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# Advantages of a continuous nursing system: A systematic review

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#### **Abstract**

**Background:** One of the major health challenges in the 21<sup>st</sup> century is managing chronic diseases, which place a burden on every country. The frequency of repeat care for patients with chronic conditions is rising, resulting in increased medical and treatment costs for the state. The World Health Organization suggests discharge planning through continuity of care (COC), which involves consistent communication and coordination to distribute the workload evenly among healthcare teams.

**Purpose:** To identify the benefits of a continuous nursing system for patients.

**Method:** Applying a literature review following the guidelines of the Preferred Reporting Items for Literature Review and Meta-Analyses (PRISMA). Articles were gathered from online databases including Proquest, SAGE Journals, Science Direct, and Wiley Online. The keywords used were "affect," "continuity of care," and "patient." Articles were selected based on the following inclusion criteria: focus on the benefits of a continuous nursing system for patients, publication years between 2010 and 2021, and use of cross-sectional, cohort, mixed research, and review methods. **Results:** The benefits of a continuous nursing system include lower mortality rates, reduced risk of complications, better quality of care, reduced treatment costs, improved interpersonal relationships, higher patient satisfaction, and enhanced bodily functions.

**Conclusion:** A continuous nursing system offers significant benefits to patients and can be adopted across all healthcare services and patient groups.

Keywords: Benefits; Continuous Nursing System; Patients.

### INTRODUCTION

One of the major health challenges in the 21st century is managing chronic diseases, which burden countries worldwide (Reig-Garcia, Suñer-Soler, Mantas-Jiménez, Bonmatí-Tomas, Malagón-Aguilera, Bosch-Farré, & Juvinyà-Canal, 2021; World Health Organization, 2019). Non-communicable diseases account for 70% of global deaths (Bertram, Sweeny, Lauer, Chisholm, Sheehan, Rasmussen, & Deane, 2018; Fouad, Latif, Ingram, & Hammerich, 2018; World Health Organization, 2021). In Indonesia, the prevalence of non-communicable diseases increased from 39.8% in 1990 to 69.9% in 2017 (Ministry of Health of the Republic of Indonesia, 2020). The

mortality rate from these diseases rose by 82% (Ministry of Health of the Republic of Indonesia, 2019a).

From 1990 to 2017, the incidence of chronic diseases showed significant increases, particularly in diabetes (157.1%), ischemic heart disease (113.9%), and lung cancer (113.1%) (Ministry of Health of the Republic of Indonesia, 2019a). This rise has led to higher medical and treatment costs for the state. In 2017, data from the Indonesia Health Social Security Agency indicated that 10,801,787 people, or 5.7% of National Health Insurance participants, received services for catastrophic diseases, costing 14.6 trillion

rupiahs or 21.8% of the total health service expenses (Ministry of Health of the Republic of Indonesia, 2019b). According to an April 2015 World Economic Forum publication, the potential economic loss from non-communicable diseases in Indonesia from 2012 to 2030 is projected to reach US\$ 4.47 trillion, or 5.1 times the 2012 GDP (Bloom, Chen, McGovern, Prettner, Candeias, Bernaert, & Cristin, 2015).

Patients with chronic diseases have a high risk of readmission (Brunner-La Rocca, Peden, Soong, Holman, Bogdanovskaya, & Barclay, 2020). A study in Yogyakarta found that the prevalence of readmission for patients with congestive heart failure was 52.21%, with 44.79% readmitted more than once within a year (Siallagan, Suza, & Ariani, 2018). Many studies have investigated factors that can reduce or prevent readmissions. Effective discharge planning can lower the risk of readmission within 30 days after hospital discharge (Boulding, Glickman, Manary, Schulman, & Staelin, 2011; Henke, Karaca, Jackson, Marder, & Wong, 2017).

The World Health Organization recommends discharge planning using continuity of care (World Health Organization, 2018). Generally, a continuous nursing system, defined as the relationship between patients and healthcare workers, can enhance care quality and reduce patient complications (Choi, Choi, Kim, Kim, Kim, Ko, & Park, 2020). It also involves consistent communication and coordination, balancing the workload among healthcare teams over time (Jiang, Gomes, & Vander Meer, 2023).

Many articles explore the benefits of a continuous nursing system related to age or type of disease. This article aims to examine the benefits of a continuous nursing system from all perspectives, providing a comprehensive view of its overall advantages.

