BMJ Open

BMJ Open is committed to open peer review. As part of this commitment we make the peer review history of every article we publish publicly available.

When an article is published we post the peer reviewers' comments and the authors' responses online. We also post the versions of the paper that were used during peer review. These are the versions that the peer review comments apply to.

The versions of the paper that follow are the versions that were submitted during the peer review process. They are not the versions of record or the final published versions. They should not be cited or distributed as the published version of this manuscript.

BMJ Open is an open access journal and the full, final, typeset and author-corrected version of record of the manuscript is available on our site with no access controls, subscription charges or pay-per-view fees (http://bmjopen.bmj.com).

If you have any questions on BMJ Open's open peer review process please email

info.bmjopen@bmj.com

BMJ Open

Integrated care for older people based on information and communication technology : a scoping review protocol

Journal:	*BMJ Open*
Manuscript ID	bmjopen-2022-061011
Article Type:	Protocol
Date Submitted by the Author:	13-Jan-2022
Complete List of Authors:	Tian, Yutong; Zhengzhou University, School of Nursing and Health Zhang, Yan; Zhengzhou University, School of Nursing and Health Wang, Shanshan; Zhengzhou University, School of Nursing and Health Cheng, Qingyun; Zhengzhou University, School of Nursing and Health Meng, Lixue; Zhengzhou University, School of Nursing and Health
Keywords:	Information technology < BIOTECHNOLOGY & BIOINFORMATICS, Telemedicine < BIOTECHNOLOGY & BIOINFORMATICS, PRIMARY CARE, GERIATRIC MEDICINE, International health services < HEALTH SERVICES ADMINISTRATION & MANAGEMENT

SCHOLARONE™
Manuscripts

Integrated care for older people based on information and communication technology : a scoping review protocol

Tian Yutong, PhD candidate; Zhang Yan, PhD; Wang Shanshan, PhD; Cheng Qingyunm, Master students; Meng Lixue, Master students

School of Nursing and Health, Zhengzhou University

Corresponding author:

Name: Zhang Yan

Postal Address: 101 Science Avenue, High-tech Zone, Zhengzhou City, Henan Province, China

E-mail: zhangyan2010@zzu.edu.cn

Tel: +86 13613804836

Fax numbers: 0371-86565006

ABSTRACT

Introduction: Integrated care is an effective means to cope with the increasingly complex health care needs of the older adults and alleviate the pressure of national pension services. The World Health Organization regards it as a method for future high-quality healthcare, and advocates integrated care based on digital technology. Under the background of the novel coronavirus pandemic, information and communication technology (ICT) has become a facilitators for the successful implementation of integrated care, which provides a platform for information sharing, team communication and resource integration. The scoping review aims to assess the international published evidence on the experience and practice of ICT-based implementation of integrated care for older people.

Methods and analysis: The study followed the research framework developed by Arksey and O'Malley for the scoping review, with each step iterated to ensure comprehensive coverage of the evidence. We will conduct a systematic search of the literature since 1985 from electronic databases, grey literature databases, key

1

organisations and project-funded websites, key journals, reference lists of papers to be included, and use the Joanna Briggs Institute Literature Quality Assessment Tool to assess the quality of the included literature and apply thematic analysis to sort and summarise the content of the included studies.

Ethics and dissemination: A favourable ethics opinion was obtained from the Academic Committee of Zhengzhou University for this scoping review (ZZUIRB2021-155). This study expects to summarize the operation forms, effects, barriers and facilitators of ICT-based implementation of integrated care for older people. We propose to recruit older adults and integrated care service providers in rural primary health care centers to consult, interpret, and discuss the results of our scoping review using a structured process of concept mapping to construct an integrated care model and service pathway for older adults that is appropriate for the Chinese social context.

KEYWORDS

Information and Communication Technology; Integrated Care; Aged

Strengths and limitations of this study

➢ This study will be the first scoping review to provide a comprehensive synthesis of the effectiveness, facilitators, and impediments to the delivery of integrated care services based on information and communication technologies.

➢ This study will search all literature sources, including peer-reviewed articles, gray literature, key organizations and project-funded websites, key journals, and reference lists of papers to be included.

➢ Quality appraisal of the included studies will be performed.

➢ This study will use a concept mapping approach to conduct a scoping synthesis topic consultation to solicit input from a wide range of stakeholders, including older adults, caregivers, and health care professionals.

➢ The review will be restricted to articles published in English and this may limit the comprehensiveness of the findings.

2

BACKGROUND

With the rapid ageing of societies, the global population aged 60 and over is expected to increase from 1 billion in 2019 to approximately 2.1 billion in 2050, and the population aged 80 and over is expected to increase from 143 million in 2019 to 426 million in 2050. Population ageing is accelerating, particularly in developing countries.[1] As the world's largest developing country, China's 7th national census data in 2021 shows that the number of elderly people aged 60 and above reached 264 million and the population aged 65 and above reached 191 million, accounting for 13.5% of the total population.[2] The number of older adults with chronic co-morbidities, disability and dementia has surged, and the demand for and cost of long-term care are rising rapidly, posing a huge challenge to the national healthcare and social welfare supply.[3] However, integrated care is seen as an effective means of responding to the increasingly complex healthcare needs of older adults and relieving pressure on national elderly care services, and has been actively adopted by various countries to improve their elderly care provision systems.[4]

The concept of " integrated care " first emerged in developed European and American countries in the 1970s. Since the 1990s, the World Health Organization (WHO) has proposed integrated care as a future approach to quality medical services and health care, strengthening primary health care, coordinating health and social health based on an integrated model. In August 2020, the " Decade of Healthy Aging (2020 – 2030) " plan approved by the World Health Assembly specially proposed to carry out integrated care.[5] Integrated care refers to the management and provision of services to enable people to obtain continuous health promotion, disease prevention, diagnosis, treatment, disease management, rehabilitation guidance and palliative care throughout their lives, and to coordinate care at different levels and locations within and outside the health sector in order to improve accessibility, sustainability and quality of care.[6] Integrated care involves different levels and responsibilities, and the degree of integration varies greatly depending on national traditional culture, funding types and welfare pathways, and has gradually led to the development of various models of

3

integrated care, all of which are based on the principles of 'person-centered, holistic and multidisciplinary'. They have been shown to reduce the rate of admissions[7] and emergency admissions,[8] improve quality of life and quality of care, and are cost-effective.[9] However, integrated care is a service system involving multiple stakeholders and its implementation is influenced by multiple factors such as environmental factors at the macro level, institutional organisation at the meso level (funding, leadership, service structure and culture), intervention organisation at the meso level (identity, resources and credibility) and micro level (shared values, participation and communication),[10] where lack of physical and human resources, health care providers' communication and coordination barriers, and difficulties in navigating and accessing information systems are common barriers to integrated care implementation.[11-12]

Information and communication technologies (ICT) are various technological tools and resources used to transmit, store, create, share or exchange information, with the advantage of sharing information across professional and organisational boundaries, and have been identified as an important enabler of integrated care and coordinated primary health care.[13-14] The WHO's Integrated Care for Older People (ICOPE) Programme calls for digitally-based integrated care to implement the Decade of Healthy Ageing by enhancing integration, promoting functional capacity and reducing care dependency.[15] WHO has also specially developed ICOPE App and ICOPE Monitor applications to continuously evaluate and monitor the internal ability of the elderly and guide the provision of human-centered care plans.[16] In addition, during the new coronavirus pandemic, digital health services such as telecare and telemonitoring based on ICT are increasing and have developed as an effective means of providing holistic medical care for older people.[17] ICT provides a platform for resource integration, information sharing, team communication, consultation and feedback, and decision support for the practice of integrated care, which enhances the practicability of integrated care. It can reasonably use limited resources to provide timely specialist care,[18] address COVID-19 concerns and social isolation.[19]

Current systematic evaluations of integrated care have focused on patients with

4

chronic diseases such as Parkinson's disease,[20] atrial fibrillation,[21] dementia,[22] and chronic kidney disease[23] to provide a comprehensive overview of integrated care models, costs, and outcomes. However, there are no studies that have reviewed the current status of ICT-based implementation of integrated care for older people, and its effectiveness in practice, barriers and facilitators need to be further explored. This study therefore proposes to fill this gap by synthesising and collecting evidence on ICT-based integrated care for older people using a scoping review approach. This scoping review aims to achieve the following three objectives: (1) to analyse and synthesise existing service models of ICT-enabled integrated care and their effectiveness in practice, (2) to identify potential barriers and facilitators to the implementation of different models, (3) to describe the context of each service model and draw policy opportunities and lessons that can be applied to the Chinese context.

METHODS AND ANALYSIS

This scoping review will follow the framework developed by Arksey and O'Malley[24] and further updated by Levac et al,[25] which consist of the following six steps: (1) identifying the research questions, (2) searching for relevant studies, (3) selecting studies, (4) data extraction, (5) collating, summarising and reporting results, (6) conducting consultation exercises. These steps will be carried out in an iterative manner and we will engage with each stage in a self-referential manner and repeat steps as necessary to ensure that the literature is fully covered. A research team consisting of a nursing specialist (ZY), an evidence-based nursing specialist (WSS), a PhD student (TYT, Reviewer 1) and two Masters students (CQY, Reviewer 2; MLX, Reviewer 3) was assembled to ensure the smooth running of the review process.

