



Adaptation and its validation of the CCAENA questionnaire (a tool for the measurement of continuity of care between care levels from the user's perspective) in Colombia and Brazil

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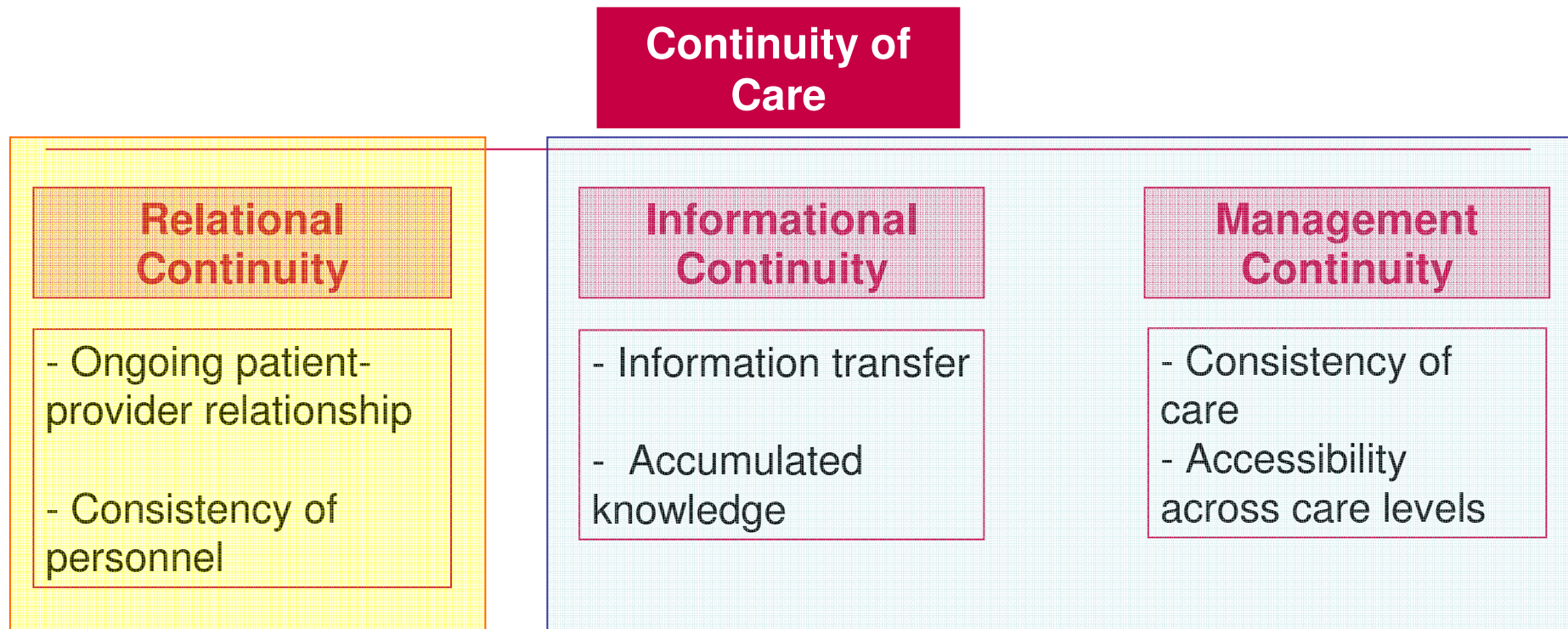
Content

- Introduction
- Aim
- Method
- Results
- Conclusion

Conceptual framework

Continuity of Care: degree to which patients experience care over time as coherent and connected and consistent ¹

The result of the coordination of services from the patients' point of view



¹ Reid R, Haggerty J, McKendry R, Defusing the confusion: concepts and measures of continuity of healthcare, Ottawa: Canadian Health Services Research Foundation; 2002

Background

- Continuity of care is associated with:
 - Higher patient satisfaction
 - Higher utilization of preventive services
 - Higher rates of treatment adherence
 - Reduction in hospitalization rates

- Available instruments focus on:
 - one type of continuity of care (generally relational continuity)
 - one level of care
 - a condition (diabetes, mental health, etc.)

