

Measuring the impact of continuity of care/integrated care on health quality outcome indicators: a review of the available international evidence

Misurare gli impatti della continuità/integrazione assistenziale sugli indicatori di qualità: una revisione delle evidenze internazionali

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SUMMARY

Introduction: an integrated, continuous, and coordinated healthcare represents one of the milestones to guarantee high quality health systems. This is even more true considering the increase in the prevalence of chronic diseases that require a collaboration among health professional and settings.

The World Health Organization defines integrated care as “the management and delivery of health services such that people receive a continuum of health promotion, health protection and disease prevention services, as well as diagnosis, treatment, long-term care, rehabilitation, and palliative care services through the different levels and sites of care within the health system and according to their needs.”

As a matter of fact, several models have been adopted to make integrated care possible, but the evaluation of their impact on the quality of health systems and on outcome indicators is worthy.

Objectives: the aim of this work was to provide an overview of indicators used to assess the quality of (integrated) care with particular attention to outcome indicators and to make an overview of the evidence on the impact of models to implement integrated care on them.

Methods: a narrative review was carried out on PubMed to identify systematic reviews that assessed the impact of integrated care on outcomes indicators. Furthermore, institutional websites were consulted to look for information on quality indicators in general.

Results: several indicators have been proposed to assess the quality of care even though those aimed to assess integrated care could be further implemented. As far as the literature is concerned, nine reviews published between 2012 and 2020 were considered. They mostly considered patients reported experience measures, clinical outcomes, health services use and medication. Integrated care was shown to reduce hospital admission/readmission and to increase patients' satisfaction and medication management across considered studies. On the contrary, results on clinical outcomes and perceived quality of care were more inconsistent.

Conclusions: albeit the plenty of literature on the topic and the positive effects shown in regard to some indicators, there is room for improvement in term of both completeness and robustness of the analysis of the impact of integrated care on outcome indicators.

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RIASSUNTO

Introduzione: un'assistenza sanitaria quanto più integrata, coordinata e continua, rappresenta uno dei pilastri di un sistema sanitario di qualità. Questo concetto è tanto più vero se pensiamo all'aumento esponenziale di patologie croniche che necessitano di un'attenzione continua e di un'imprescindibile collaborazione tra professionisti sanitari e vari livelli assistenziali. L'Organizzazione Mondiale della Sanità definisce l'assistenza integrata come "la gestione e l'erogazione di prestazioni sanitarie in modo tale che le persone ricevano un continuum di servizi, di promozione della salute, di prevenzione delle malattie, nonché diagnosi, trattamento, assistenza a lungo termine, riabilitazione, e servizi di cure palliative attraverso i vari livelli e siti di cura, all'interno del sistema sanitario e secondo le loro esigenze".

Diversi modelli sono stati adottati per implementare la continuità e l'integrazione dell'assistenza, ma valutare il loro impatto sulla qualità delle cure e, in particolare, sugli indicatori di outcome è essenziale.

Obiettivi: lo scopo di questo lavoro è stato fornire da una parte una panoramica degli indicatori di qualità utilizzati per valutare l'assistenza sanitaria e l'integrazione e la continuità delle cure, con particolare riguardo agli indicatori di outcome e, dall'altra, raccogliere e sintetizzare le evidenze circa l'impatto di modelli integrati di assistenza sugli indicatori.

Metodi: è stata effettuata una revisione narrativa su PubMed delle revisioni sistematiche di letteratura che hanno analizzato l'impatto dell'implementazione di modelli di integrazione/continuità delle cure sugli indicatori di outcome. Inoltre, sono stati consultati siti istituzionali per la raccolta di informazioni circa gli indicatori utilizzati per la valutazione della qualità dell'assistenza.