We will report the results of the scoping review following the JBI Evidence Synthesis Manual[26] and the PRISMA-ScR checklist.[27] The JBI guidelines provide the methodology and recommendations for the scoping review and the PRISMA-ScR checklist is used to help the research team better understand the relevant terminology, core concepts and key items to be reported for the scoping review. In addition, in order

5

to guide the review process, core concepts were defined as follows:

➢ ' Integrated care ' The definition of "integrated care" is not yet uniform. Kodner and Spreeuwenberg define integrated care as "a coherent set of approaches and models on the financial, administrative, organisational, service delivery and clinical levels designed to create connectivity, alignment and collaboration within and between cure and care sectors".[28] Valentjin et al.[29] define integrated care as "a network of multiple professionals and organisations across health and social care systems that provide accessible and comprehensive services to people in the community". WHO defines integrated care as "a continuum services of health promotion, disease prevention, diagnosis, treatment, disease management, rehabilitation and palliative care throughout the life course through the management and delivery of services, coordinated between different levels and locations of care within and outside the health sector".[6]

We analysed the above definition of integrated care and proposed the core elements of the concept as follows: (1) a coordinated network across different levels and locations of the health, care and social service systems, (2) the formation of multidisciplinary teams to provide services across the life course of disease prevention, treatment, rehabilitation and palliative care, (3) the provision of coordinated, continuum of care centred on older people.

➢ ' ICT ' refers to the various technological tools and resources used to collect, store, retrieve, create, share or transmit information, including computers, the Internet (websites and email), live broadcast technology (television and radio), recorded broadcast technology (audio and video players as well as storage devices) and telephony (fixed or mobile, visual/video conferencing, etc.)".[30] We will conduct research selection and data extraction based on Twelve relevant ICT tools for integrated care support defined by Maider Mateo-Abad et al,[31] including electronic prescription, messaging clinician and patients, electronic health record, interconsultation, call center, virtual conference, personal health folder, nurse information system, educational platform, collaborative platform, telemonitoring

6

and multichannel centre.

Step 1: identifying the research questions

The main aim of this scoping review is to summarise the available evidence on service content, practice pathways, implementation effectiveness, facilitators and barriers to the implementation of integrated care based on information and communication technologies. In order to connect the research aims and research questions, we formulated a broad research question to guide the subsequent research selection and data extraction. The overarching question that guides this review is "What are the operational models of ICT-based integrated care for older people that have been documented in the published and grey literature?" . After an initial search of the PubMed database and reading of literature related to the research topic, the researcher generated a list of potential sub-questions, which were then discussed by the research team, with team members suggesting changes based on their own experiences, and following the PCC (population, concept, context) principles to further refine the research questions around the research objects,[32] concepts and contexts as follows：

① What is the health status of the older people served? What are the service provision agencies and personnel included?

② What are the information and communication technologies used and what are their functions?

③ What are the contents of the integrated care services provided based on ICT, and how effective are the forms of operation and practice?

④ What are the barriers and facilitators for ICT-based practice of integrated care?

⑤ What lessons can the ICT-based model of integrated care for older people offer for the Chinese context?

We will be guided by the above research questions to establish an effective search strategy and select research parameters, and further refine the research questions based on the content of the retrieved literature during the process of data extraction, collection and summarisation. By answering the above questions, this study proposes to construct

7

an ICT-based integrated care model and practice programme suitable for the Chinese social context, and to explore its operational effectiveness among rural elderly people with disabilities.

Step 2: identifying the relevant studies

In this step, we will develop a search strategy, including time span, terms/concepts, search sources, language, etc., while ensuring the comprehensiveness of the coverage of the evidence and the feasibility of the scoping synthesis. We will conduct a systematic search of papers since 1 January 1985 and is tentatively proposed to be completed by May 2022. The literature search will be conducted using a combination of main headings and entry terms, including "Information and Communication Technology", "Delivery of Health Care, Integrated" and "Aged". The specific terms/ keywords are shown in Table 1. We will continue to refine the search terms as the review progresses in order to perform a more sensitive literature search. Sources for literature searches include electronic databases, grey literature databases, websites of key organisations and project funding, key journals, and reference lists to be included in papers. Given the multidisciplinary nature of the research project, we propose to search PubMed, Web of Science, EBSCO, Scopus, MEDLINE, EMBASE, PscyINFO, CINAHL, Cochrane Library, a total of 11 databases. A draft search strategy for the PubMed database can be found in the online supplementary material. We will search for published and grey literature at: Joanna Briggs, ProQuest Dissertations and Thesis, google scholar. We will also search the websites of key organisations such as World Health Organisation, International Foundation for Integrated Care, European Commission, National Health Service, and integrated care projects such as Beyond Solid, CARE WELL, Smartcare, CONNECARE and INTEGRATE. Team members will identify other websites and sources based on the search during the review process. In addition, three specialist journals, the International Journal of General Nursing, Journal of Integrated Care and International Journal of Care Coordination, will be systematically searched to ensure the comprehensiveness of the searched literature.

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

We will follow the three-step search strategy of Joanna Briggs Institute (JBI) for systematic searching. First, we propose to conduct an initial limited search of the three major databases, PubMed, Web of Science and EBSCO, to further revise the search terms and index terms used to describe the articles. A full search will then be conducted using all identified search terms and index terms, supplemented by a manual search of the reference lists of the proposed review papers. The literature retrieved from each database will be imported into the EndNote X9 literature management software separately after the search is completed, and the search time for each database is recorded. A preliminary check is performed by the researcher based on three major literature information: author, year, and title, and duplicate literature is removed.

Table 1   Search terms/Keywords

Main Headings	Entry Terms
Information Technology	information and communication technology, ICT, digital, tele*, internet, mobile, cloud, *health
Delivery of Health Care, Integrated	integrated care, integrated health system(s), coordinated care, comprehensive care, seamless care, transmural care, multidisciplinary care， holistic care，

9

	joint care,	
	person- centred care	
Aged	old people,	
	senior citizen,	
	elderly,	
	elder,	
	geriatric	

Step 3: study selection

The research team will meet and discuss to develop inclusion and exclusion criteria for the studies, screen papers based on the titles and abstracts of the retrieved literature, and review the full text to select studies.

Inclusion criteria

➢ The intervention/target/service population is older people aged 60 and above.

➢ Describe and/or evaluate ICT-based models of integrated care, where the research must meet the definitions of integrated care and ICT as described above.

➢ Suitable for use in any type of health care setting, including primary health care, hospitals, emergency departments, etc.

➢ Quantitative (intervention research, descriptive research, interpretation-prediction-correlation research), qualitative (phenomenology, grounded theory, content analysis) and mixed-method research designs will be adopted.

➢ The language of the paper is English.

Exclusion criteria

➢ Study of non-human subjects.

➢ Reviews, editorials and descriptive articles that do not provide relevant empirical evidence.

➢ Documents that are duplicated, not available in full text or have incomplete information.

10

Prior to the formal literature selection process, three reviewers are trained in a uniform manner by an evidence-based nursing expert (WSS) to understand and select articles based on the above criteria. Twenty-five papers will be randomly selected from the retrieved literature, and two reviewers (TYT and CQY) independently read the titles/abstracts for initial screening based on inclusion criteria and definitions. The research team meet to discuss the screening discrepancies and to make changes to the inclusion criteria. Formal literature screening and coding began when the consistency between the two reviewers reach 75%, and papers are categorised as ' eligible, non-eligible ' according to their level of compliance with the inclusion criteria. Reviewers organise meetings at the beginning, middle and end of the initial literature screening process to discuss findings, progress, challenges and uncertainties related to study selection, and to return and refine the search strategy as necessary. Two reviewers will then independently search and review the full text of all literature coded as 'eligible' to be considered for inclusion in the study. If two reviewers do not agree on the inclusion of the study, a third reviewer (MLX) will be consulted or discussed by the study team for a final decision. In addition, as the aim of this scoping review is to provide guidance on the construction and implementation of intelligence integrated care programmes, we propose to use the appropriate JBI literature quality evaluation tool to evaluate the quality of the included final studies. A study selection flowchart and a literature quality evaluation report form will be finalised.

Step 4: charting the data

The research team identifie the variables to be extracted based on the research questions and the principles of person-centred, comprehensive and multidisciplinary nature of integrated care, and work together to develop the data extraction checklist, which is shown in Table 2. Two researchers (TYT and CQY) independently process data from 5 to 10 pieces of literature using a data extraction form, and then conduct a research team meeting where team members double-check the extracted data, evaluate the consistency of the information extracted by the 2 researchers and the strength of the

11

interpretation of the research questions in the included literature, and further revise the data extraction checklist. The researchers will use an iterative approach to extract data from the included studies and continually update and refine the list format and content to further clarify the practice approaches, barriers and facilitators of ICT-based integrated care for older people.

Table 2   Data extraction form

Country (where the project is implemented)
Author
Year
Publication name
Study Title
Study design characteristics
Research questions / Objectives
Participant characteristics / Sample size (if applicable)
Model practice approach (model name, target group, integration agency, multidisciplinary team members, service content, ICT, service process, initial results) (if applicable)
Model practice evaluation (hindrances, facilitators) (if applicable)

Step 5: collating, summarizing and reporting of the results

According to the design types of the included studies, we will use quantitative (descriptive statistical analysis, frequency) and qualitative (descriptive content analysis) methods to analyze the underlying values of the scope, nature and distribution of the reviewed studies. Two researchers (TYT and CQY) follow Braun and Clarke's thematic analysis method to sort out and summarise the content of the included studies in the following process.