The CCAENA questionnaire

CCAENA: continuity of care between care levels

- Composed by two interrelated sections which could be applied independently
- Each section addresses the 3 types of continuity of care across care levels
 - the patient's experiences
 - the patient's perspective (likert scales)
- Designed and validated for the Spanish context ^{1,2}

1 Letelier MJ, Aller MB, Henao D, et al. [Design and validation of a questionnaire to measure continuity between care levels from the user's perspective]. Gac Sanit. 2010;24:339-46.2

2 Aller MB, Vargas I, Garcia-Subirats I, et al. A tool for assessing continuity of care across care levels: an extended psychometric validation of the CCAENA questionnaire. Int J Integr Care. 2013.

Context of the study: the Equity-LA project

- **Equity-LA**

- **Aim:** to analyse the impact of different types of integrated health care networks on health care access and health care provision efficiency in Colombia and Brazil

- To analyse the performance of different types of IHN relating to their final aims of continuity of care and efficiency and contextual and internal factors influencing it

Context of the study

Description of the health systems

- **Colombia**

- General System of Social Security in Health (*Sistema General de Seguridad Social en Salud, SGSSS*)
- Two insurance schemes according to ability to pay: contributory and subsidized
- Based on a managed competition model (insurers and providers)

- **Brazil**

- Unified Health System (*Sistema Único de Saúde, SUS*)
- Universal access to health care
- Tax funded
- Private subsystem (Supplementary system)

Health care delivery organization

- Care organized by levels of complexity:
 1. Primary care as the entry point and care coordinator for the patient
 2. Secondary level in a supporting role

Assessment of the continuity of care in both countries

- Few studies published in Colombia and Brazil evaluating the continuity of care across care levels
 - In **Colombia**, studies focused on some specific diseases
 - In **Brazil** the Primary Care Assessment Tool was validated (PCAT) that assess continuity of care at the primary care level^{1,2}

1 Macinko J, Almeida CM, de Sá PK. A rapid assessment methodology for the evaluation of primary care organization and performance in Brazil. Health Policy Plan. 2007;22:167-77.

2 Harzheim E, Starfield B, Rajmil L, Alvarez-Dardet C, Stein AT. [Internal consistency and reliability of Primary Care Assessment Tool (PCATool-Brasil) for child health services]. Cad Saude Publica. 2006 Aug;22(8):1649-59.

Aim

- To **adapt** and to **validate** a shortened version of the CCAENA questionnaire in the Colombian and Brazilian health system's contexts

Methods

1. Adaptation

- ▶ Items selection of the CCAENA questionnaire
- ▶ Transcultural adaptation

2. Application

- ▶ User survey

3. Validation

- ▶ Content validity (experts)
- ▶ Comprehensibility

Item analysis

- ▶ Construct validity (factor analysis)
- ▶ Reliability: internal consistence (Cronbach's alpha)

Scale score analysis

- ▶ Multidimensionality (spearman correlation)
- ▶ Discriminant analysis (chi square test)

Adaptation

1. Adaptation

- ▶ Items selection of the CCAENA questionnaire
- ▶ Transcultural adaptation

➡ Items that best characterised each subscale were chosen
21 items in the CCAENA questionnaire → selection of 14 items

➡ Translation and/or adaptation to the context



1. Adaptation

- ▶ Items selection of the CCAENA questionnaire
- ▶ Transcultural adaptation

2. Application

- ▶ User survey

Application

Design

Cross-sectional study by means of a questionnaire in two municipalities of Colombia and Brazil. February to June 2011

Study population

People who had had at least one health problem or had visited the health services during the three months prior to the survey and who resided in the study areas.

