes that integrate a healthy ageing vision as contents, teaching and assessment methodologies can be well defined and applied (Binnendyk et al. 2021; Westein et al. 2019). However, developing a competency framework is not an easy task and implies in-depth discussion and constant adaptation to the new realities faced within the discipline and the system (Janssens et al. 2022). Our competency framework involved an additional challenge, which was the inclusion of different professions, thus visions. This last idea could be seen as a limitation, but it was totally balanced by the close collaboration and interprofessional work of the Consortium as well as the feedback given by the panel of experts during the consensus process. However, the analysis on the relevancy of each set of competencies for the different professions involved as well as the level in which they would locate each competency (bachelor's or master's) would be important to develop, which is part of a project that it currently ongoing within our team.

The final set of competencies might help students, and educators, to enrich their learning, and the academic content of their subjects or/and programmes and incentivize innovation. These latter elements can also help improve professional practice, which can also directly benefit from the competency framework by developing guidelines and protocols that integrate the core axes for ethical, up-to-date and person-centred practice, considering the preventive and promotional focuses.

In terms of limitations, some expert profiles were missing on the panel, especially from social disciplines. The number of responses differed from one round to the other, with fewer participants in the second round than in the first and third. However, the inputs of the participants were rich and well-structured and helped the steering group and the consortium improve some of the competencies across the different Delphi rounds. Despite the CanMEDS model being a solid foundation for the development of a new framework, it has some limitations that should be acknowledged, such as the extent to which some of the competencies described are integrated, as discussed by previous authors (Binnendyk et al. 2021). In the final competency framework, despite strong efforts for it to avoid focusing on older adults, some of the competencies might be biased and their interpretation might lead the reader to think of the older adult population. Finally, in some Delphi studies in healthcare, panel members met after conducting the Delphi study. This was not our case. Instead, we held multiple meetings with health and social professionals in the context of the steering group and the project Consortium.

Declarations

Author Contributions

All authors contributed equally to this work.

Acknowledgements:

References

1. Binnendyk, J., Pack, R., Field, E., & Watling, C. (2021). Not wanted on the voyage: highlighting intrinsic CanMEDS gaps in Competence by Design curricula. *Can Med Ed J*. https://doi.org/10.36834/cmej.70950.
2. Brown, B. B. (1968). *Delphi Process: A Methodology Used for the Elicitation of Opinions of Experts*. RAND Corporation.
3. Bugaj, T. J., Schmid, C., Koechel, A., Stiepak, J., Groener, J. B., Herzog, W., & Nikendei, C. (2017). Shedding light into the black box: A prospective longitudinal study identifying the CanMEDS roles of final year medical students' on-ward activities. *Medical Teacher*, *39*, 883–890. https://doi.org/10.1080/0142159X.2017.1309377.
4. Chen, L. K. (2016). Towards the life course approach of healthy aging. *European Geriatric Medicine*, *7*, 289–290. https://doi.org/10.1016/j.eurger.2016.05.010.

5. Diamond, I. R., Grant, R. C., Feldman, B. M., Pencharz, P. B., Ling, S. C., Moore, A. M., & Wales, P. W. (2014). Defining consensus: a systematic review recommends methodologic criteria for reporting of Delphi studies. *Journal Of Clinical Epidemiology*, *67*, 401–409. https://doi.org/10.1016/j.jclinepi.2013.12.002.

6. Dijkman, B., Pétrie, F., Roodbol, Aho, J., Andruszkiewicz, A., Coffey, A., Felsmann, M., Mikkonen, I., Schoofs, G., Soares, C., & Sourtzi, P. (2016). European Core Competences Framework for Health and Social Care Professionals Working with Older People. http://doi.org/10.13140/RG.2.2.15194.08648.

7. Eskes, A. M., Maaskant, J. M., Holloway, S., van Dijk, N., Alves, P., Legemate, D. A., Ubbink, D. T., & Vermeulen, H. (2014). Competencies of specialised wound care nurses: a European Delphi study: Competencies of specialised wound care nurses. *International Wound Journal*, *11*, 665–674. https://doi.org/10.1111/iwj.12027.

8. Eurostat (2023). *Population projections in the EU, [accessed 2023*. Feb 2]. https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Population_projections_in_the_EU.

9. Gibson, C., Goeman, D., Yates, M. W., & Pond, D. Clinical practice guidelines and principles of care for people with dementia: a protocol for undertaking a Delphi technique to identify the recommendations relevant to primary care nurses in the delivery of person-centred dementia care. *British Medical Journal Open* 11, e044843. http://dx.doi.org/10.1136/bmjopen-2020-044843.

10. Grundy, A., Richardson, H., Burstyn, I., Lohrisch, C., SenGupta, S. K., Lai, A. S., Lee, D., Spinelli, J. J., & Aronson, K. J. (2013). Increased risk of breast cancer associated with long-term shift work in Canada. *Occupational And Environmental Medicine*, *70*, 831–838. http://dx.doi.org/10.1136/oemed-2013-101482.