①Researchers record their understanding of the literature during repeated readings.

② Researchers extract valid information from the literature and mark it with coloured pens to form a coding set.

12

③ Consolidation of code sets into potential themes by placing all codes within potential themes.

④ Review the full text and check whether the extracted codes and code sets are relevant to the potential themes, forming a map of the relationships between the potential themes.

⑤ Revisit the potential theme from the perspective of the full text and describe it in a short sentence, formally naming it and identifying the existence of sub-themes.

⑥ Report the results of the analysis, which should be concise and coherent, logical, and cite incorporated literature in support.

The entire analysis process is not linear and can be iterative between two adjacent steps, depending on the researcher's level of understanding of the literature, to achieve optimal results in condensing the themes. We will use Nvivo software for data coding and analysis. Additional, we will also use charts or tables to depict the findings and provide an overview of the concepts, theoretical underpinnings and types of evidence relevant to the topic of this scoping review, to culminate in a model framework that will guide ICT-based practice in integrating care.

Step 6: Consultation

This stage is intended to gain insights and opinions beyond the literature by consulting the stakeholders involved in this study, but it is optional. To highlight the person-centred service principles of integrated care, a group of older people and service providers in a rural primary care centre will be recruited to consult on the preliminary findings and brainstorm their views on the ICT-based model of integrated care delivery. We will then follow the structured conceptualization process of concept mapping, and conduct a multidimensional scaling analysis and hierarchical clustering analysis of the consultation results to further revise the formed model framework.[33] In addition, in order to facilitate the wider dissemination of research knowledge, we will construct service protocols that incorporate the results of the scoping review and facilitate their

application in rural health primary care, guided by the model framework.

Patient and public involvement

Patients and the public were not involved in the development of this protocol.

DISCUSSION

This scoping review aims to review the service components, operational effectiveness, barriers and facilitators of ICT-based implementation of an integrated care model for older people in order to increase the knowledge of this service model among researchers, healthcare providers and policy makers. Our next step will be to recruit older people and integrated care service providers in rural primary health care centres, consult their views on the use of ICT to implement integrated care, and use a concept mapping approach based on a structured conceptualization process of preparing, generating statements (brainstorming and scoping the results of thematic analysis), structuring statements, representing statements, and explaining concept maps, to construct a model framework and practice protocol for ICT-based implementation of integrated care for older people and to facilitate its application in rural health primary care. This study aims to alleviate the current situation of weakened family care functions, lack of quality medical resources and mismatch between supply and demand of elderly care services in rural areas, in order to meet the diverse and complex needs of the elderly, as well as to provide recommendations for policy makers and practitioners.

ETHICS AND DISSEMINATION

This study has obtained ethical review from the Academic Committee of Zhengzhou University (ZZUIRB2021-155) The results of the scoping review will be published in peer-reviewed journals and shared at academic conferences and public forums for researchers to understand the type of evidence published in the field of ICT-based implementation of integrated care for older people and to judge the value of conducting a systematic review. In addition, the findings of this scoping review will be

14

disseminated with older people and stakeholders involved in the delivery of integrated care services in primary health care settings to inform and guide the next phase of building an ICT-based integrated care intervention programme.

Acknowledgements

References

1 WH Organization. Ageing and health. In, 2021.
2 SS Bureau. Seventh National Population Census. In, 2021.

15

3 Zhang Linagwen, F Ya. Prediction of Contribution Rate of Long-term Care Insurance for the Aged in China based on the Balance of Supply and Demand. *Chinese Journal of Health Statistics* 2021;38(03):340-43.

4 W Xiandong. Research on the "Integrated Care" for elderly in Britain and Its Implications for China--Based on the Perspective of Complex Adaptive System Theory. Anhui university of finance & economics, 2020.

5 WH Organization. Ageing and Health Unit. In, 2021.

6 WH Organization. Integrated care for older people (ICOPE) implementation framework: guidance for systems and services. In, 2019.

7 SR de Bruin, J Billings, A Stoop, et al. Different Contexts, Similar Challenges. SUSTAIN's Experiences with Improving Integrated Care in Europe. *Int J Integr Care* 2020;20(2):17.

8 M Morciano, K Checkland, J Billings, et al. New integrated care models in England associated with small reduction in hospital admissions in longer-term: A difference-in-differences analysis. *Health Policy* 2020;124(8):826-33.

9 L Vestjens, JM Cramm, E Birnie, AP Nieboer. Cost-effectiveness of a proactive, integrated primary care approach for community-dwelling frail older persons. *Cost Effect Resour a* 2019;17(1).

10 DE Threapleton, RY Chung, S Wong, et al. Integrated care for older populations and its implementation facilitators and barriers: A rapid scoping review. *Int J Qual Health Care* 2017;29(3):327-34.

11 A Marshall, K Rawlings, S Zaluski, P Gonzalez, G Harvey. What do older people want from integrated care? Experiences from a South Australian co-design case study. *Australas J Ageing* 2021.

12 E Sadler, V Potterton, R Anderson, et al. Service user, carer and provider perspectives on integrated care for older people with frailty, and factors perceived to facilitate and hinder implementation: A systematic review and narrative synthesis. *Plos One* 2019;14(5):e216488.

13 A Ahmed, M van den Muijsenbergh, JC Mewes, WP Wodchis, H Vrijhoef. Untangling the inter-relatedness within integrated care programmes for community-dwelling frail older people: a rapid realist review. *Bmj Open* 2021;11(4):e43280.

14 O Prajankett, A Markaki. Integrated older people care and advanced practice nursing: an evidence-based review. *Int Nurs Rev* 2021;68(1):67-77.

15 G Berntsen, F Strisland, K Malm-Nicolaisen, et al. The Evidence Base for an Ideal Care Pathway for Frail Multimorbid Elderly: Combined Scoping and Systematic Intervention Review. *J Med Internet Res* 2019;21(4):e12517.

16 D Sanchez-Rodriguez, S Piccard, N Dardenne, et al. Implementation of the Integrated Care of Older People (ICOPE) App and ICOPE Monitor in Primary Care: A study protocol. *J Frailty Aging* 2021;10(3):290-96.

17 S Doraiswamy, A Abraham, R Mamtani, S Cheema. Use of Telehealth During the COVID-19 Pandemic: Scoping Review. *J Med Internet Res* 2020;22(12):e24087.

18 J Tönnies, M Hartmann, M Wensing, et al. Mental Health Specialist Video Consultations Versus Treatment-as-Usual for Patients With Depression or Anxiety Disorders in Primary Care: Randomized Controlled Feasibility Trial. *JMIR Ment Health* 2021;8(3):e22569.

19 R Weiskittle, W Tsang, A Schwabenbauer, N Andrew, M Mlinac. Feasibility of a COVID-19 Rapid Response Telehealth Group Addressing Older Adult Worry and Social Isolation. *Clin Gerontol* 2021:1-15.

16

20 R Rajan, L Brennan, BR Bloem, et al. Integrated Care in Parkinson's Disease: A Systematic Review and Meta‑Analysis. *Movement Disord* 2020;35(9):1509-31.

21 C Gallagher, AD Elliott, CX Wong, et al. Integrated care in atrial fibrillation: a systematic review and meta-analysis. *Heart* 2017:2016-310952.

22 DO Sullivan, M Mannix, S Timmons. Integrated Care Pathways and Care Bundles for Dementia in Acute Care: Concept Versus Evidence. *Am J Alzheimers Dis Other Demen* 2017;32(4):189-93.

23 PP Valentijn, FA Pereira, M Ruospo, et al. Person-Centered Integrated Care for Chronic Kidney Disease: A Systematic Review and Meta-Analysis of Randomized Controlled Trials. *Clin J Am Soc Nephrol* 2018;13(3):375-86.

24 H Arksey, L O'Malley. Scoping studies: towards a methodological framework. *Int J Soc Res Method* 2005;8(1):19-32.

25 D Levac, H Colquhoun, KK O'Brien. Scoping studies: advancing the methodology. *Implementation science : IS* 2010;5(1):69.

26 GCMP Peters MDJ, editor *JBI Manual for Evidence Synthesis, Chapter 11: Scoping Reviews (2020 version)*. JBI: JBI, 2020.

27 AC Tricco, E Lillie, W Zarin, et al. PRISMA Extension for Scoping Reviews (PRISMA-ScR): Checklist and Explanation. *Ann Intern Med* 2018;169(7):467-73.

28 DL Kodner, C Spreeuwenberg. Integrated care: meaning, logic, applications, and implications--a discussion paper. *Int J Integr Care* 2002;2:e12.

29 PP Valentijn, SM Schepman, W Opheij, MA Bruijnzeels. Understanding integrated care: a comprehensive conceptual framework based on the integrative functions of primary care. *Int J Integr Care* 2013;13:e10.

30 UIF Statistics. Guide to measuring information and communication technologies (ICT) in education. In, 2020.

31 M Mateo-Abad, A Fullaondo, M Merino, et al. Impact Assessment of an Innovative Integrated Care Model for Older Complex Patients with Multimorbidity: The CareWell Project. *Int J Integr Care* 2020;20(2):8.

32 C Lockwood, KB Dos Santos, R Pap. Practical Guidance for Knowledge Synthesis: Scoping Review Methods. *Asian Nurs Res* 2019;13(5):287-94.