#### RESEARCH METHOD

This research follows the guidelines of the Preferred Reporting Items for Literature Review and Meta-Analyses (PRISMA). Articles were sourced from online databases including ProQuest, SAGE Journals, Science Direct, and Wiley Online, using keywords such as "affect," "continuity of care," and "patient." Selection criteria focused on articles discussing the benefits of continuous nursing systems for patients, published between 2010 and 2021, and employing cross-sectional, cohort, mixed research, or review methods. Articles addressing benefits outside the sample area, such as pharmacy or student-related topics, were excluded.

The search resulted in a total of 1,603 articles: 1,084 from ProQuest, 322 from SAGE Journals, 79 from Science Direct, and 118 from Wiley Online. After screening titles and abstracts, 56 articles remained. Further evaluation based on the criteria narrowed the selection to a final total of 15 articles for in-depth review.

The reviewed articles originated from various countries, including the United Kingdom, the United States, Canada, Norway, Iran, Korea, Taiwan, and China. The sample groups were diverse, encompassing elderly patients, children, pregnant women, individuals with mental health disorders, oncology patients, and healthcare professionals. The analysis identified several benefits of continuity of care, categorized into seven areas: reducing mortality rates, decreasing the risk of complications, improving treatment quality, lowering treatment costs, enhancing interpersonal relationships, increasing patient satisfaction, and improving physical body function.

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### **RESEARCH RESULTS**

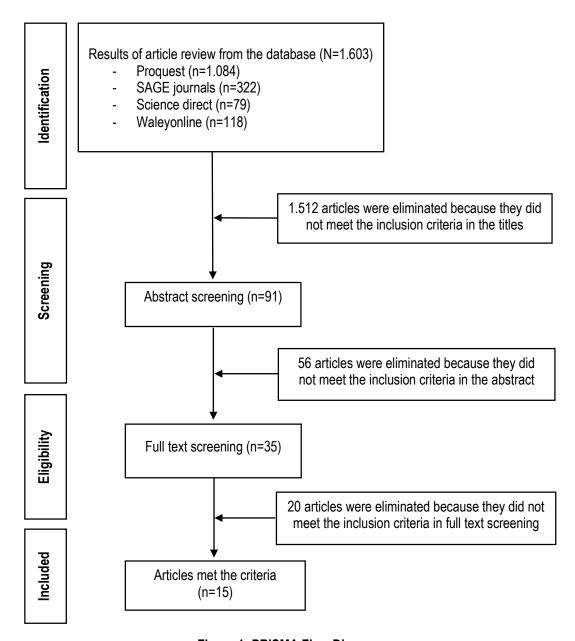


Figure 1: PRISMA Flow Diagram

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**Table 1. The Main Characteristics of Included Studies** 

Author	Purpose	Method	Results
(Gray, Sidaway- Lee, White, Thorne, & Evans, 2018).	To determine the relationship between continuity of care and mortality rates.	Systematic review without meta-analysis. Data sources from MEDLINE, Embase, and Web of Science published from 1996 to 2017. Eligibility criteria for selecting studies included articles published in English reporting on continuity of care received by patients from doctors, in any setting and country, related to patient mortality rates.	The study originated from nine countries with highly diverse cultures and healthcare systems. Heterogeneity was found in the methods of measuring continuity and mortality, as well as in the timeframe, making it impossible to combine research findings. However, 18 high-quality studies reported statistically significant decreases in mortality rates associated with increased continuity of care. Sixteen of these were attributed to all causes of death. Three did not show a relationship, and one showed mixed results. This significant protective effect occurred with both general practitioners and specialists.
(Choi et al., 2020).	To investigate the impact of continuity of care (COC) on cardiovascular disease (CVD) risk among newly diagnosed hypertensive patients.	Cohort study with a population consisting of 244,187 newly diagnosed hypertensive patients in 2004 from the National Health Insurance Service database of Korea. A Cox proportional hazards model was used to evaluate adjusted hazard ratios (aHRs) and 95% confidence intervals (CI) for CVD risk across quartiles.	Continuity of care (COC) is associated with a reduced risk of CVD, coronary artery disease (CAD), and stroke among newly diagnosed hypertensive patients. Higher COC is also linked to increased adherence to hypertension treatment. Therefore, the importance of COC should be emphasized to reduce the risk of cardiovascular complications due to hypertension.
(Tang, Cheng, Wen, & Guan, 2019).	To evaluate the impact of continuous care interventions on the quality of life of patients with neurogenic bladder.	The study was conducted using a continuous nursing care system for 3 months, which included catheter monitoring, hydration guidelines, and bladder training protocols. Health records were kept upon discharge and updated during follow-up visits.	After the 3-month care intervention, there were significantly fewer complications compared to before the intervention. Patient compliance and quality of life were significantly higher after the 3-month care intervention compared to before the intervention.

