Doctors' experience of coordination across care levels and associated factors. A cross-sectional study in public healthcare networks of six Latin American countries

María-Luisa Vázquez [a, *], Ingrid Vargas [a], Irene Garcia-Subirats [a], Jean-Pierre Unger [b], Pierre De Paepe [b], Amparo Susana Mogollón-Pérez [c], Isabella Samico [d], Pamela Eguiguren [e], Angelica-Ivonne Cisneros [f], Adriana Huerta [g], María-Cecilia Muruaga [h], Fernando Bertolotto [i]

[a] Health Policy and Health Services Research Group, Health Policy Research Unit, Consortium for Health Care and Social Services of Catalonia, Avinguda Tibidabo 21, ES08022 Barcelona, Spain
[b] Public Sector Care Unit, Department of Public Health, Prince Leopold Institute of Tropical Medicine, Nationalestraat 155, 2000 Antwerpen, Belgium
[c] Escuela de Medicina y Ciencias de la Salud, Universidad del Rosario, Cra 24 No. 63C-69, Quinta Mutis, 11001 Bogotá, Colombia
[d] Grupo de Estudos de Gestão e Avaliação em Saúde, Instituto de Medicina Integral Prof. Fernando Figueira, Rua Dos Coelhos No. 300, Boa Vista, 50070-550 Recife, Brazil
[e] Escuela de Salud Pública Dr. Salvador Allende Gossens, Facultad de Medicina, Universidad de Chile, Avenida Independencia, 939, Santiago de Chile, Chile
[f] Instituto de Salud Pública, Universidad Veracruzana, Av. Dr. Luis Castelazo Ayala s/n Col. Industrial Ánimas, 91190 Xalapa, Veracruz, Mexico
[g] Área de Investigación, Secretaría de Salud Pública Municipal. San Luis 2020, 2000 Rosario, Argentina
[h] Universidad Nacional de Rosario, Maipú 1065, 2000, Rosario, Argentina
[i] Facultad de Enfermería, Universidad de la República, Avenida 18 de Julio 124, 11200 Montevideo, Uruguay

ABSTRACT

Improving coordination between primary care (PC) and secondary care (SC) has become a policy priority in recent years for many Latin American public health systems looking to reinforce a healthcare model based on PC. However, despite being a longstanding concern, it has scarcely been analyzed in this region. This paper analyses the level of clinical coordination between PC and SC experienced by doctors and explores influencing factors in public healthcare networks of Argentina, Brazil, Chile, Colombia, Mexico and Uruguay. A cross-sectional study was carried out based on a survey of doctors working in the study networks (348 doctors per country). The COORDENA questionnaire was applied to measure their experiences of clinical management and information coordination, and their related factors. Descriptive analyses were conducted and a multivariate logistic regression model was generated to assess the relationship between general perception of care coordination and associated factors. With some differences between countries, doctors generally reported limited care coordination, mainly in the transfer of information and communication for the follow-up of patients and access to SC for referred patients, especially in the case of PC doctors and, to a lesser degree, inappropriate clinical referrals and disagreement over treatments, in the case of SC doctors. Factors associated with a better general perception of coordination were: being a SC doctor, considering that there is enough time for coordination within consultation hours, job and salary satisfaction, identifying the PC doctor as the coordinator of patient care across levels, knowing the doctors of the other care level and trusting in their clinical skills. These results provide evidence of problems in the implementation of a primary care-based model that require changes in aspects of employment, organization and interaction between doctors, all key factors for coordination.

* Corresponding author.
E-mail addresses: mlvazquez@consorci.org (M.-L. Vázquez), ivargas@consorci.org (I. Vargas), igarcia@consorci.org (I. Garcia-Subirats), jpunger@itg.be (J.-P. Unger), pdpaepe@itg.be (P. De Paepe), amparo.mogollon@urosario.edu.co (A.S. Mogollón-Pérez), isabella@imip.org.br (I. Samico), peguiguren@u.uchile.cl (P. Eguiguren), equitylamexico@outlook.com (A.-I. Cisneros), huerta.adriana@gmail.com (A. Huerta), maramuru@hotmail.com (M.-C. Muruaga), fbertolotto@fenf.edu.uy (F. Bertolotto).

1. Introduction

The coordination of health care between care levels lies at the heart of the current strategy of the Pan-American Health Organization for improving primary care and the services integration policies adopted by numerous Latin American governments in recent years (PAHO, 2010). Among other aspects, they aim to strengthen the model based on primary care, which acts as coordinator in the care of the patient along the continuum of the health services in the network (PAHO, 2010). In this model, information transfer, adequate and timely access between care levels, and agreement on the clinical management of patients are key to providing quality care and preventing inefficiencies and discontinuity of care, especially for those patients with chronic conditions who tend to use a greater array of services (Mehrotra et al., 2011).

The improvement of care coordination between care levels, i.e. primary care (PC) and secondary care (SC), is a longstanding concern in Latin American health systems, which is evidenced by successive attempts to organize the referral system and make the health services function as a network (Giovanella et al., 2015). Existing evaluations, which are scarce, point to limited coordination in the health services networks due to the deficient transfer of clinical information between levels (Harris et al., 2007; Vargas et al., 2015); some highlight difficulties in access to SC for referred patients (Garcia-Subirats et al., 2014) and, to a lesser extent, disagreement over treatments or referrals (Pardo et al., 2008; Ramírez, 2009). Studies are needed on care coordination between levels that consider the different types and dimensions and explanatory factors, as these are almost inexistent for Latin America (Turci et al., 2015; Vargas et al., 2016).