33 WM Trochim, D McLinden. Introduction to a special issue on concept mapping. *Eval Program Plann* 2017;60:166-75.

17

Draft Search Strategy for PubMed Database

Keywords / Terms

Main Headings	Entry Terms
Information Technology	information and communication technology,
	ICT,
	digital,
	tele*,
	internet,
	mobile,
	cloud,
	eHealth
Delivery of Health Care, Integrated	integrated care,
	integrated health system(s),
	coordinated care,
	comprehensive care,
	seamless care,
	transmural care,
	multidisciplinary care，
	holistic care，
	joint care,
	person- centred care
Aged	old people,
	senior citizen,
	elderly,
	elder,
	geriatric

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

Search Strategy：

(((((((((((Information Technology[MeSH Terms]) OR (information[Title/Abstract] AND communication technology[Title/Abstract])) OR (ICT[Title/Abstract])) OR (digital[Title/Abstract])) OR (tele*[Title/Abstract])) OR (internet[Title/Abstract])) OR (mobile[Title/Abstract])) OR (cloud[Title/Abstract])) OR (eHealth[Title/Abstract])) AND (((((((((((Delivery of Health Care, Integrated[MeSH Terms]) OR (integrated care[Title/Abstract])) OR (integrated health system[Title/Abstract])) OR (coordinated care[Title/Abstract])) OR (comprehensive care[Title/Abstract])) OR (seamless care[Title/Abstract])) OR (transmural care[Title/Abstract])) OR (multidisciplinary care[Title/Abstract])) OR (holistic care[Title/Abstract])) OR (joint care[Title/Abstract])) OR (person- centred care[Title/Abstract]))) AND (((((((Aged[MeSH Terms]) OR (old people[Title/Abstract])) OR (senior citizen[Title/Abstract])) OR (elderly[Title/Abstract])) OR (elder[Title/Abstract])) OR (geriatric[Title/Abstract]))

Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) Checklist

SECTION	ITEM	PRISMA-ScR CHECKLIST ITEM	REPORTED ON PAGE #
TITLE			
Title	1	Identify the report as a scoping review.	1
ABSTRACT			
Structured summary	2	Provide a structured summary that includes (as applicable): background, objectives, eligibility criteria, sources of evidence, charting methods, results, and conclusions that relate to the review questions and objectives.	1
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of what is already known. Explain why the review questions/objectives lend themselves to a scoping review approach.	2-4
Objectives	4	Provide an explicit statement of the questions and objectives being addressed with reference to their key elements (e.g., population or participants, concepts, and context) or other relevant key elements used to conceptualize the review questions and/or objectives.	5
METHODS			
Protocol and registration	5	Indicate whether a review protocol exists; state if and where it can be accessed (e.g., a Web address); and if available, provide registration information, including the registration number.	5-13
Eligibility criteria	6	Specify characteristics of the sources of evidence used as eligibility criteria (e.g., years considered, language, and publication status), and provide a rationale.	8
Information sources*	7	Describe all information sources in the search (e.g., databases with dates of coverage and contact with authors to identify additional sources), as well as the date the most recent search was executed.	8
Search	8	Present the full electronic search strategy for at least 1 database, including any limits used, such that it could be repeated.	Supplemental Material
Selection of sources of evidence†	9	State the process for selecting sources of evidence (i.e., screening and eligibility) included in the scoping review.	10-12
Data charting process‡	10	Describe the methods of charting data from the included sources of evidence (e.g., calibrated forms or forms that have been tested by the team before their use, and whether data charting was done independently or in duplicate) and any processes for obtaining and confirming data from investigators.	11-12
Data items	11	List and define all variables for which data were sought and any assumptions and simplifications made.	12
Critical appraisal of individual sources of evidence§	12	If done, provide a rationale for conducting a critical appraisal of included sources of evidence; describe the methods used and how this information was used in any data synthesis (if appropriate).	12-13

SECTION	ITEM	PRISMA-ScR CHECKLIST ITEM	REPORTED ON PAGE #
Synthesis of results	13	Describe the methods of handling and summarizing the data that were charted.	12-13
RESULTS			
Selection of sources of evidence	14	Give numbers of sources of evidence screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally using a flow diagram.	None
Characteristics of sources of evidence	15	For each source of evidence, present characteristics for which data were charted and provide the citations.	None
Critical appraisal within sources of evidence	16	If done, present data on critical appraisal of included sources of evidence (see item 12).	None
Results of individual sources of evidence	17	For each included source of evidence, present the relevant data that were charted that relate to the review questions and objectives.	None
Synthesis of results	18	Summarize and/or present the charting results as they relate to the review questions and objectives.	None
DISCUSSION			
Summary of evidence	19	Summarize the main results (including an overview of concepts, themes, and types of evidence available), link to the review questions and objectives, and consider the relevance to key groups.	None
Limitations	20	Discuss the limitations of the scoping review process.	None
Conclusions	21	Provide a general interpretation of the results with respect to the review questions and objectives, as well as potential implications and/or next steps.	None
FUNDING			
Funding	22	Describe sources of funding for the included sources of evidence, as well as sources of funding for the scoping review. Describe the role of the funders of the scoping review.	15

JBI = Joanna Briggs Institute; PRISMA-ScR = Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews.

* Where *sources of evidence* (see second footnote) are compiled from, such as bibliographic databases, social media platforms, and Web sites.

† A more inclusive/heterogeneous term used to account for the different types of evidence or data sources (e.g., quantitative and/or qualitative research, expert opinion, and policy documents) that may be eligible in a scoping review as opposed to only studies. This is not to be confused with *information sources* (see first footnote).

‡ The frameworks by Arksey and O'Malley (6) and Levac and colleagues (7) and the JBI guidance (4, 5) refer to the process of data extraction in a scoping review as data charting.

§ The process of systematically examining research evidence to assess its validity, results, and relevance before using it to inform a decision. This term is used for items 12 and 19 instead of "risk of bias" (which is more applicable to systematic reviews of interventions) to include and acknowledge the various sources of evidence that may be used in a scoping review (e.g., quantitative and/or qualitative research, expert opinion, and policy document).

From: Tricco AC, Lillie E, Zarin W, O'Brien KK, Colquhoun H, Levac D, et al. PRISMA Extension for Scoping Reviews (PRISMAScR): Checklist and Explanation. Ann Intern Med. 2018;169:467–473. doi: 10.7326/M18-0850.

St. Michael's
Inspired Care.
Inspiring Science.

BMJ Open

Integrated care for older people based on information and communication technology : a scoping review protocol

Journal:	*BMJ Open*
Manuscript ID	bmjopen-2022-061011.R1
Article Type:	Protocol
Date Submitted by the Author:	20-Mar-2022
Complete List of Authors:	Tian, Yutong; Zhengzhou University, School of Nursing and Health Zhang, Yan; Zhengzhou University, School of Nursing and Health Wang, Shanshan; Zhengzhou University, School of Nursing and Health; The Hong Kong Polytechnic University, School of Nursing Cheng, Qingyun; Zhengzhou University, School of Nursing and Health Meng, Lixue; Zhengzhou University, School of Nursing and Health
Primary Subject Heading:	Nursing
Secondary Subject Heading:	Public health, Health informatics, Global health, Patient-centred medicine
Keywords:	Information technology < BIOTECHNOLOGY & BIOINFORMATICS, Telemedicine < BIOTECHNOLOGY & BIOINFORMATICS, PRIMARY CARE, GERIATRIC MEDICINE, International health services < HEALTH SERVICES ADMINISTRATION & MANAGEMENT

SCHOLARONE™
Manuscripts

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

1 **Integrated care for older people based on information and**

2 **communication technology: A scoping review protocol**

3 Tian Yutong,[1] PhD candidate; Zhang Yan,[1] PhD; Wang Shanshan,[1] [2] PhD; Cheng

4 Qingyun,[1] Master students; Meng Lixue,[1] Master students

5 [1] School of Nursing and Health, Zhengzhou University, Henan Province, China

6 [2] School of Nursing, The Hong Kong Polytechnic University, Hong Kong, China

7 **Corresponding author:**

8 Name: Zhang Yan

9 Postal Address: 101 Science Avenue, High-tech Zone, Zhengzhou City, Henan

10 Province, China

11 E-mail: zhangyan2010@zzu.edu.cn

12 Tel: +86 13613804836

13 Fax numbers: 0371-86565006

14

15 **ABSTRACT**

16 **Introduction**: Integrated care is an effective means of coping with the increasingly

17 complex healthcare needs of elderly and alleviating pressure on national pension

18 services. World Health Organization regards integrated care as a method of providing

19 high-quality healthcare and advocates integrated care based on digital technology.

20 Against the backdrop of the COVID-19 pandemic, information and communication

21 technology (ICT) has become a facilitator for the successful implementation of

22 integrated care by providing a platform for information sharing, team communication

23 and resource integration. This scoping review aims to assess internationally published

24 evidence concerning experiences and practice of ICT-based implementation of

25 integrated care for older people.

26 **Methods and analysis:** The study will follow the research framework developed by

27 Arksey and O'Malley for scoping reviews. We will conduct a systematic search of the

28 literature published from January 2000 to March 2022 via electronic databases, grey

1

1　literature databases, websites of key organisations and project funding sources, key

2　journals, and reference lists included in selected papers, employ the Joanna Briggs

3　Institute Literature Quality Assessment Tool to assess the quality of the included

4　literature and apply thematic analysis to sort and summarise the content of the included

5　studies. This study will begin in March 2022 and will be completed in December 2022.