Sample

Based on estimated proportion of 50%; degree of confidence: 90% (alpha error of 0.1); precision: 2.5 (see figure)

Sampling procedure

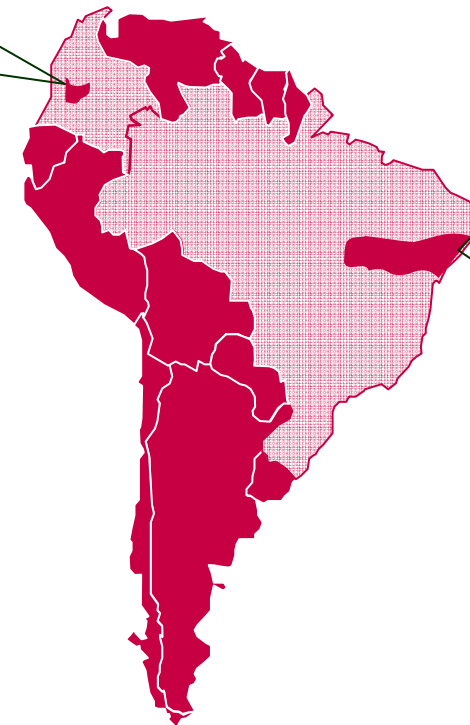
Multistage sampling based on census tracts:

Stage I. Random sampling (with replacement) of census tracts

Stage II. Systematic random sampling of individuals

Study areas and sample size

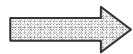
- Kennedy, Bogotá (n = 1,080)
- Soacha (n = 1,081)



- Recife (District III) (n = 1,077)
- Caruaru (n = 1,080)

Validation

1. **Adaptation**
 - ▶ Items selection of the CCAENA questionnaire
 - ▶ Transcultural adaptation
2. **Application**
 - ▶ User survey
3. **Validation**
 - ▶ Content validity (experts)
 - ▶ Comprehensibility



Experts in:

- elaboration of questionnaires
- analysis of continuity of care
- healthcare management

Validation (II)

1. **Adaptation**
 - ▶ Items selection of the CCAENA questionnaire
 - ▶ Transcultural adaptation
2. **Application**
 - ▶ User survey
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 - ▶ Content validity (experts)
 - ▶ Comprehensibility

➡ *1st pre-test*: cognitive interviews (n=10 in Colombia, n = 4 in Brazil)



Acceptability and comprehensibility

➡ *Pilot*: application in real conditions (n=40 in each country)

Feasibility in normal conditions

➡ *2nd pre-test*: cognitive interviews (n=4 in Colombia, n = 4 in Brazil)

Acceptability and comprehensibility of the modified questions

Final version of the scale

Types and dimensions	Attributes of continuity	Items
Relational continuity: PC physician-patient relationship	Trust between providers and patients	1 - I have confidence in the professional ability of my GP
		2 - I feel comfortable consulting my GP about my doubts or health problems
		3 - I would recommend my GP to my family and friends
	Effective communication	4 - The information my GP gives me is sufficient
SC physician-patient relationship	Trust between providers and patients	5 - have confidence in the professional ability of the specialists treating me
		6 - I feel comfortable consulting the specialists about my doubts
		7 - I would recommend my specialists to my friends and family
	Effective communication	8 - The information the specialists give me is sufficient
Informational continuity: Transfer of information	Knowledge of medical history	9 - My GP is aware of the instructions given to me by the specialist before I explain them to him/her
		10 - The specialist is aware of the instructions given to me by my GP before I explain them to him/her
	Delivery of timely and adequate information to patient	11 - After seeing the specialist my GP discusses the visit with me
Managerial continuity: Care coherence	Adequate sequence of care	12 - My GP is in agreement with the specialist's instructions
		13 - The specialist is usually in agreement with my GP's instructions
	Coordination across care levels	14 - I believe that the care I receive from my GP and the specialist is coordinated

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Item analysis

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Item analysis: construct validity

Factor analysis

Colombia
(n = 497)

- To examine the factor structure of the scale, only cases in which patients responded to all items were used