Risultati: diversi sono gli indicatori suggeriti a livello internazionale per valutare la qualità dell'assistenza, sebbene l'ambito dell'integrazione e della continuità delle cure si presti sicuramente ad ulteriori approfondimenti. Per quanto riguarda la letteratura disponibile, sono state selezionate nove revisioni sistematiche pubblicate tra il 2012 e il 2020 che hanno prevalentemente valutato l'utilizzo dell'ospedale, outcome clinici, ma anche misure riportate dai pazienti e l'impatto sulla gestione terapeutica. Quello che emerge è una coerenza di fondo dei risultati circa l'incremento della soddisfazione da parte dei pazienti e dell'appropriatezza terapeutica, così come una riduzione delle ammissioni/riammissioni in ospedale. Meno solidi invece risultano i risultati sugli indicatori di outcome clinico e di qualità percepita.

Conclusioni: benché la letteratura sull'impatto dell'integrazione e della continuità delle cure sugli indicatori di outcome sia consistente e dimostri risultati positivi, permangono ancora delle aree di incertezza che meriterebbero di ulteriori sviluppi metodologici e di ricerca.

Introduction

The concept of continuity of care first appeared in the literature in mid-20th century and has then evolved in its meaning. It gradually incorporated several concepts, such as integration, coordination, multidimensionality (1).

Currently, continuity of care refers to how an individual's health care is connected over time (2).

Continuity of care is often of little immediate interest to young healthy people with minor health problems. However, it is extremely important for people with more serious or chronic health problems, and this is why it has been paid growing attention.

In fact, the need to ensure continuity of care has largely been driven by the significant increase in the number of patients with chronic diseases and multimorbidity and the inevitably sharp increase in costs associated with their management. For these patients, there is general agreement that continuity of care matters across all of its three core dimensions - informational, management, and relationship continuity (3). Informational continuity refers to the use of recorded information by clinicians who care for the patient. Relationship continuity refers to the knowledge of patients' preferences and interpersonal trust. Management continuity is linked to the shared management of care plans and protocols and allows providing both patients and providers with a sense of predictability and security in future care (3).

Indeed, promoting continuity of care includes sharing patients' medical information amongst providers and building trust between patients and healthcare professionals. It also involves ensuring that the patient has safe, coordinated transition among different healthcare levels, services, and providers.

Effective healthcare organisation has to embody all the aspects of continuity in order to allow a patient-centered high quality care over time (4). There are two important perspectives on this. In fact, patients look to continuity of care as a 'continuous caring relationship' with a healthcare professional. On the contrary, from the healthcare professionals' point of view, continuity of care calls for integration, coordination and sharing of information between different providers (5).

Several models have been developed to implement continuity of care and thus meeting patients' satisfaction of both the relationship/informational aspects and the management of care and ultimately improving patients' health outcomes (5). Relevant to get all these goals is to promote integrated care. The World Health Organization (WHO) describes integrated care as: "the management and delivery of health services such that people receive a continuum of health promotion, health protection and disease prevention services, as well as diagnosis, treatment, long-term care, rehabilitation, and palliative care services through the different levels and sites of care within the health system and according to their needs" (6). Indeed, integrated care matters organization and coordination of services and care delivery (7).

Integration of care has been put in place in different ways throughout the years, encompassing multidisciplinary care in the 1960s, partnership working in the 1970s, and shared care and disease management in the 1980s and 1990s (7). In the 2000s other models were adopted to combine primary, secondary, community and adult social care services, namely care trusts, managed clinical networks, accountable care organizations and local clinical partnerships (7).

Integrated care is expected to improve population's and patients' health, patients' experiences, and efficiency (8), thus contributing to better quality of care. Nevertheless,

indicators should be taken into consideration in order to evaluate it. In this respect, output indicators can be useful to evaluate the process of continuity/integration of care across different levels considering several attributes, such as information flow and sharing, care coherence, appropriateness, completeness, and accessibility (9).

Alongside output indicators, also outcome indicators should be considered to have a more thorough and patient-centred evaluation of models and approaches for continuity of/integrated care.