6　**Ethics and dissemination**: Ethical approval for this scoping review was granted by the

7　Academic Committee of Zhengzhou University (ZZUIRB2021-155). This study will

8　summarise the modes of operation and effects, barriers and facilitators of ICT-based

9　implementation of integrated care for older people. We propose to recruit older people

10　and integrated care service providers in rural primary healthcare centres and use a

11　structured process of concept mapping to consult and discuss the results of our scoping

12　review to construct an integrated care model and service pathway for older adults that

13　is appropriate to the Chinese social context.

14　**KEYWORDS**

15　Information and Communication Technology; Integrated Care; Aged People

16　**Strengths and limitations of this study**

17　➢　This study will be the first scoping review to provide a comprehensive synthesis of

18　　the effects, facilitators, and challenges involved in the delivery of integrated care

19　　services based on information and communication technologies.

20　➢　This study will search all literature sources, including peer-reviewed articles, grey

21　　literature, websites of key organisations and project funding sources, key journals,

22　　and reference lists included in selected papers.

23　➢　Quality appraisal of the included studies will be performed.

24　➢　This study will use a concept mapping approach to conduct a scoping synthesis

25　　topic consultation to solicit input from a wide range of stakeholders, including

26　　older adults, caregivers, and health care professionals.

27　➢　The review will be restricted to articles published in English, which may limit the

28　　comprehensiveness of the findings.

2

BACKGROUND

Giving the rapid ageing of societies, the global population of individuals aged 60 and older is expected to increase from 1 billion in 2019 to approximately 2.1 billion in 2050, and the population of individuals aged 80 and over is expected to increase from 143 million in 2019 to 426 million in 2050. Population ageing is accelerating, particularly in developing countries.[1] As the world's largest developing country, China's 7th national census data from 2021 show that the number of elderly people aged 60 and above had reached 264 million and that the population aged 65 and above had reached 191 million, accounting for 13.5% of the total population.[2] The number of older adults with chronic comorbidities, disability and dementia has increased dramatically, and the demand for and cost of long-term care have also risen rapidly, posing a tremendous challenge to the national supply of health care and social welfare services.[3] However, integrated care is seen as an effective means of responding to the increasingly complex health care needs of older adults and enhancing primary health care.[4] Primary health care is a whole-of-society approach to health that aims to achieve universal health coverage and sustainability by providing comprehensive and integrated health services throughout the individual's life course (promotion, prevention, treatment, rehabilitation, palliation), encouraging intersectoral evidence-based policies and actions, and empowering individuals, families and communities to act at all three levels.[5]

The concept of "integrated care" first emerged in developed European and American countries in the 1970s. Since the 1990s, the World Health Organization (WHO) has proposed integrated care as an approach to quality medical services and health care for the future, which can strengthen primary health care and coordinate health and social health based on an integrated model. In August 2020, the "Decade of Healthy Aging (2020–2030)" plan approved by the World Health Assembly specifically proposed a focus on integrated care.[6] Integrated care refers to the management and provision of services to provide people with continuous health promotion, disease prevention, diagnosis, treatment, disease management, rehabilitation guidance and palliative care throughout their lives and to coordinate care

3

1 at different levels and locations both within and outside the health sector to improve

2 accessibility, sustainability and quality of care.[7] Integrated care involves different levels

3 and responsibilities, and the degree of integration varies greatly depending on the

4 traditional culture, funding types and welfare pathways of the nation involved, this

5 situation has gradually led to the development of various models of integrated care, all

6 of which are based on the principles of 'person-centred, holistic and multidisciplinary'

7 care, in which multidisciplinary teams of physicians, nurses, health care workers such

8 as rehabilitation workers, social workers, and caregivers are organized, with each

9 discipline providing multidisciplinary care to address the specific needs of patients, or

10 team members further reaching group decisions/consensus to provide interdisciplinary

11 care. The initial practice of integrated care services/models has shown their ability to

12 reduce nursing home[8] and emergency admissions,[9] to improve quality of life and quality

13 of care and to be cost-effective.[10] However, integrated care is a service system involving

14 multiple stakeholders, and its implementation is influenced by multiple factors, such as

15 environmental factors at the macro level, institutional organisation at the meso level

16 (funding, leadership, service structure and culture), intervention organisation at the

17 meso level (identity, resources and credibility) and the micro level (shared values,

18 participation and communication),[11] where lack of physical and human resources,

19 health care providers' communication and coordination barriers, and difficulties in

20 navigating and accessing information systems are common barriers to integrated care

21 implementation.[12-13]

22   Information and communication technologies (ICT) refer to various technological

23 tools and resources used to transmit, store, create, share or exchange information, with

24 the advantage of allowing information to be shared across professional and

25 organisational boundaries and have been identified as an important enabler of integrated

26 care and coordinated primary health care.[14-15] The WHO's Integrated Care for Older

27 People (ICOPE) programme calls for digitally based integrated care to facilitate the

28 Decade of Healthy Aging by enhancing integration, promoting functional capacity and

29 reducing care dependency.[16] The WHO has also particularly developed the ICOPE App

4

1   and ICOPE Monitor applications to continuously evaluate and monitor the internal

2   ability of elderly individuals and serve as guidelines for human-centred care plans.[17] In

3   addition, during the recent coronavirus pandemic, the use of digital health services such

4   as telecare and telemonitoring based on ICT has increased and have developed into an

5   effective means of providing holistic medical care to older people.[18] ICT provides a

6   platform for resource integration, information sharing, team communication,

7   consultation and feedback, and decision support for the practice of integrated care,

8   which enhances the practicability of integrated care. ICT can facilitate the reasonable

9   use of limited resources to provide timely specialist care[19] and can address concerns

10   related to COVID-19 and social isolation.[20]

11   Current systematic evaluations of integrated care have focused on patients with

12   chronic diseases such as Parkinson's disease,[21] atrial fibrillation,[22] dementia,[23] and

13   chronic kidney disease[24] to provide a comprehensive overview of integrated care

14   models, costs, and effects. However, no studies have reviewed the current status of ICT-

15   based implementation of integrated care for older people, and the models, barriers and

16   facilitators related to such practice require further exploration. This study therefore

17   proposes to fill this gap by synthesising and collecting evidence pertaining to ICT-based

18   integrated care for older people using a scoping review approach. This scoping review

19   aims to achieve the following three objectives: (1) to analyse and synthesise existing

20   service models of ICT-enabled integrated care, (2) to identify potential barriers to and

21   facilitators of ICT-based implementation of integrated care models, and (3) to describe

22   the context of each service model and suggest policy opportunities and lessons that can

23   be applied to the Chinese context.

METHODS AND ANALYSIS

25   This scoping review will follow the framework developed by Arksey and

26   O'Malley[25] and further updated by Levac et al.,[26] which consists of the following six

27   steps: (1) identifying the research questions, (2) searching for relevant studies, (3)

28   selecting studies, (4) data extraction, (5) collating, summarising and reporting results,

29   and (6) conducting consultation exercises. These steps will be iterated, and we will

5

1 engage with each stage in a self-referential manner and repeat steps as necessary to

2 ensure that the literature is fully covered. A research team consisting of a nursing

3 specialist (ZY), an evidence-based nursing specialist (WSS), a PhD student (TYT,

4 Reviewer 1) and two master's students (CQY, Reviewer 2; MLX, Reviewer 3) has been

5 assembled to ensure the smooth running of the review process. The research team has

6 sufficient time, human and financial resources to conduct this study. All three reviewers

7 (TYT, CQY, MLX) are full-time graduate students who have been systematically

8 taught evidence-based nursing methods, such as database searching, literature

9 screening and quality evaluation, and they have a full understanding of what integrated

10 care entails. In addition, two nursing experts (ZY, WSS) can provide guidance in terms

11 of methodology and study reports, and the research team has obtained full access to the

12 databases to be searched in this study. The team has also established partnerships with

13 several primary health care centres located in rural that can serve as a channel for

14 selecting patients and service providers to participate in this study.

15 We will report the results of the scoping review following the JBI Evidence

16 Synthesis Manual[27] and the PRISMA-ScR checklist.[28] The JBI guidelines indicate the

17 methodology and recommendations for the scoping review, and the PRISMA-ScR

18 checklist can be used to help the research team better understand the relevant

19 terminology, core concepts and key items to be reported in the scoping review. In

20 addition, to guide the review process, core concepts are defined as follows:

21 ➢ ' Integrated care' The definition of "integrated care" has not yet been standardised.

22 Kodner and Spreeuwenberg define integrated care as "a coherent set of approaches

23 and models on the financial, administrative, organisational, service delivery and

24 clinical levels designed to create connectivity, alignment and collaboration within

25 and between cure and care sectors".[29] Valentjin et al.[30] define integrated care as "a

26 network of multiple professionals and organisations across health and social care

27 systems that provide accessible and comprehensive services to people in the

28 community". The WHO defines integrated care as "a continuum services of health

29 promotion, disease prevention, diagnosis, treatment, disease management,

6

1 rehabilitation and palliative care throughout the life course through the

2 management and delivery of services, coordinated between different levels and

3 locations of care within and outside the health sector".[7]

4 Combining this definitional analysis and the key principles of integrated care, we

5 propose the following core elements of the concept: (1) attention to problems and

6 (care) needs in different domains of life, such as physical, cognitive, psychological,

7 social and/or environmental needs; (2) involvement of health care and social care

8 personnel from multiple disciplines and/or sectors in the form of interdisciplinary

9 teams aimed at providing a continuum of disease prevention, treatment,

10 rehabilitation, and/or palliative treatment across the life course; and (3) active

11 participation by older people and their informal carers in decision-making and

12 planning for the care process centred on their abilities, needs and/or preferences.