Dimension of the continuity of care	Item	Rotation factor loadings			
		Factor 1	Factor 2	Factor 3	
<i>Patient - PC provider relationship (RC)</i>	Item 1	0.1589	0.1565	0.7722	
	Item 2	0.1509	0.1565	0.7273	
	Item 3	0.2242	0.2388	0.7442	
	Item 4	0.1667	0.2031	0.7804	
<i>Patient - SC provider relationship (RC)</i>	Item 5	0.8283	0.1430	0.0926	
	Item 6	0.8183	0.1325	0.1637	
	Item 7	0.8211	0.1474	0.2146	
	Item 8	0.8050	0.1813	0.1454	
<i>Continuity across levels:</i>	Item 9	0.1199	0.5597	0.2198	
	Item 10	0.2412	0.4418	0.1405	
	- <i>Transfer of medical information (IC)</i>	Item 11	0.0629	0.7282	0.1781
	- <i>Care coherence across care levels (MC)</i>	Item 12	0.2543	0.7511	0.2433
		Item 13	0.2680	0.7209	0.1637
		Item 14	0.2214	0.6156	0.3095

Items structure reflects the conceptual structure

Item analysis: construct validity

Factor analysis

Colombia
(n = 497)

- To examine the factor structure of the scale, only cases in which patients responded to all items were used

Dimension of the continuity of care	Item	Rotation factor loadings		
		Factor 1	Factor 2	Factor 3
<i>Patient - DC provider relationship (DC)</i>	Item 1	0.1589	0.1565	0.7722
	Item 2	0.1509	0.1565	0.7273
<i>Patient - SC provider relationship (SC)</i>	Item 7	0.8211	0.1474	0.2146
	Item 8	0.8050	0.1813	0.1454
<i>Continuity across levels:</i>	Item 9	0.1199	0.5597	0.2198
	Item 10	0.2412	0.4418	0.1405
<i>- Transfer of medical information (IC)</i>	Item 11	0.0629	0.7282	0.1781
<i>- Care coherence across care levels (MC)</i>	Item 12	0.2543	0.7511	0.2433
	Item 13	0.2680	0.7209	0.1637
	Item 14	0.2214	0.6156	0.3095

- Number of retained factors following the Kaiser criterion: eigenvalues > 1
- Factor loadings were considered meaningful > 0.40

Items structure reflects the conceptual structure

Item analysis: construct validity (II)

Factor analysis

Brazil
(n = 322)

- To examine the factor structure of the scale, only cases in which patients responded to all items were used

Dimension of the continuity of care	Item	Rotation factor loadings			
		Factor 1	Factor 2	Factor 3	Factor 4
<i>Patient - PC provider relationship (RC)</i>	Item 1	0.0742	0.7695	0.1139	
	Item 2	0.1966	0.7441	0.0820	
	Item 3	0.1809	0.7931	0.2503	
	Item 4	0.1311	0.8067	0.1313	
<i>Patient - SC provider relationship (RC)</i>	Item 5	0.7612	0.1333	0.1668	
	Item 6	0.8189	0.1267	0.0630	
	Item 7	0.8765	0.1648	0.1636	
	Item 8	0.8436	0.0887	0.1381	
<i>Continuity across levels:</i>	Item 9	0.0168	0.1441	0.4307	0.6517
	Item 10	0.0788	0.0709	0.3937	0.6717
<i>- Transfer of medical information (IC)</i>	Item 11	0.1376	0.2218	0.6969	0.1502
<i>- Care coherence across care levels (MC)</i>	Item 12	0.2301	0.1170	0.7309	0.2084
	Item 13	0.2121	0.1765	0.7176	0.2602
	Item 14	0.1981	0.2735	0.6326	0.2513

Item analysis: construct validity (III)

Factor analysis

Brazil
(n = 322)