This article would like to provide first an overview of outcome indicators used to assess the quality of care and then an overview of available systematic reviews on the impact on outcome indicators of models and approaches adopted to provide patients with continuity of/integrated care.

Methods

International and national institution websites were consulted to collect documents on health outcome indicators as a whole and provide the readers with an overview of their use in evaluating the quality of care. Then a narrative review was performed on PubMed in January 2021 to look for systematic reviews addressing the impact of continuity of/integrated care on outcome indicators. The following free text terms were used for the search: “continuity of care”, “integrated care”, impact. Citations were reviewed according to titles and abstracts first and then on the basis of the full text. Articles were included in the final overview if they were published in English and reported the results of systematic reviews that addressed the impact of the application of continuity of care/integrated care models on outcome indicators. Articles focused only on the impact on economic indicators were excluded as well as those addressing narrow/specific groups of the population (i.e., mothers) or diseases/type of care (i.e., palliative care). The following data were extracted from each included systematic review: databases used for the search, number, and time range of included papers, study population, study models for continuity of/integrated care, study outcomes (indicators), main results. Results were summarized in a narrative way.

Results

1. Outcome indicators for the evaluation of the quality of care

The identification of indicators that can be used to measure the quality of care is of utmost importance as indicators are meant as reproducible and accurate tools to measure phenomena and provide support to health decisions and quality improvement interventions. According to Lalonde report, human biology, health care systems, environment, and lifestyle should be recognized as major components of health (10).

Indeed, the European Community Health Indicators (ECHI) list differentiated indi-

cators according to their main category, namely health status, determinants of health, health interventions/health services, socioeconomic and demographic factors, and health promotion (11).

Indicators belonging to health status as well as health interventions/health services can be useful to address the quality of care, even though a broader perspective is deserved to thoroughly assess it.

In fact, the quality of care is represented by the ability of health services to get desired health outcomes, consistently with current knowledge (12). This definition calls the attention on health services as a whole, including both primary and secondary care services. Unfortunately, there is not a definite agreement on indicators for quality of care but there are important supranational initiatives that have tried to develop and measure indicators for evaluating health care quality.

The Organization for Economic Cooperation and Development (OECD) Health Care Quality and Outcomes programme, previous known as Health Care Quality Indicators (HCQI) Project, was started in 2001. The project identified a set of 61 indicators to evaluate quality of care belonging to seven areas: primary care, acute care, mental health, patient experiences, prescribing in primary care, patient safety, cancer care (13).

The Agency for Healthcare Research and Quality also developed quality indicators to measure health care quality using available data. These indicators encompass (14):

- Prevention Quality Indicators (PQI), namely population-based indicators that help identifying issues regarding outpatient care, including follow-up care and potential preventable complication.
- Inpatient Quality Indicators (IQIs) that provide a viewpoint on the quality of care inside hospitals, including inpatient mortality and the use of procedures for which there are concerns of overuse, underuse, and misuse.
- Patient Safety Indicators (PSIs) that provide information on possibly avoidable safety events that represent room for improvement in the delivery of care (i.e., in-hospital complications and conflicting events following surgeries, procedures, and childbirth).
- Paediatric Quality Indicators (PDIs) that focus on potentially avoidable complications and iatrogenic events for paediatric patients treated in hospitals and their avoidable hospitalizations.

As far as the assessment of continuity of care is concerned, the Assessing Care of Vulnerable Elders (ACOVE) project conducted by RAND Health in collaboration to Pfizer issued a specific set of indicators focused on general components of continuity and coordination of care that allows evaluating information continuity and coordination across and within providers, and continuity and coordination between care

settings (15). These indicators are indeed mostly process/output indicators. Actually, outcome indicators, including patient-reported outcome measures (PROM) and patient-reported experience measures (PREM) should be also taken into consideration to evaluate continuity of /integrated care.