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Author	Purpose	Method	Results
(Liu, Ren, Guo, & Su, 2021).	To explore the impact of continuous nursing care on children with pneumonia, including patient survival and quality of life.	An experimental study was conducted on 90 children with pneumonia admitted to the hospital. Patients were divided into two groups: 45 patients in the routine care group received standard care, and 45 patients in the continuous care group received continuous nursing care. Researchers observed correlations between nursing effectiveness, improvement in clinical symptoms, quality of life, satisfaction, and complications.	The effectiveness in the continuous care group was 95.55%, significantly higher compared to the routine group (75.55%). The duration of hypothermia (1.75 $\pm$ 0.65 days), cough remission time (4.24 $\pm$ 1.12 days), rale remission time (4.15 $\pm$ 0.89 days), and dyspnea remission time (2.65 $\pm$ 0.65 days). The total complication rate in the continuous care group was 8.89%, much lower than in the routine group (26.67%). The continuous care group showed greater improvement after the intervention.
(Panattoni, Stone, Chung, & Tai- Seale, 2015).	To test the relationship between full-time clinical equivalence (FTE), continuity of care, access to care, and patient satisfaction with doctors.	Estimating the structural equation of a multi-level model with continuity and access as mediators. Full-time equivalent (FTE) of doctor level, continuity of care received by patients, continuity of care provided by doctors, and patient satisfaction (Press Ganey score) with doctor scores on a scale of 0–100%.	The full-time equivalent (FTE) of doctors is directly related to received continuity of care (0.172% per FTE, p < 0.001), better continuity of care (0.108% per FTE, p < 0.001), and improved access to care ( $-0.033$ days per FTE, p < 0.01), but it is associated with lower patient satisfaction scores ( $-0.080\%$ per FTE, p = 0.03). The continuity of care provided serves as a significant mediator (0.016% per FTE, p < 0.01) of the relationship between FTE and patient satisfaction; however, overall, reduced clinical hours are associated with better patient satisfaction ( $-0.053\%$ per FTE, p = 0.03).
(Dahlberg, & Aune, 2013).	To gain a deeper understanding of relational continuity in the childbirth process.	The Q-methodology approach enables researchers to systematically assess subjectivity. Twenty-three women were invited to rank a sample of 48 statements regarding their subjective views on childbirth experiences. Data analysis was conducted	Both factors indicate the importance of quality in relationships. Factor one represents the experience of presence and emotional support in the relationship. Factor two is characterized by the experience of predictability in the relationship and process, as well as feelings of mutual interdependence within that relationship.

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Author	Purpose	Method	Results
		using the statistical software 'PQ' to identify weak and strong factors, which were then interpreted.	
(Oh, Jung, Kim, Kim, & Ha, 2021).	To investigate the relationship between continuity of care (COC), surgery, and costs associated with chronic shoulder pain.	The study used a sample of patients from the National Health Insurance Review and Assessment Service (HIRA-NPS) in 2017. The Bice-Boxerman Continuity of Care Index was used as an indicator to measure COC.	The majority of patients were aged 40-65 years (high COC: 68.4%; low COC: 64.4%). The odds ratio (OR) for surgery was 0.41 in the high COC group compared to the low COC group (95% CI, 0.20-0.84). Direct medical costs were 14.09% lower (95% CI, 8.12-19.66%), and operational costs were 58.00% lower (95% CI, 57.95-58.05) in the high COC group. Interaction with COC and shoulder impingement syndrome resulted in significantly lower direct medical costs (15.05% [95% CI, 1.81-26.51%]).
(Pu, & Chou, 2016).	To determine whether continuity of care (COC) is beneficial in a national healthcare system without referral management by controlling for the endogeneity of COC.	Using National Health Insurance claim data from Taiwan in 2008, covering approximately 23 million people, to determine whether COC is associated with reduced emergency room (ER) utilization by hypertension and diabetes patients in 2009. To address the endogeneity related to patients' COC levels, researchers employed an instrumental variable approach.	After controlling for endogeneity, the marginal effect of COC on the likelihood of using the emergency room (ER) when the COC score increases from 0 to 1 is 7.6% (P <0.001) and 14.8% (P <0.001) respectively for hypertension and diabetes patients.
(Reddy, Wong, Canamucio, Nelson, Fihn, Yoon, & Werner, 2018).	To study the relationship between team-based care and continuity of care with high-cost healthcare utilization, including hospitalizations for all causes, ambulatory care sensitive	Retrospective cohort study of 1.2 million VA-Medicare dual-eligible veterans with VA primary care provider (PCP) eligibility in 2012. Clinics were categorized as low, moderate, or high team-function based on survey data. Primary outcomes included total	The increasing implementation of continuous nursing systems and team function based on clinical care is associated with reduced patient hospital visits. In other words, the enhancement of continuous nursing system services must be accompanied by increased involvement of each team member. With this increase, the role of continuous nursing systems becomes more significant.