11. Hanson, M. A., Cooper, C., Sayer, A., Eendebak, A., Clough, R. J., & Beard, G. F., J.R (2016). Developmental aspects of a life course approach to healthy ageing: Developmental aspects of healthy ageing. *Journal Of Physiology*, *594*, 2147–2160. https://doi.org/10.1113/JP270579.

12. Janssens, O., Embo, M., Valcke, M., & Haerens, L. (2022). An online Delphi study to investigate the completeness of the CanMEDS Roles and the relevance, formulation, and measurability of their key competencies within eight healthcare disciplines in Flanders. *Bmc Medical Education*, *22*, 260. https://doi.org/10.1186/s12909-022-03308-8.

13. Jorm, A. F. (2015). Using the Delphi expert consensus method in mental health research. *Australian And New Zealand Journal Of Psychiatry*, *49*, 887–897. https://doi.org/10.1177/0004867415600891.

14. Jünger, S., Payne, S. A., Brine, J., Radbruch, L., & Brearley, S. G. (2017). Guidance on Conducting and REporting DElphi Studies (CREDES) in palliative care: Recommendations based on a methodological systematic review. *Palliative Medicine*, *31*, 684–706. https://doi.org/10.1177/0269216317690685.

15. Kuh, D., Cooper, R., Hardy, R., Richards, M., & Ben-Shlomo, Y. (2013). A Life Course Approach to Healthy Ageing. OUP Oxford. https://doi.org/10.1093/acprof:oso/9780199656516.001.0001.

16. Maddalena, V. (2016). Leadership training for undergraduate medical students. *LHS*, *29*, 348–351. https://doi.org/10.1007/s40670-021-01308-9.

17. McCormack, B., & McCance, T. V. (2006). Development of a framework for person-centred nursing. *Journal Of Advanced Nursing*, *56*, 472–479. https://doi.org/10.1111/j.1365-2648.2006.04042.x.

18. Michel, J. P., Dreux, C., & Vacheron, A. (2016). Healthy ageing: Evidence that improvement is possible at every age. *European Geriatric Medicine*, *7*, 298–305. https://doi.org/10.1016/j.eurger.2016.04.014.

19. Michel, J. P., Leonardi, M., Martin, M., & Prina, M. (2021). WHO's report for the decade of healthy ageing 2021–30 sets the stage for globally comparable data on healthy ageing. *The Lancet Healthy Longevity*, *2*, e121–e122. https://doi.org/10.1016/S2666-7568(21)00002-7.

20. Penciner, R., Langhan, T., Lee, R., McEwen, J., Woods, R. A., & Bandiera, G. (2011). Using a Delphi process to establish consensus on emergency medicine clerkship competencies. *Medical Teacher*, *33*, e333–339. https://doi.org/10.3109/0142159X.2011.575903.

21. Robbrecht, M., Norga, K., Van Winckel, M., Valcke, M., & Embo, M. (2022). Development of an integrated competency framework for postgraduate paediatric training: a Delphi study. *Eur J Pediatr*, *181*, 637–646. https://doi.org/10.1007/s00431-021-04237-2.

22. Royal College of Physicians and Surgeons of Canada (2015). CanMEDS Framework, [accessed 2023, Feb 2]. https://canmeds.royalcollege.ca/en/framework.

23. Sadana, R., Blas, E., Budhwani, S., Koller, T., & Paraje, G. (2016). Healthy Ageing: Raising Awareness of Inequalities, Determinants, and What Could Be Done to Improve Health Equity. *The Gerontologist*, *56*, S178–S193. https://doi.org/10.1093/geront/gnw034.

24. Sanclemente-Dalmau, M., Galbany-Estragués, P., Palomar-Aumatell, X., & Rubinat-Arnaldo, E. (2022). Defining competencies for nurse anaesthetists: A Delphi study. *Journal of Advanced Nursing*, *78*, 3696–3709. https://doi.org/10.1111/jan.15348.

25. Shah, S., McCann, M., & Yu, C. (2020). Developing a National Competency-Based Diabetes Curriculum in Undergraduate Medical Education: A Delphi Study. *Canadian Journal of Diabetes*, *44*, 30–36e2. https://doi.org/10.1016/j.jcjd.2019.04.019.

26. SIENHA (2022). Promoting healthy ageing across the lifespan: a scoping review of competences for social and health-care professionals Study protocol [Barcelona (ESP)]. [accessed 2023, Feb 2] https://www.sienha.eu/wp-content/uploads/2022/06/Sienha-scoping-review-protocol.pdf.

27. Sohrmann, M., Berendonk, C., Nendaz, M., Bonvin, R., & The Swiss Working Group for PROFILES Implementation. (2020). Nationwide introduction of a new competency framework for undergraduate medical curricula: a collaborative approach. *Swiss Medical Weekly*, *150*, w20201. https://doi.org/10.57187/smw.2020.20201.

28. Sonnenberg, L. K., Pritchard-Wiart, L., & Busari, J. (2018). The resident physician as leader within the healthcare team: An exploratory inquiry into the perspectives of interprofessional clinicians. *LHS*, *31*, 167–182. https://doi.org/10.1108/LHS-08-2017-0046.