1. The impact of continuity of /integrated care on outcome indicators

Out of an original number of 108 systematic reviews found on PubMed, 9 were eventually included (Table 1) (16-24). They were published from 2012 to 2020 and addressed adult patients with different health conditions. The study by Liljas et al. (17) dealt only with older adults. Two studies (22, 23) specifically evaluated the improvement in medication management following the adoption of continuity of care approaches in respect to patients admitted/discharged to/from hospital or on high-risk/high pill burden medication. Medication discrepancies were reduced, and medication appropriateness improved with a positive impact also on patients' satisfaction and hospital readmission. Nonetheless, inconclusive results were reported with respect to medical error identification and reduction and medication adherence. Four studies mainly focused on integration and collaboration among different health and social care professionals (17-19, 24). Their findings suggests an increase in patients' satisfaction and adherence to recommended practices and a positive impact on hospital admission/readmission, length of stay, access to services. On the other hand, results on patient-assessed quality of care seems controversial. The study by Rocks (16) also focused on interventions to improve collaboration within and/or between care sectors but collated together empirical economic evaluations and meta-analyzed the effect on health outcomes showing an overall positive impact. One study focused on nurse-based models to improve continuity of care (21) achieving inconclusive results

First author, journal, year	Time range of included papers (number)	Databases used for the search	Type of patients	Models adopted	Type of indicators	Results
Bethishou L, Journal of the American Pharmacist Association, 2020	Bethishou L, Journal of the American Pharmacist Association, 2020	PubMed; Web of Science; Cinahl	Patients admitted for cardiac or pulmonary issues, medicare patients, patients who were on high-risk medications, those with a high pill burden	Different continuity of care approaches: <ul style="list-style-type: none"> • post discharge phone call provided by pharmacist (most common) • face to face visits • transmission of health information to the appropriate follow-up outpatient provider • a combination of them 	Readmission (most common) Medication error identification and reduction Medication adherence Patient satisfaction Medication appropriateness	A significant reduction in readmission was shown from most studies independently by the approach. More controversial results were shown on medical error identification and reduction and medication adherence. Significant increase in patients' satisfaction and medical appropriateness was shown even though few studies addressed them.
Reeves S, Cochrane Database of Systematic review, 2017	From 2007 to 2015 (9 studies)	Central; Medline; Cinahl; ClinicalTrials.gov; WHO International Clinical Trials; Registry Platform	Different types of patients across different levels of the health system	Intervention to improve collaboration amongst two or more types of health or social care professionals (mostly externally facilitated inter-professional activities, followed by interprofessional round, interprofessional meetings, interprofessional checklists)	-Patient health outcomes (mortality, morbidity, disease incidence, disease duration, cure rates, quality of life measures, functional status, complication rate, patient-assessed, quality of care. -Clinical process or efficiency outcomes: readmission rates, adherence to recommended practices, continuity of care, use of healthcare resources participant satisfaction	Results showed a slight improvement in patients' functional status and adherence to recommended practices. It is unclear the role on patient-assessed quality of care and continuity of care.
Baxter S, BMC Health Service Research, 2018	From 2006 to March 2017 (167 studies)	Medline; Embase; PsycINFO; Cinahl; Science and Social science citation indices; Cochrane Library; UK grey literature including the Kings Fund and NHS England	Different types of patients across different levels of the health system (older adults, and populations described as having complex needs mostly represented)	Multi-element model of integrated care aimed to increase integration and/or coordination (case manager/case co-ordinator initiatives more common in the international literature, whereas integrated care pathways/plans more common in the UK)	Extensive range of outcomes grouped into three main areas: <ol style="list-style-type: none"> 1) those relating to usage of health care resources 2) those relating to the quality of care received by patients 3) outcomes for staff working experience 	Increased patients' satisfaction and perceived quality of care (by both staff and patient); increased/improved patient access. Unclear results on reduction in waiting times, out-patient appointments, length of stay, patient contacts/service usage. The evidence on patients described as having "complex needs", suggested a stronger positive outcome in terms of reduced admissions and emergency department use.