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Author	Purpose	Method	Results
	conditions (ACSC) hospitalizations, and emergency hospitalizations.	hospitalizations for all causes, ambulatory care sensitive conditions (ACSC) hospitalizations, and emergency department visits in 2013.	
(Van Walraven, Oake, Jennings, & Forster, 2010).	To identify and summarize all methodological studies measuring the relationship between continuity of care and patient outcomes.	The literature study used the MEDLINE database (1950–2008) with inclusion criteria of English language, measuring continuity, determining the relationship of continuity, and considering the relative timing of continuity measurements.	Eight out of nine high-quality studies found a significant relationship between increased continuity and decreased utilization of health services, including hospitalizations and emergency visits. Five out of seven studies found increased patient satisfaction with increased continuity.
(Catty, White, Clement, Cowan, (Geyer, Harvey, & Burns, 2013).	To assess the relationship between user characteristics and components of continuity of care, as well as the impact of continuity on clinical and social functions.	The cross-sectional study involved 180 users of community mental health teams with psychotic disorders who were interviewed over three annual periods to assess their experiences with continuity of care and their clinical and social functions.	Improvements in quality of life were associated with higher continuity scores, better experiences and relationships (as assessed by users and therapeutic relationships), and lower scores on continuity of needs fulfillment. Higher scores in meeting needs were linked to reduced symptoms.
(Chen, Tu, & Chen, 2017).	To assess the effectiveness of COC strategies on elderly individuals with chronic diseases towards quality of life based on the Short Form-36 (SF-36).	Literature review study from four English- language electronic databases: MEDLINE, PubMed, Cumulative Index to Nursing and Allied Health Literature (CINAHL), and Cochrane Library.	The COC intervention significantly improved the quality of life of elderly individuals with chronic diseases in terms of physical function, role limitations due to physical health, overall physical health, social functioning, and mental sharpness. However, no significant effect was found on bodily pain, mental health, and role limitations due to emotional problems.

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Author	Purpose	Method	Results
(Velikova, Keding, Harley, Cocks, Booth, Smith, & Brown, 2010).	To measure the impact on patient satisfaction and perspective regarding continuity and coordination of care.	Prospective trial involving 28 oncology specialists and 286 randomized cancer patients. The intervention group received regular touchscreen HRQOL assessments with feedback to doctors, while the control group received HRQOL assessments without feedback and no HRQOL evaluation.	The intervention group rated continuity of care better than the control group for the communication subscale (p=0.03). No significant effect was found for coordination of regular doctor visits. Patient evaluations in the intervention group were positive and indicated that HRQOL assessments were beneficial compared to the control group.
(Parker, Corden, & Heaton, 2011).	To assess how the project develops conceptualization, measures sustainability, and enhances knowledge.	Systematic review.	The experience of a continuous nursing system influences administrative structure and services, professional characteristics, participation, overall context from a humanistic perspective, and satisfaction.
(Shahinfar, Abedi, Najafian, Abbaspoor, Mohammadi, & Alianmoghaddam, 2021).	To understand women's perceptions of the continuity of midwifery care teams in Iran.	Qualitative research conducted in Iran from October 2019 to August 2020. Sampling was done through purposive sampling, interviews were digitally recorded and transcribed verbatim in Persian, and analyzed using conventional content analysis.	Through continuous nursing care, patient self-improvement during antenatal classes and the effectiveness of midwife interaction with mothers are enhanced. Additionally, maternal satisfaction during pregnancy, childbirth, and postpartum is achieved