29. Sowa, A., Tobiasz-Adamczyk, B., Topór-Mądry, R., Poscia, A., & la Milia, D. I. (2016). Predictors of healthy ageing: public health policy targets. *Bmc Health Services Research*, *16*, 289. https://doi.org/10.1186/s12913-016-1520-5.

30. Steinhaeuser, J., Chenot, J. F., Roos, M., Ledig, T., & Joos, S. (2013). Competence-based curriculum development for general practice in Germany: a stepwise peer-based approach instead of reinventing the wheel. *Bmc Research Notes*, *6*, 314. https://doi.org/10.1186/1756-0500-6-314.

31. United Nations (2022). World Population Prospects 2022: Summary of Results | Population Division. [accessed 2023, Feb 2] https://www.un.org/development/desa/pd/content/World-Population-Prospects-2022.

32. Welphi (2023). [Lisbon (PT)]: [accessed 2023, Feb 2] https://www.welphi.com/en/Home.html.

33. Westein, M. P. D., de Vries, H., Floor, A., Koster, A. S., & Buurma, H. (2019). Development of a Postgraduate Community Pharmacist Specialization Program Using CanMEDS Competencies, and Entrustable Professional Activities. AJPE 83, 6863. https://doi.org/10.5688/ajpe6863.

34. WHO. (2020). *Decade of Healthy Ageing 2020–2030*. Switzerland: World Health Organization Geneva.

Figures

Preparation Phase
Scoping review
Critical debate with experts

Outcome:
First draft of the SIENHA comptetence framework
6 domains, 18 key competencies and 81 enabling competencies

Round 1
22 experts
6 domains, 18 key competencies and 81 enabling competencies
Competence ranking using a 5 point Likert scale
Open suggestions

Outcome:
Collaborator consensus 89%
Communicator consesnsu 91%
Advocate consensus 84%
Leader consensus 77%
Professional consensus 91%
Scholar consesnus 86%
Adaptation to a 4 point Likert scale
Combination of competencies and reformulation

Round 2
16 experts
6 domains, 18 key competencies and 80 enabling competencies
Re-ranking of the competencies that had not reached 100% agreement using 4 point Likert scale

Outcome:
Collaborator consensu 98%
Communicator consesnsu 98%
Advocate consensus 98%
Leader consensus 99%
Professional consensus 97%
Scholar consesnus 99%

Round 3:
17 experts
6 domains, 18 key competencies and 80 enabling competencies
Educational level for each competency (master's or bachelor's)

Outcome:
Collaborator consensus 100%
Communicator consesnsu 99.1%
Advocate consensus 99.3%
Leader consensus 98.6%
Professional consensus 98.6%
Scholar consesnus 99.4%

Result:
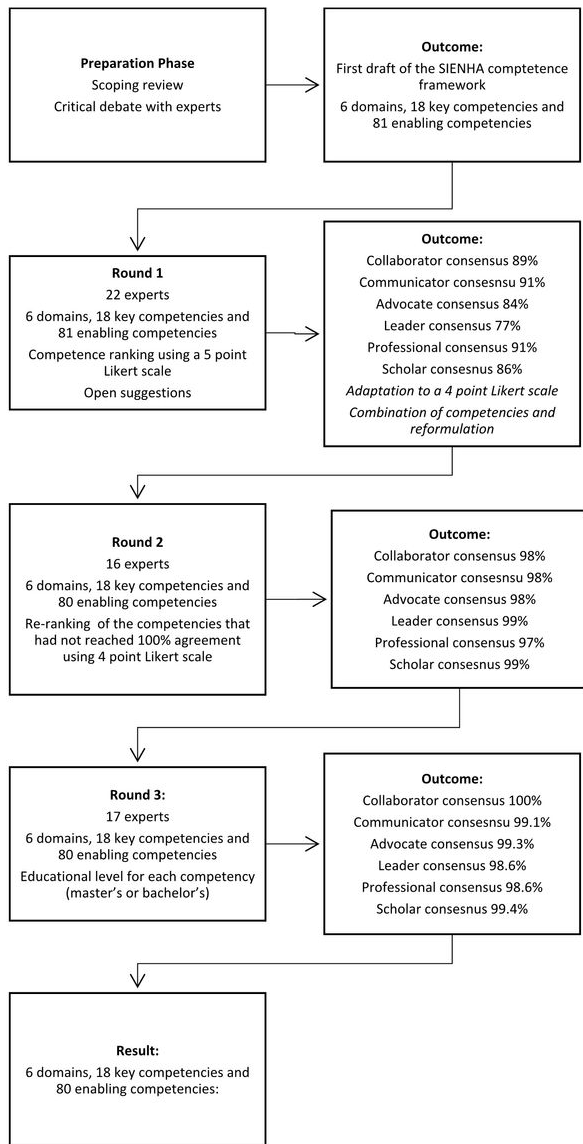6 domains, 18 key competencies and 80 enabling competencies:

Figure 1

Diagram of the Delphi rounds.

Obtain permission and include the acknowledgement required by the copyright holder if a figure is being reproduced from another source.

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- SupplementTable3.Overviewofresultsfromthedelphiroundsandoverallconsensusforeachroundacrossdomainsand.docx