Rocks S, The European Journal of Health Economics, 2020	From inception to December 2019 (34 studies)	Cinahl; Dare; Embase; Medline/PubMed; NHS EED; OECD Library; Scopus; Web of Science; WHO-LIS database	Different types of patients	Funding, administrative, organisational, service delivery and clinical interventions designed to create connectivity, alignment, and collaboration within and/or between the cure and care sectors (integrated case management interventions, integrated care teams, coordination between different services, integrated care pathways, integrated care programs based on disease management)	Quality of life Quality adjusted life years, Clinical outcomes, Mortality	Results indicated that integrated care was associated with improved outcomes compared with usual care, especially in studies with a follow-up period over a year. In particular programs based on disease management and integrated care management were associated with positive outcome results.
Spinewine A, International Journal for Quality in Health Care, 2013	From 1 January 1995 to 31 December 2010 (14 studies)	Medline; Embase; Cinahl; Ipa; Cochrane Database of Systematic Reviews	Patients on medication admitted to and/or discharged from hospital	Different approaches to optimize continuity of care in medication management (interventions focus on admission, discharge -communication on discharge information to primary care providers, patient education and counselling -, before discharge -patient education and counselling -, before and after discharge -interventions targeting both patients and primary care providers -)	Medication errors, discrepancies, knowledge, compliance, adverse effects.	The majority of studies reported reduction in medication discrepancies. Several studies, but not all, also reported a positive impact on ADEs and re-admissions.
Mitchell GK, Australian Journal of Primary Health, 2015	From January 2000 to July 2012 (14 studies)	Cochrane Library; Cinahl; Medline/PubMed; PsycINFO; Embase	Adults with chronic and/or complex chronic diseases	Different models that integrate specialist and primary care practitioners (based on interdisciplinary teamwork, communication\ information exchange shared care guidelines or pathways, training and education, access and acceptability for patients, viable funding model)	Clinical outcomes Process of care outcomes	Results showed a modest impact on clinical outcomes but a positive impact on process outcomes (reduction of hospital admission; length of stay)

Santomassino M, JBI Library of Systematic Reviews, 2012	Form inception to November 1, 2011 (4 studies)	Academic Search Premier; Cinahl; Eric; Health Reference Center Academic; Medline/PubMed; ProQuest Nursing and Allied Health Source; ProQuest Health Management; Cochrane Central Register of Controlled Trials; Embase; Health Source Nursing Academic; PsycINFO; Bio-Med	Adult people receiving home care services, regardless of diagnosis, stage or severity of disease, co-morbidities, or previous treatment	Models for continuity of care delivered by nurses to patients receiving home care services	Patients' satisfaction Hospital readmission	Inconclusive results on patients' satisfaction and no significant impact on hospital readmission
Liljas EM, International Journal of Integrated Care, 2019	From 1 January 1995 to 10 October 2018 (12 studies)	MedLine; Embase; Cochrane Library; Web of Science Core Collection and Ageline (EBSCO)	Older adults with multimorbidity	Organisational or systemic level of integration encompassing pooled resources (financial or human) on healthcare and social care	Hospital admission/readmission Length of hospital stay Patient satisfaction Mortality	Results showed that integrated care may have a positive impact on hospital admission, some positive impact on length of stay and possibly also on patient satisfaction and readmission but it did not have an impact on mortality
Baxter S, NIH Journals Library, 2018	From 2006 to March 2017 (267 studies)	Medline, Embase; PsycINFO; Science Citation index; Social science citation index; Cumulative index to Nursing and Allied Health Literature; Cochrane Library	Patients receiving a health-care service and/or staff delivering service	Changes to service delivery that increase integration and co-ordination of health and health-related services (introduction of integrated care pathways and multidisciplinary teams as most common changes)	Outcome related to the delivery of services (effectiveness or efficiency) or that reported an impact on the delivery of patient care or on staff delivering services	Increase of patient satisfaction and perceived quality of care and improvement of access to services. Positive effect on waiting times and in achieving patient preferences. Inconsistent evidence on other outcomes

Table 1 - Characteristics of the included studies

in regard to patients' satisfaction and no significant impact on hospital readmission.