13 ➢ 'ICT' refers to the various technological tools and resources used to collect, store,

14 retrieve, create, share or transmit information, including computers, the internet

15 (websites and email), live broadcast technology (television and radio), recorded

16 broadcast technology (audio and video players as well as storage devices) and

17 telephony (fixed or mobile telephones, visual/video conferencing, etc.)".[31] We will

18 conduct research selection and data extraction based on twelve relevant ICT tools

19 for integrated care support as defined by Maider Mateo-Abad et al.,[32] including

20 electronic prescriptions, messaging between clinicians and patients, electronic

21 health records, interconsultation, call centres, virtual conferences, personal health

22 folders, nurse information systems, educational platforms, collaborative platforms,

23 telemonitoring and multichannel centres.

24 **Step 1: Identifying the research questions**

25 The main aim of this scoping review is to summarise the available evidence

26 concerning the service content, practice pathways, implementation effects, facilitators

27 and barriers involved in the implementation of integrated care based on ICT. To connect

28 these research aims with our research questions, we formulated a broad research

29 question to guide the subsequent research selection and data extraction. The

7

1   overarching question that guides this review is as follows: "What are the operational

2   models of ICT-based integrated care for older people that have been documented in the

3   published and grey literature?" After an initial search of the PubMed database and

4   assessment of the literature related to the research topic, the reviewer generated a list

5   of potential subquestions, which were then discussed by the research team, with team

6   members suggesting changes based on their own experiences and following the PCC

7   (population, concept, context) principles to further refine the research questions

8   pertaining to research objects,[33] concepts and contexts as follows:

9   ①What is the health status of the older people in question? What service provision

10   agencies and personnel are included?

11   ②What information and communication technologies are used, and what are their

12   functions?

13   ③What are the components of ICT-based integrated care services? What are the

14   relevant operational forms and practical effects?

15   ④What are the barriers to and facilitators of ICT-based practice of integrated care?

16   ⑤What lessons can the ICT-based model of integrated care for older people offer

17   in the Chinese context?

18   We will be guided by the above research questions to establish an effective search

19   strategy and select research parameters and to further refine our research questions

20   based on the content of the literature retrieved during the process of data extraction,

21   collection and summarisation. By answering the questions listed above, this study

22   proposes to construct an ICT-based integrated care model and practice programme that

23   is suitable for the Chinese social context and to explore its operational effects among

24   elderly people with disabilities in rural areas.

25   **Step 2: Identifying the relevant studies**

26   In this step, we will develop a search strategy, including an appropriate time span,

27   terms/concepts, search sources, and language for the search, while also ensuring the

28   comprehensiveness of the coverage of the evidence and the feasibility of the scoping

29   synthesis. We will conduct a systematic search of papers published from January 2000

8

1234567...60

1   to March 2022, with a preliminary intention to complete the search by the end of April

2   2022. The literature search will be conducted using a combination of main headings

3   and entry terms, including "Information and Communication Technology", "Delivery

4   of Health Care, Integrated" and "Aged". The specific terms/keywords that will be used

5   are shown in Table 1. An initial search was performed in the PubMed database, and a

6   detailed search strategy is described in the supplementary material. We will continue to

7   refine our search terms as the review progresses to perform a more sensitive literature

8   search. Sources for literature searches included electronic databases, grey literature

9   databases, websites of key organisations and project funding sources, key journals, and

10   reference lists included in selected papers. Given the multidisciplinary nature of this

11   research project, we propose to search PubMed, Web of Science, EBSCO, Scopus,

12   MEDLINE, EMBASE, PscyINFO, CINAHL, and the Cochrane Library, i.e., a total of

13   nine databases. A draft search strategy for the PubMed database can be found in the

14   online supplementary material. We will search for published and grey literature at

15   Joanna Briggs, ProQuest Dissertations and Thesis, Google Scholar. We will also search

16   the websites of key organisations such as the World Health Organization, the

17   International Foundation for Integrated Care, the European Commission, and the

18   National Health Service as well as those of integrated care projects such as Beyond

19   Solid, CARE WELL, Smartcare, CONNECARE and INTEGRATE. Team members

20   will identify other websites and sources based on the search during the review process.

21   In addition, three specialist journals, the International Journal of General Nursing, the

22   Journal of Integrated Care and the International Journal of Care Coordination, will be

23   systematically searched to ensure the comprehensiveness of the surveyed literature.

24   We will follow the three-step search strategy proposed by the Joanna Briggs

25   Institute (JBI) for systematic searches. First, we propose to conduct an initial, limited

26   search of the three major databases, PubMed, Web of Science and EBSCO, to further

27   revise the search and index terms used to describe the articles. A full search will then

28   be conducted using all identified search terms and index terms, supplemented by a

29   manual search of the reference lists of the proposed review papers. The literature

9

1 retrieved from each database will be imported into EndNote X9 literature management

2 software separately after the search is completed, and the search time for each database

3 will be recorded. A preliminary check will be performed by the reviewer based on three

4 major pieces of literature information (author, year, and title), and duplicate literature

5 will be removed.

6 **Table 1 Search terms/Keywords**

Main Headings	Entry Terms
Information Technology	information and communication technology,
	ICT,
	digital,
	tele*,
	internet,
	mobile,
	cloud,
	eHealth
	virtual care
Delivery of Health Care, Integrated	integrated care,
	integrated health system(s),
	coordinated care,
	comprehensive care,
	seamless care,
	transmural care,
	multidisciplinary care，
	holistic care，
	joint care,
	person- centred care
	interprofessional care
	team-based care

10

Aged	old people,
	senior citizen,
	elderly,
	elder,
	geriatric

1   **Step 3: Study selection**

2   The research team will meet and discuss the inclusion and exclusion criteria for

3   studies, screen papers based on the titles and abstracts of the retrieved literature, and

4   review the full text to select studies.

5   Inclusion criteria

6   ➢   The intervention/target/service population is older people aged 60 and above.

7   ➢   The study describes and/or evaluates ICT-based models of integrated care, in

8   which context the research must meet the definitions of integrated care and

9   ICT as described above.

10 ➢   The literature is suitable for use in any type of health care setting, including

11   primary health care, hospitals, and emergency departments.

12 ➢   Quantitative (intervention research, descriptive research, interpretation-

13   prediction-correlation research), qualitative (phenomenology, grounded

14   theory, content analysis) or mixed-method research designs are used.

15 ➢   The language of the paper is English.

16 Exclusion criteria

17 ➢   Study of nonhuman subjects.

18 ➢   Reviews, editorials and descriptive articles that do not provide relevant

19   empirical evidence.

20 ➢   Literature featuring no access to the full text or incomplete information.

21 Prior to the formal literature selection process, three reviewers (TYT, CQY, MLX)

22 will be trained in an identical manner by an evidence-based nursing expert (WSS) to

23 select articles based on the above criteria. Twenty-five papers will be randomly selected

24 from the retrieved literature, and two reviewers (TYT, CQY) will independently read

11

1 the titles/abstracts for initial screening based on inclusion criteria and definitions. The

2 research team will meet to discuss screening discrepancies and to revise the inclusion

3 criteria. Formal literature screening and coding will begin when the consistency

4 between the two reviewers (TYT, CQY) reached 75%, and papers will be categorised

5 as 'eligible/ineligible' according to their level of compliance with the inclusion criteria.

6 Reviewers will organise meetings at the beginning, middle and end of the initial

7 literature screening process to discuss findings, progress, challenges and uncertainties

8 related to study selection and to return to and refine the search strategy as necessary.

9 Two reviewers (TYT, CQY) then will independently search and review the full text of

10 all literature coded as 'eligible' to evaluate these texts for inclusion in the study. If two

11 reviewers (TYT, CQY) don't agree on the inclusion of the study, a third reviewer (MLX)

12 will be consulted by the study team for a final decision. In addition, as the aim of this

13 scoping review is to provide guidance concerning the construction and implementation

14 of intelligence integrated care programmes, we propose the use of the appropriate JBI

15 literature quality evaluation tool to evaluate the quality of the studies that are ultimately

16 included. A study selection flowchart and a literature quality evaluation report form

17 will be finalised.

18 **Step 4: Charting the data**

19   The research team will identify the variables to be extracted based on the research

20 questions and the principles of person-centred, comprehensive and multidisciplinary

21 nature of integrated care and work together to develop the data extraction checklist,

22 which is shown in Table 2. Two reviewers (TYT, CQY) will independently process

23 data from 5 to 10 pieces of literature using a data extraction form and then conduct a

24 research team meeting in which team members will double-check the extracted data,

25 evaluate the consistency of the information extracted by the two reviewers and the

26 strength of the interpretation of the research questions in the included literature, and

27 further revise the data extraction checklist. The reviewers will use an iterative approach

28 to extract data from the included studies and will continually update and refine the list

29 format and content to further clarify the approaches to practice, barriers and facilitators

1 involved in ICT-based integrated care for older people.