- Brazil, number of factors limited to three

		Rotation factor loadings		
Dimension of the continuity of care	Item	Factor 1	Factor 2	Factor 3
<i>Patient - PC provider relationship (RC)</i>	Item 1	0.1215	0.0739	0.7707
	Item 2	0.1077	0.1940	0.7416
	Item 3	0.2384	0.1871	0.7972
	Item 4	0.1371	0.1312	0.876
<i>Patient - SC provider relationship (RC)</i>	Item 5	0.1829	0.7613	0.1344
	Item 6	0.0796	0.8165	0.1242
	Item 7	0.1447	0.8791	0.1673
	Item 8	0.1038	0.8470	0.0926
<i>Continuity across levels:</i>	Item 9	0.7198	-0.0057	0.1354
	Item 10	0.6972	0.0550	0.0588
	Item 11	0.6627	0.1628	0.2367
	Item 12	0.7207	0.2544	0.1294
	Item 13	0.7378	0.2320	0.1865
	Item 14	0.6662	0.2110	0.2840

Items structure forced to three factors reflects the conceptual structure

Item analysis: reliability

Cronbach's alpha

	Colombia	Brazil
• Ongoing patient – GP relationship	0.871	0.863
• Ongoing patient – specialist relationship	0.906	0.894
• Continuity across levels	0.868	0.866
– Clinical information transfer	0.755	0.748
– Consistency of care	0.834	0.821

Alpha values > 0.70 → adequate level of internal consistency

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Scale score analysis

- ▶ Multidimensionality (spearman correlation)
- ▶ Discriminant analysis (chi square test)

Scale scores

Types and dimensions	Attributes of continuity	Score
Relational continuity: PC physician-patient relationship	Trust between providers and patients	Patient-primary care provider relationship
	Effective communication	
SC physician-patient relationship	Trust between providers and patients	Patient-secondary care provider relationship
	Effective communication	
Informational continuity: Transfer of information	Knowledge of medical history	Continuity across care levels <ul style="list-style-type: none"> - Transfer of medical information across care levels - Care coherence across care levels
	Delivery of timely and adequate information to patient	
Managerial continuity: Care coherence	Adequate sequence of care	
	Coordination across care levels	

Scale score analysis: multidimensionality

Spearman correlation

Colombia
(n = 497)

		Continuity across care levels				
		Patient- PC provider relationship (RC)	Patient- SC provider relationship (RC)	Full scale	Transfer of medical information across care levels (IC)	Care coherence across care levels (MC)
Patient- PC provider relationship (RC)		--	0.3574	0.4044	0.3678	0.4323
Patient- SC provider relationship (RC)			--	0.3587	0.3294	0.4328
Continuity across care levels	Full scale			--	--	--
	Transfer of medical information across care levels (IC)				--	0.6968
	Care coherence across care levels (MC)					--

Spearman correlation < 0.7 → the constructed factors can be seen as separated scales

Scale score analysis: multidimensionality

Spearman correlation

Brazil
(n = 327)

		Continuity across care levels				
		Patient- PC provider relationship (RC)	Patient- SC provider relationship (RC)	Full scale	Transfer of medical information across care levels (IC)	Care coherence across care levels (MC)
Patient- PC provider relationship (RC)		--	0.3017	0.4197	0.3716	0.4292
Patient- SC provider relationship (RC)			--	0.3504	0.2388	0.3901
Continuity across care levels	Full scale			--	-	-
	Transfer of medical information across care levels (IC)				--	0.6775
	Care coherence across care levels (MC)					--

Spearman correlation < 0.7 → the constructed factors can be seen as separated scales