Discussion

This paper shows that there is plenty of outcome indicators that could and should be considered in the evaluation of approaches and models for ensuring continuity of/integrated care. Nevertheless, the evidence on the topic mainly focuses on patients' satisfaction and health services use, in particular hospital admission/readmission, with other indicators less used. Independently by the approach/model used, the evidence can be considered rather consistent in showing an improvement in patients' satisfaction and a reduction in hospital admission/readmission. A slight positive impact can be also seen with respect to medication management and patients' access to services whereas more controversial results were shown in regard to perceived quality of care and other outcomes, such as mortality. These findings are important to have a broader overview of the impact of continuity of/integrated care on outcome indicators and comes on top of evidence on the impact on costs. In particular, a recent systematic review of economic evaluations of integrated care models, which have been also included in our overview (16), showed that the latter were associated with lower costs and improved outcomes as compared with usual care even though the role of some aspects, such as models adopted, and the target population should be better disentangled. The economic advantages of continuity of/integrated care should go hand in hand with health outcomes improvements. Nevertheless, the evaluation of outcome indicators is not straightforward because the outcome, namely the expected results, depends on resources and on how planned activities are put in place. This is why the evaluation of the quality of care often rely on structure, process, and outcome indicators (25). Additionally, the evaluation of continuity of/integrated care is further made complex by the fact that two perspectives should be taken into consideration, the patient' and the providers' perspective (26). Several process indicators have been proposed to evaluate continuity of/integrated care (27) and several measures have been developed to "quantify" the level of continuity of/integrated care, namely the usual provider of care (UPC), continuity of care (COC), the modified continuity index (MCI), the Bice-Boxerman continuity of care, the modified modified continuity index (MMCI), and the herfindahl index (HI), Sequential Continuity of Care Index (SECON) (28-31).

Some studies have also evaluated the relationship between these indexes and some impacts, demonstrating a reduction in costs but also in hospitalization (32-33).

Nonetheless, it should be pointed out a vast heterogeneity and inconsistency in regard to ways to measure the integrated/continuity of care across different health fields that makes results not clearly conclusive (34-35).

Nevertheless, the main results of our review find confirmation in the literature. A

previous umbrella review focused on the impact of integrated care interventions for chronic disease management on health activity found a reduction of readmissions to hospital and length of stay even though results were not considered conclusive (36). With respect to the impact on hospital admission/readmission, also a recent review performed on patients with diabetes and hypertension demonstrated an association between continuity of care and reduced health service utilization (35). Similarly, fragmentation of care at hospital level was associated to increased risk of readmission and longer hospital stay (37) and a higher continuity of care in the outpatient setting was associated with fewer hospitalizations related to ambulatory care sensitive conditions (38). As far as the improvement in medication management is concerned, also a recent review performed on patients with heart valve replacement showed that continuity of care can increase patients' awareness and adherence to therapy and ultimately quality of life (39). The improvement in quality of life was also shown by a review of reviews on the effectiveness of integrated care interventions for patients with chronic conditions (40) and could be also related to improved satisfaction that was shown by our review. All that said, it emerges that a better standardization of methods and definitions would be deserved to further address the impact of integrated/continuity of care on several health outcomes as well as on patients reported outcome and experience measures. Indeed, further research would be desirable to have a deeper knowledge of the topic. Nonetheless, albeit not based on a systematic approach, this overview could be useful to both capture the impact of models for integrated and continuity of care on outcome indicators and to identify current knowledge gaps that should deserve future attention for fostering a high-quality integrated care.