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### DISCUSSION

In the realm of continuous healthcare, three types clinical coordination are delineated: interconnectedness involving planned handoffs that responsibly align with parallel care processes, collaboration marked by jointly agreed responsibility sharing for indirect influence, and coordination through tools, incentives, or educational means (Øvretveit, 2011). The classification of sustainability elements and care coordination reveals some overlap. For example, interpersonal continuity and longitudinal sustainability facilitate effective care coordination for individuals, promoting integrated and person-centered care across diverse healthcare settings and times (Chen, Chiang, Lin, & Cheng, 2023). Interconnectedness and parallel coordination are pathways facilitated by sustainable management, where professional collaboration transcends boundaries to deliver high-quality care. Numerous factors influence care coordination, including protocols, care pathways, financial aspects. technology, education, management practices, and information management within healthcare sustainability (Oh, 2022).

Healthcare professionals generally consider continuous care systems fundamental to their profession, sustaining therapeutic relationships and enhancing understanding of individual needs and their continuity, thereby facilitating patient-centered care planning (Barker, Steventon, & Deeny, 2017; Jiang et al., 2023). Longitudinal sustainability over time is ensured through care provider indices, which provide contact information for accessing healthcare services (Cheng. Chen. & Lin. 2023). Individuals in remote areas often face longer wait times and shorter healthcare consultations (World Health Organization, 2018). Research underscores the need for robust primary and community healthcare systems, especially in countries still developing primary care services, ensuring the adoption of continuous care systems to enhance access and transportation in rural communities (Khatri, Endalamaw, Erku, Wolka, Nigatu, Zewdie, & Assefa, 2023).

Many articles incorporate continuous care systems into healthcare service interventions (Khatri et al., 2023; Gray, Sidaway-Lee, Johns, Rickenbach, & Evans, 2023; Jiang et al., 2023; Ljungholm, Edin-Liljegren, Ekstedt, & Klinga, 2022; Lunsford, 2023). Several studies demonstrate effective outcomes with

continuous care services (Cheng et al., 2023). This effectiveness is likely due to the interdependence within complex multidimensional nursing interventions and their supporting structures. Summarizing these effects and emphasizing changes in the roles and outcomes of continuous care systems can be challenging. Traditional programmatic systems complicate evaluation. Considerations in evaluating continuous care systems include study time frames, regression constraints, averages, healthcare system variances, social functions, and individual dimensions of healthcare providers in cohort comparisons.

Most findings come from systematic reviews (Franklin, 2014; Van Walraven et al., 2010; Carter, Bryant-Lukosius, DiCenso, Blythe, & Neville, 2014; Øvretveit, 2011), with some integrating both quantitative and qualitative research (Baker, Boulton, Windridge, Tarrant, Bankart, & Freeman, 2007; Barker et al., 2017; Pu & Chou, 2016; Choi et al., 2020; Reddy et al., 2018; Panattoni et al., 2014; Shahinfar et al., 2021; Dahlberg & Aune, 2013). This research encompasses diverse groups, including older adults, mothers across various stages of childbirth, children with health conditions, and patients with chronic illnesses, indicating nearly universal positive experiences with continuous care systems.

Articles reviewed represent several high-income countries, identifying practical priorities related to improving nursing quality, enhancing existing system outcomes, and fostering positive experiences for patients and healthcare providers. The World Health Organization offers recommendations implementing continuous care systems to bolster support for individuals and communities, providing opportunities, skills, and resources for healthcare services and education without neglecting community and individual sources at all levels (Khatri et al., 2023). This support encompasses identifying sources and groups, ensuring accessible access, and maximizing benefits from high-quality services, striving to meet specific needs. Emphasizing care models ensures the efficient and effective provision of healthcare services (Bahr & Weiss, 2019; Liao, Zeng, Xu, & Yang, 2018). This innovative model prioritizes primary and community healthcare services, focusing on patient transitions from inpatient to outpatient care and from treatment to prevention. This necessitates comprehensive investment and care, incorporating

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health promotion and disease prevention strategies to promote healthy living. Coordination within and across sectors includes integrated healthcare services within and across sectors (Ljungholm et al., 2023; Oh, 2022), building interconnected systems and networks at every level and forging connections between health and other sectors. Intersectional action at the community level addresses health disparities and optimizes the use of resources, such as private sector relationships over time. The primary focus of coordination is to deliver continuous care and ensure seamless information flow among different service providers.

### CONCLUSION

Continuous nursing care systems can be implemented across all healthcare service ranges and patient groups. Continuous nursing care systems depend on informal care, family support, community health workers, funding sources, and social innovation.

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