Scale score analysis: discriminant analysis

Differences in score between groups

Colombia

	PC physician-patient relationship		SC physician-patient relationship		Continuity across levels					
	%	p-value	%	p-value	Full scale		Transfer of information		Consistency of care	
					%	p-value	%	p-value	%	p-value
Age										
<i>18-40</i>	65.7	<0.001	67.2	<0.001	69.9	0.622	71.9	0.036	71.2	0.371
<i>>65</i>	81.9		82.2		72.7		60.1		76.0	
Self-rated health										
<i>Good or very good</i>	73.4	0.001	75.9	0.032	74.4	0.004	70.8	0.119	77.7	0.001
<i>Fair, poor or very poor</i>	64.7		69.3		62.3		64.7		64.8	
Chronic disease										
<i>No</i>	67.7	0.009	69.3	0.009	67.2	0.304	65.0	0.094	70.0	0.238
<i>Yes</i>	74.4		77.6		71.4		71.6		74.7	
Study area										
<i>Soacha</i>	72.1	0.108	71.0	0.243	68.8	0.889	67.4	0.744	73.0	0.759
<i>Kennedy</i>	68.2		74.6		69.4		68.7		71.7	

Scale score analysis: discriminant analysis

Differences in score between groups

Brazil

	PC physician-patient relationship		SC physician-patient relationship		Continuity across levels					
					Full scale		Transfer of information		Consistency of care	
	%	p-value	%	p-value	%	p-value	%	p-value	%	p-value
Age										
18-40	76.2	0.107	75.0	0.062	49.3	<0.001	40.2	0.002	52.0	<0.001
>65	81.9		82.4		72.7		60.1		76.0	
Self-rated health										
<i>Good or very good</i>	84.3	0.223	86.1	0.060	72.1	0.470	59.0	0.496	75.5	0.285
<i>Fair, poor or very poor</i>	81.3		80.3		68.2		55.4		69.9	
Chronic disease										
No	79.7	0.020	81.2	0.509	64.7	0.077	53.4	0.287	67.3	0.093
Yes	85.2		83.1		73.7		58.7		75.5	
Study area										
Recife	87.2	<0.001	86.2	<0.001	74.8	0.006	60.2	0.039	77.4	0.002
Caruaru	75.6		75.9		60.2		49.7		61.8	

Conclusion

- The questionnaire is a useful, valid and reliable instrument for evaluating continuity of care across different levels of care from the users' perspective
 - Validity and reliability of the shortened version of the CCAENA are adequate in both countries
- Maintaining high equivalence with the original version
- First instrument in Colombia and Brazil that evaluates
 - Perceptions of the three types of continuity of care
- The use of the same scale validated in different contexts allow for international comparisons
- It will be applied in six more countries (Equity-LA II: Argentina, Brazil, Chile, Colombia, Mexico and Uruguay)



Thanks for your attention!

Irene Garcia-Subirats

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Related publications

Validation of the CCAENA

- Aller MB, Vargas I, Garcia-Subirats I, Coderch J, Colomé LI, Llopart JR, Ferran M, Sánchez-Pérez I, Vázquez ML. **A tool for assessing continuity of care across care levels: an extended psychometric validation of the CCAENA questionnaire.** Int J Integr Care 2013; 13:e050.
- Letelier MJ, Aller MB, Henao D, et al. **[Design and validation of a questionnaire to measure continuity between care levels from the user's perspective]**. Gac Sanit. 2010;24:339-46.2

Application of the CCAENA

- Aller MB, Colomé JM, Waibel S, Vargas I, Vázquez ML. **A first approach to differences in continuity of care perceived by immigrants and natives in the Catalan public healthcare system.** Int J Environ Res Public Health. 2013; 10:1474-88.
- Aller MB, Vargas I, Waibel S, Coderch J, Sánchez-Pérez I, Colomé LI, Llopart JR, Ferran M, Vázquez ML. **A comprehensive analysis of patients perceptions of continuity of care and their associated factors.** Int J Quality Health Care. 2013; Jul;25(3):291-9.
- Aller MB, Vargas I, Waibel S, Coderch-Lassaletta J, Sánchez-Pérez I, Llopart JR, Colomé LI, Ferran M, Garcia-Subirats I, Vázquez ML. **Factors associated to experienced continuity of care between primary and outpatient secondary care in the Catalan public healthcare system.** Gac Sanit. 2013;27:207-13.