REFERENCES

1. Uijen AA, Schers HJ, Schellevis FG, Van den Bosch WJHM. How unique is continuity of care? A review of continuity and related concepts. *Fam Pract* 2012;29(3):264-71.
2. Continuity and coordination of care: a practice brief to support implementation of the WHO Framework on integrated people-centred health services. Geneva: World Health Organization; 2018.
3. Haggerty JL, Reid RJ, Freeman GK, Starfield BH, Adair CE, McKendry R. Continuity of care: A multidisciplinary review. *BMJ* 2003;327(7425):1219-2
4. Guthrie B, Saultz JW, Freeman GK, Haggerty JL. Continuity of care matters. *BMJ* 2008;337:a867.
5. Gulliford M, Naithani S, Morgan M. What is 'continuity of care'? *J Health Serv Res Policy* 2006;11(4):248-50.
6. WHO. Service delivery and safety. Available from: <https://www.who.int/servicedeliverysafety/areas/people-centred-care/ipchs-what/en/>
7. Shaw S, Rosen R, Rumbold B. What is integrated care? An overview of integrated care in the NHS. Available from: <https://www.nuffieldtrust.org.uk/files/2017-01/what-is-integrated-care-report-web-final.pdf>
8. Busetto L, Luijkx K, Vrijhoef HJM. Advancing integrated care and its evaluation by means of a uni-

- versal typology. *Int J Care Coord* 2017;20(1-2):41-44.
9. Aller M, Vargas I, Coderch J, Calero S, Cots F, Abizanda M, Farré J, Llopart JR, Colomé L, Vázquez ML. Development and testing of indicators to measure coordination of clinical information and management across levels of care. *BMC Health Serv Res* 2015;15:323.
 10. Lalonde M. *A New Perspective on the Health of Canadians*. Ottawa, Ontario, Canada: Minister of Supply and Services; 1974.
 11. European Commission. *European Core Health Indicators (ECHI)*. Available from: https://ec.europa.eu/health/indicators_data/echi_en.
 12. *Delivering quality health services: a global imperative for universal health coverage*. Geneva: World Health Organization, Organisation for Economic Co-operation and Development, and The World Bank; 2018.
 13. OECD. *Health care quality framework*. Available from: <https://www.oecd.org/els/health-systems/health-care-quality-framework.htm>
 14. Agency for Healthcare Research and Quality. Available from: <https://www.qualityindicators.ahrq.gov/>
 15. Wenger NS, Young RT. Quality indicators for continuity and coordination of care in vulnerable elders. *J Am Geriatr Soc* 2007;55 Suppl 2:S285-92.
 16. Rocks S, Berntson D, Gil-Salmerón A, Kadu M, Ehrenberg N, Stein V, Tsiachristas A. Cost and effects of integrated care: a systematic literature review and meta-analysis. *Eur J Health Econ* 2020;21(8):1211-1221.
 17. Liljas AEM, Brattström F, Burström B, Schön P, Agerholm J. Impact of Integrated Care on Patient-Related Outcomes Among Older People - A Systematic Review. *Int J Integr Care* 2019;19(3):6.
 18. Baxter S, Johnson M, Chambers D, Sutton A, Goyder E, Booth A. *Understanding new models of integrated care in developed countries: a systematic review*. Southampton (UK): NIHR Journals Library; 2018.
 19. Baxter S, Johnson M, Chambers D, Sutton A, Goyder E, Booth A. The effects of integrated care: a systematic review of UK and international evidence. *BMC Health Serv Res* 2018;18(1):350.
 20. Mitchell GK, Burrige L, Zhang J, Donald M, Scott IA, Dart J, Jackson CL. Systematic review of integrated models of health care delivered at the primary-secondary interface: how effective is it and what determines effectiveness? *Aust J Prim Health* 2015;21(4):391-408.
 21. Santomassino M, Costantini GD, McDermott M, Primiano D, Slycer JT, Singleton JK. A systematic review on the effectiveness of continuity of care and its role in patient satisfaction and decreased hospital readmissions in the adult patient receiving home care services. *JBI Libr Syst Rev* 2012;10(21):1214-1259.
 22. Spinewine A, Claeys C, Foulon V, Chevalier P. Approaches for improving continuity of care in medication management: a systematic review. *Int J Qual Health Care* 2013;25(4):403-17.
 23. Bethishou L, HerzikK, Fang N, Abdo C, Tomaszewski DM. The impact of the pharmacist on continuity of care during transitions of care: A systematic review. *J Am Pharm Assoc (2003)* 2020;60(1):163-177.e2.
 24. Reeves S, Pelone F, Harrison R, Goldman J, Zwarenstein M. Interprofessional collaboration to improve professional practice and healthcare outcomes. *Cochrane Database Syst Rev* 2017;6(6):CD000072.
 25. Donabedian A. Evaluating the quality of medical care. *Milbank Memorial Fund Quarterly* 1966;44:166-206.
 26. Meijer WJ, Vermeij DJB. A comprehensive model of cooperation between caregivers related to quality of care. *Int J Qual Health Care* 1997;9:23-33.
 27. Wenger NS, Young RT. Quality indicators for continuity and coordination of care in vulnerable elders. *J Am Geriatr Soc* 2007;55 Suppl 2:S285-92.
 28. Bice TW, Boxerman SB. A quantitative measure of continuity of care. *Med Care* 1977;347-349.
 29. Saultz JW. Defining and measuring interpersonal continuity of care. *Ann Fam Med* 2003;1:134-143.