2 **Table 2 Data extraction form**

Country (where the project is implemented)

Author

Year

Publication name

Study Title

Study design characteristics

Research questions/objectives

Participant characteristics/sample size (if applicable)

Model practice approach (model name, target group, integration agency, multidisciplinary team members, service content, ICT, service process) (if applicable)

Model practice evaluation (initial effects, hindrances, facilitators) (if applicable)

3 **Step 5: Collating, summarising and reporting the results**

4 In accordance with the design types of the included studies, we will use both

5 quantitative (descriptive statistical analysis, frequency) and qualitative (descriptive

6 content analysis) methods to analyse the underlying values of the scope, nature and

7 distribution of the reviewed studies. Two reviewers (TYT, CQY) will follow the

8 approach to thematic analysis developed by Braun and Clarke to sort out and summarise

9 the content of the included studies via the following process.

10 ① Reviewers record their understanding of the literature as developed through

11 repeated readings.

12 ② Reviewers extract valid information from the literature and mark it with

13 coloured pens to form a coding set.

14 ③ Reviewers consolidate coding sets into potential themes by locating all codes

15 within potential themes.

16 ④ Reviewers review the full text and determine whether the extracted codes and

17 coding sets are relevant to potential themes, forming a map of the relationships

13

1 among potential themes.

2 ⑤ Reviewers revisit potential themes in the context of the full text and describe it

3 in a short sentence, formally naming it and identifying the existence of

4 subthemes.

5 ⑥Reviewers report the results of the analysis, which should be concise, coherent,

6 and logical and should cite relevant supporting literature.

7 The entire process of analysis is not linear and can iterate between two adjacent

8 steps in accordance with the reviewer's level of understanding of the literature to

9 achieve optimal results with respect to condensing the themes. We will use NVivo

10 software for data coding and analysis. Additionally, we will also use charts or tables to

11 depict our findings and provide an overview of the concepts, theoretical underpinnings

12 and types of evidence relevant to the topic of this scoping review, culminating in a

13 model framework that can guide ICT-based practice in the context of integrating care.

14 **Step 6: Consultation**

15 This stage is intended to provide insights and opinions ranging beyond the

16 literature by consulting the stakeholders involved in this study. However, this process

17 is optional. To highlight the person-centred service principles of integrated care, a

18 group of older people and service providers in a rural primary care centre will be

19 recruited to consult on the preliminary findings and to brainstorm regarding the ICT-

20 based model of integrated care delivery. We will then follow the structured

21 conceptualisation process of concept mapping and conduct a multidimensional scaling

22 analysis and hierarchical clustering analysis of the consultation results to further revise

23 the model framework that will be developed.[34] In addition, to facilitate the wider

24 dissemination of research knowledge, we will construct service protocols that

25 incorporate the results of the scoping review and facilitate their application in the

26 context of primary health care in rural areas, guided by this model framework.

27 **Patient and public involvement**

28 Neither patients nor the public were involved in the development of this protocol.

29 **DISCUSSION**

14

1   This scoping review aims to review the service components, operational effects,

2 barriers and facilitators involved ICT-based implementation of integrated care models

3 for older people, which can further improve the content of integrated care service

4 delivery systems and address the research gap resulting from the lack of systematic

5 reviews targeting this area. In addition, the results of this review will help increase the

6 knowledge of researchers, health care providers, and policy-makers regarding this

7 service model and facilitate the implementation of ICT-based integrated care services

8 for older adults and thus permit them to effectively respond to the global pandemic of

9 novel coronavirus pneumonia.

10   Our next step will be to recruit older people and integrated care service providers

11 in rural primary health care centres, collect their views concerning the use of ICT to

12 implement integrated care, and employ a concept mapping approach based on a

13 structured conceptualisation process of preparing, generating statements (brainstorming

14 and scoping the results of thematic analysis), structuring statements, representing

15 statements, and explaining concept maps in order to construct a model framework and

16 practice protocol for ICT-based implementation of integrated care for older people and

17 to facilitate its application in the context of primary health care in rural areas. This

18 approach will help the individuals involved to alleviate the current situation of poor

19 home care, a lack of quality medical resources, and a mismatch between supply and

20 demand for elderly services in rural areas, thereby meeting the diverse and complex

21 needs of elderly individuals and providing recommendations for policy-makers and

22 practitioners. However, this study will only include literature written in English due to

23 limited language translation resources, and the research team will only be able to

24 retrieve some of the grey literature given limited access to databases and search engines,

25 which may inhibit the comprehensiveness of the literature included in this study to some

26 degree.

27 **ETHICS AND DISSEMINATION**

28   This study obtained ethical approval from the Academic Committee of Zhengzhou

29 University (ZZUIRB2021-155). The results of the scoping review will be published in

15

peer-reviewed journals and shared at academic conferences and public forums for researchers to propagate understanding of the type of evidence published in the context of ICT-based implementation of integrated care for older people and to ascertain the value of conducting a systematic review. In addition, the findings of this scoping review will be disseminated among older people and stakeholders who are involved in the delivery of integrated care services in primary health care settings to inform and guide the next phase of developing an ICT-based integrated care intervention programme.

16

1 licenses/ by/ 4. 0/

References

1 World Health Organization. Ageing and health[online]. 2021. https://www.who.int/news-room/fact-sheets/detail/ageing-and-health

2 National Bureau of Statistics. Seventh National Population Census[online]. China: National Bureau of Statistics, 2021. http://www.stats.gov.cn/ztjc/zdtjgz/zgrkpc/dqcrkpc/ggl/202105/t20210519_1817693.html

3 Zhang Linagwen, F Ya. Prediction of Contribution Rate of Long-term Care Insurance for the Aged in China based on the Balance of Supply and Demand. *Chinese Journal of Health Statistics* 2021;38(03):340-343+347.

4 W Xiandong. Research on the "Integrated Care" for elderly in Britain and Its Implications for China--Based on the Perspective of Complex Adaptive System Theory. Anhui university of finance & economics, 2020.

5 World Health Organization. Primary health care measurement framework and indicators[online]. 2019. https://apps.who.int/gb/ebwha/pdf_files/WHA72/A72_12-en.pdf

6 World Health Organization. Ageing and Health Unit[online]. 2021. https://www.who.int/teams/maternal- newborn-child-adolescent-health-and-agein

7 World Health Organization. Integrated care for older people (ICOPE) implementation framework: guidance for systems and services[online]. 2019. https://www.who.int/publications/i/item/9789241515993

8 SR de Bruin, J Billings, A Stoop, et al. Different Contexts, Similar Challenges. SUSTAIN's Experiences with Improving Integrated Care in Europe. *Int J Integr Care* 2020;20(2):17.

9 M Morciano, K Checkland, J Billings, et al. New integrated care models in England associated with small reduction in hospital admissions in longer-term: A difference-in-differences analysis. *Health Policy* 2020;124(8):826-833.

10 L Vestjens, JM Cramm, E Birnie, et al. Cost-effectiveness of a proactive, integrated primary care approach for community-dwelling frail older persons. *Cost Effect Resour a* 2019;17(1):14.

11 DE Threapleton, RY Chung, S Wong, et al. Integrated care for older populations and its implementation facilitators and barriers: A rapid scoping review. *Int J Qual Health Care*

17

1   2017;29(3):327-334.

2   12 A Marshall, K Rawlings, S Zaluski, et al. What do older people want from integrated care?

3   Experiences from a South Australian   co-design case study. *Australas J Ageing* 2021;

4   40(4):406-412.

5   13 E Sadler, V Potterton, R Anderson, et al. Service user, carer and provider perspectives on

6   integrated care for older people   with frailty, and factors perceived to facilitate and hinder

7   implementation: A   systematic review and narrative synthesis. *Plos One* 2019;14(5):e216488.

8   14 A Ahmed, M van den Muijsenbergh, JC Mewes, et al. Untangling the inter-relatedness within

9   integrated care programmes for   community-dwelling frail older people: a rapid realist review.

10   *Bmj Open* 2021;11(4):e43280.

11 15 O Prajankett, A Markaki. Integrated older people care and advanced practice nursing: an

12   evidence-based   review. *Int Nurs Rev* 2021;68(1):67-77.

13 16 G Berntsen, F Strisland, K Malm-Nicolaisen, et al. The Evidence Base for an Ideal Care Pathway

14   for Frail Multimorbid Elderly: Combined   Scoping and Systematic Intervention Review. *J Med*

15   *Internet Res* 2019;21(4):e12517.

16 17 D Sanchez-Rodriguez, S Piccard, N Dardenne, et al. Implementation of the Integrated Care of

17   Older People (ICOPE) App and ICOPE Monitor   in Primary Care: A study protocol. *J Frailty*

18   *Aging* 2021;10(3):290-296.

19 18 S Doraiswamy, A Abraham, R Mamtani, et al. Use of Telehealth During the COVID-19

20   Pandemic: Scoping Review. *J Med Internet Res* 2020;22(12):e24087.

21 19 J Tönnies, M Hartmann, M Wensing, et al. Mental Health Specialist Video Consultations Versus

22   Treatment-as-Usual for Patients   With Depression or Anxiety Disorders in Primary Care:

23   Randomized Controlled   Feasibility Trial. *JMIR Ment Health* 2021;8(3):e22569.

24 20 R Weiskittle, W Tsang, A Schwabenbauer, et al. Feasibility of a COVID-19 Rapid Response

25   Telehealth Group Addressing Older Adult   Worry and Social Isolation. *Clin Gerontol*

26   2022;45(1):129-143.