30. Rhoades SA. The herfindahl-hirschman index. *Fed Res Bull* 1993;79:188.
31. Ejlertsson G, Berg S. Continuity of care in health care teams. A comparison of continuity measures and organisational solutions. *Scand J Prim Health Care* 1985;3:79–85.
32. Bazemore A, Petterson S, Peterson LE, Bruno R, Chung Y, Phillips RL. Higher Primary Care Physician Continuity is Associated With Lower Costs and Hospitalizations. *Ann Fam Med* 2018;16(6):492-497.
33. Hussey PS, Schneider EC, Rudin RS, Fox DS, Lai J, Pollack CE. Continuity and the costs of care for chronic disease *JAMA Intern Med* 2014;174(5):742-8.
34. Puntis S, Rugkåsa J, Forrest A, Mitchell A, Burns T. Associations between continuity of care and patient outcomes in mental health care: a systematic review. *Psychiatr Serv* 2015;66(4):354-63.
35. Chan KS, Wan EY, Chin WY, Cheng WH, Ho MK, Yu EY, Lam CL. Effects of continuity of care on health outcomes among patients with diabetes mellitus and/or hypertension: a systematic review. *BMC Fam Pract* 2021;22(1):145.
36. Damery S, Flanagan S, Combes G. Does integrated care reduce hospital activity for patients with chronic diseases? An umbrella review of systematic reviews. *BMJ Open* 2016;6: e011952.
37. Snow K, Galaviz K, Turbow S. Patient Outcomes Following Interhospital Care Fragmentation: A Systematic Review. *J Gen Intern Med* 2020;35(5):1550-1558.
38. Kao YH, Lin WT, Chen WH, Wu SC, Tseng TS. Continuity of outpatient care and avoidable hospitalization: a systematic review *Am J Manag Care* 2019;25(4):e126-e134.
39. Yuan X, Chen Y, Zhuang Y, Qin W, Lin Y. Effect of continuity of care on anticoagulant therapy and quality of life after heart valve replacement: a systematic review and meta-analysis. *Ann Palliat Med* 2021;10(5):5568-5579.
40. lanagan S, Damery S, Combes G. The effectiveness of integrated care interventions in improving patient quality of life (QoL) for patients with chronic conditions. An overview of the systematic review evidence. *Health Qual Life Outcomes* 2017;15(1):188.

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