27 21 R Rajan, L Brennan, BR Bloem, et al. Integrated Care in Parkinson's Disease: A Systematic

28   Review andMeta‐Analysis. *Movement Disord* 2020;35(9):1509-1531.

29 22 C Gallagher, AD Elliott, CX Wong, et al. Integrated care in atrial fibrillation: a systematic review

30   and meta-analysis. *Heart* 2017;103(24):1947-1953.

18

1   23 DO Sullivan, M Mannix, S Timmons. Integrated Care Pathways and Care Bundles for Dementia
2   in Acute Care: Concept Versus Evidence. *Am J Alzheimers Dis Other Demen* 2017;32(4):189-
3   193.

4   24 PP Valentijn, FA Pereira, M Ruospo, et al. Person-Centered Integrated Care for Chronic Kidney
5   Disease: A Systematic Review and Meta-Analysis of Randomized Controlled Trials. *Clin J Am*
6   *Soc Nephrol* 2018;13(3):375-386.

7   25 H Arksey, L O'Malley. Scoping studies: towards a methodological framework. *Int J Soc Res*
8   *Method* 2005;8(1):19-32.

9   26 D Levac, H Colquhoun, KK O'Brien. Scoping studies: advancing the methodology.
10   *Implementation science : IS* 2010;5(1):69.

11 27 Peters MDJ, Godfrey C, McInerney P, editor *JBI Manual for Evidence Synthesis, Chapter 11:*
12   *Scoping Reviews (2020 version)*. JBI: JBI, 2020.

13 28 AC Tricco, E Lillie, W Zarin, et al. PRISMA Extension for Scoping Reviews (PRISMA-ScR):
14   Checklist and Explanation. *Ann Intern Med* 2018;169(7):467-473.

15 29 DL Kodner, C Spreeuwenberg. Integrated care: meaning, logic, applications, and implications--
16   a discussion paper. *Int J Integr Care* 2002;2:e12.

17 30 PP Valentijn, SM Schepman, W Opheij, et al. Understanding integrated care: a comprehensive
18   conceptual framework based on the   integrative functions of primary care. *Int J Integr Care*
19   2013;13:e10.

20 31 UNESCO Institute for Statistics. Guide to measuring information and communication
21   technologies   (ICT)   in   education[online].   2020.
22   http://uis.unesco.org/sites/default/files/documents/guide-to-measuring-information-and-
23   communication-technologies-ict-in-education-en_0.pdf.

24 32 M Mateo-Abad, A Fullaondo, M Merino, et al. Impact Assessment of an Innovative Integrated
25   Care Model for Older Complex Patients   with Multimorbidity: The CareWell Project. *Int J*
26   *Integr Care* 2020;20(2):8.

27 33 C Lockwood, KB Dos Santos, R Pap. Practical Guidance for Knowledge Synthesis: Scoping
28   Review Methods. *Asian Nurs Res* 2019;13(5):287-294.

29 34 WM Trochim, D McLinden. Introduction to a special issue on concept mapping. *Eval Program*
30   *Plann* 2017;60:166-175.

19

Initial Search Results for PubMed Database

Keywords / Terms

Main Headings	Entry Terms
Information Technology	information and communication technology,
	ICT,
	digital,
	tele*,
	internet,
	mobile,
	cloud,
	eHealth
	virtual care
Delivery of Health Care, Integrated	integrated care,
	integrated health system(s),
	coordinated care,
	comprehensive care,
	seamless care,
	transmural care,
	multidisciplinary care,
	holistic care,
	joint care,
	person- centred care
	interprofessional care
	team-based care
Aged	old people,
	senior citizen,
	elderly,
	elder,
	geriatric

Search Strategy：

(((((((((((Information Technology[MeSH Terms]) OR (information and communication technology[Title/Abstract])) OR (ICT[Title/Abstract])) OR (digital[Title/Abstract])) OR (tele*[Title/Abstract])) OR (internet[Title/Abstract])) OR (mobile[Title/Abstract])) OR (cloud[Title/Abstract])) OR (eHealth[Title/Abstract])) OR (virtual care[Title/Abstract])) AND (((((((Aged[MeSH Terms]) OR (old people[Title/Abstract])) OR (senior citizen[Title/Abstract])) OR (elderly[Title/Abstract])) OR (elder[Title/Abstract])) OR (geriatric[Title/Abstract]))) AND ((((((((((((Delivery of Health Care, Integrated[MeSH Terms]) OR (integrated care[Title/Abstract])) OR (integrated health system(s[Title/Abstract]))) OR (coordinated care[Title/Abstract])) OR (comprehensive care[Title/Abstract])) OR (seamless care[Title/Abstract])) OR (transmural care[Title/Abstract])) OR (multidisciplinary care[Title/Abstract])) OR (holistic care[Title/Abstract])) OR (joint care[Title/Abstract])) OR (person- centred care[Title/Abstract])) OR (interprofessional care[Title/Abstract])) OR (team-based care[Title/Abstract]))

Initial Search Results

We conducted an initial search in the PubMed database using the search strategy described above and retrieved a total of 603 publications.

Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) Checklist

SECTION	ITEM	PRISMA-ScR CHECKLIST ITEM	REPORTED ON PAGE #
TITLE			
Title	1	Identify the report as a scoping review.	1
ABSTRACT			
Structured summary	2	Provide a structured summary that includes (as applicable): background, objectives, eligibility criteria, sources of evidence, charting methods, results, and conclusions that relate to the review questions and objectives.	1-2
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of what is already known. Explain why the review questions/objectives lend themselves to a scoping review approach.	3-5
Objectives	4	Provide an explicit statement of the questions and objectives being addressed with reference to their key elements (e.g., population or participants, concepts, and context) or other relevant key elements used to conceptualize the review questions and/or objectives.	5
METHODS			
Protocol and registration	5	Indicate whether a review protocol exists; state if and where it can be accessed (e.g., a Web address); and if available, provide registration information, including the registration number.	5-14
Eligibility criteria	6	Specify characteristics of the sources of evidence used as eligibility criteria (e.g., years considered, language, and publication status), and provide a rationale.	11
Information sources*	7	Describe all information sources in the search (e.g., databases with dates of coverage and contact with authors to identify additional sources), as well as the date the most recent search was executed.	9
Search	8	Present the full electronic search strategy for at least 1 database, including any limits used, such that it could be repeated.	Supplemental Material
Selection of sources of evidence†	9	State the process for selecting sources of evidence (i.e., screening and eligibility) included in the scoping review.	11-13
Data charting process‡	10	Describe the methods of charting data from the included sources of evidence (e.g., calibrated forms or forms that have been tested by the team before their use, and whether data charting was done independently or in duplicate) and any processes for obtaining and confirming data from investigators.	12-13
Data items	11	List and define all variables for which data were sought and any assumptions and simplifications made.	13
Critical appraisal of individual sources of evidence§	12	If done, provide a rationale for conducting a critical appraisal of included sources of evidence; describe the methods used and how this information was used in any data synthesis (if appropriate).	13-14

St. Michael's
Inspired Care.
Inspiring Science.

1

SECTION	ITEM	PRISMA-ScR CHECKLIST ITEM	REPORTED ON PAGE #
Synthesis of results	13	Describe the methods of handling and summarizing the data that were charted.	13-14
RESULTS			
Selection of sources of evidence	14	Give numbers of sources of evidence screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally using a flow diagram.	None
Characteristics of sources of evidence	15	For each source of evidence, present characteristics for which data were charted and provide the citations.	None
Critical appraisal within sources of evidence	16	If done, present data on critical appraisal of included sources of evidence (see item 12).	None
Results of individual sources of evidence	17	For each included source of evidence, present the relevant data that were charted that relate to the review questions and objectives.	None
Synthesis of results	18	Summarize and/or present the charting results as they relate to the review questions and objectives.	None
DISCUSSION			
Summary of evidence	19	Summarize the main results (including an overview of concepts, themes, and types of evidence available), link to the review questions and objectives, and consider the relevance to key groups.	None
Limitations	20	Discuss the limitations of the scoping review process.	None
Conclusions	21	Provide a general interpretation of the results with respect to the review questions and objectives, as well as potential implications and/or next steps.	None
FUNDING			
Funding	22	Describe sources of funding for the included sources of evidence, as well as sources of funding for the scoping review. Describe the role of the funders of the scoping review.	16

JBI = Joanna Briggs Institute; PRISMA-ScR = Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews.
* Where *sources of evidence* (see second footnote) are compiled from, such as bibliographic databases, social media platforms, and Web sites.
† A more inclusive/heterogeneous term used to account for the different types of evidence or data sources (e.g., quantitative and/or qualitative research, expert opinion, and policy documents) that may be eligible in a scoping review as opposed to only studies. This is not to be confused with *information sources* (see first footnote).
‡ The frameworks by Arksey and O'Malley (6) and Levac and colleagues (7) and the JBI guidance (4, 5) refer to the process of data extraction in a scoping review as data charting*.
§ The process of systematically examining research evidence to assess its validity, results, and relevance before using it to inform a decision. This term is used for items 12 and 19 instead of "risk of bias" (which is more applicable to systematic reviews of interventions) to include and acknowledge the various sources of evidence that may be used in a scoping review (e.g., quantitative and/or qualitative research, expert opinion, and policy document).

From: Tricco AC, Lillie E, Zarin W, O'Brien KK, Colquhoun H, Levac D, et al. PRISMA Extension for Scoping Reviews (PRISMAScR): Checklist and Explanation. Ann Intern Med. 2018;169:467–473. doi: 10.7326/M18-0850.

St. Michael's
Inspired Care.
Inspiring Science.