This study is part of a wider research project (Vazquez et al., 2015), which aims to evaluate the effectiveness of a participatory shared care strategy in improving coordination across care levels in health services networks in six different healthcare systems of Latin America. The aim of this paper, that presents the comparative results of the baseline, is to determine the level of clinical coordination between PC and SC experienced by doctors and to explore influencing factors in public healthcare networks of Argentina, Brazil, Chile, Colombia, Mexico and Uruguay.

1.1. The conceptual framework

There has been an extraordinary increase in publications on care coordination in recent years, but the lack of consensus on definitions remains (Shultz and McDonald, 2014). Many of them are limited to particular patient populations, settings, transitions or types of coordination. This study adopts the broad definition of Longest and Young (2000): care coordination is the harmonious connection of the different services needed to provide care to a patient along the care continuum in order to achieve a common objective without conflicts. Although coordination of care may also involve social services and require the coordination of other activities such as administrative procedures, this paper focuses specifically on clinical care coordination. Two interrelated types of clinical coordination are distinguished (Aller et al., 2015; Vazquez et al., 2015): *clinical information coordination*, which refers to the use of patients' clinical information in order to harmonize activities between providers, and consists of two dimensions, transfer of clinical information and its use; and *clinical management coordination*, which refers to the provision of care in a sequential and complementary way by the different services and healthcare levels involved; it encompasses three dimensions, care coherence, follow-up and accessibility across levels of care.

The development of theoretical frameworks to guide the analysis of factors influencing coordination across care levels is limited (Ovretveit, 2011). From the empirical studies on factors that influence coordination, most of which use qualitative methods, two types can be distinguished: a) *organizational factors*, such as the existence of certain types of coordination mechanisms across care levels or having enough time to use them (Andvig et al., 2014; Fleury et al., 2012); and b) *factors related to professionals*, such as values and attitudes towards coordinating care and knowing the professionals of the other care level (Berendsen et al., 2006). *Contextual* or health system factors related to coordination across care levels have scarcely been explored (Vargas et al., 2016).

1.2. Public healthcare subsystems in the study countries

The study countries are classified as high income (Argentina, Chile and Uruguay) and upper middle income (Brazil, Colombia and Mexico), but have large socioeconomic and health inequalities (ChartsBin statistics collector team 2016) and, with the exception of Uruguay (1027$), low levels of public health expenditure per capita: 335$ in Argentina, 436$ in Brazil, 563$ in Chile, 428$ in Colombia, and 351$ in México (OECD, 2014).

Although the models vary, these countries have health systems that are segmented by population groups according to socioeconomic or employment status (Atun et al., 2015; Londoño and Frenk, 1997), with a public subsystem and a private one. The public sector is financed by social security contributions and/or taxes. It encompasses at least one subsystem dependent on the ministry of health, which is decentralized to different levels of government (departments/provinces and/or municipalities) and is generally aimed at the lower income population and/or those without social security. This study is focused on this public subsystem.

The proportion of covered population — estimated from the figures of enrollees in the public subsystem under study or in the other subsystems - varies depending on the country: in Chile (FONASA) and Brazil (SUS) it is high, with 73% and 75% respectively, in Mexico (Health Department/public health insurance) 58.4%, in Uruguay (ASSE) 36%, in Argentina (provincial and municipal health departments) 36%, and in Colombia 53.7%, taking into account that these services provide care for the uninsured population and those enrolled in the subsidized scheme (ANS, 2016; INDEC, 2010; INEGI, 2014; Ministerio de Salud y Protección Social. Colombia, 2015; Ministerio de Salud. Uruguay, 2016).

The public healthcare subsystems in the study countries have significant similarities. They have national policies or programs fostering integrated healthcare networks, with diverse degrees of ambition and specificities (Vazquez et al., 2015). Healthcare provision is organized in networks of providers, mainly public (except in Colombia), but also private (except in Mexico). In all six countries, the norms envisage health care organized by levels of complexity, with PC as the entry point and coordinator of patient care and SC care in a supporting role, requiring a referral from PC for access to the specialist (Giovanella et al., 2015).

2. Methods

2.1. Study design and study areas

A cross-sectional study was carried out based on a survey of doctors in Argentina, Brazil, Chile, Colombia, Mexico and Uruguay. The study area in each country was made up of two public health services networks, selected according to the municipalities or region in which participating universities were located (except for in Uruguay): Argentina, south/southern and north/north-western districts of Rosario; Brazil, Districts III and VII in Recife and the urban area of Caruaru; Chile, the southern and northern networks of Santiago, encompassing three districts; Colombia, south-western

and southern district networks of Bogotá; Mexico, state networks of Xalapa and Veracruz; Uruguay, two networks of the western region, encompassing seven districts. The networks were selected according to the following criteria: a) provision of a continuum of services including at least PC and SC; b) provision of care to a defined population; c) mainly in urban areas of low or medium-low socioeconomic status; d) willingness to participate. None of the contacted networks refused to participate. Since the study networks were not very large, almost all of their health services were included.

2.2. Study population and sample

The study population was made up of PC and SC doctors whose daily practice involve contact with doctors of the other care level (i.e. through the patients' referral process) and who had been working for at least three months in the study network. A sample size of 348 doctors in each country (174 per network) was estimated to ensure the detection of a 15% variation between networks in professionals' experience of care coordination − i.e. with respect to the items on clinical care coordination included in the questionnaire. It was calculated on the basis of 80% power and a confidence level of 95%.

For the selection of survey participants, a list of doctors working in the centre was obtained. Following the presentation of the study to the professionals, the interviewers contacted them and verified that they met the inclusion criteria. Since the total number of doctors in each network was relatively small, all those who fulfilled the criteria were invited to participate. The percentage of contacted doctors that refused to participate ranged from 2.65% in Colombia to 7.6% in Uruguay.

2.3. Questionnaire

A questionnaire was designed to analyze clinical care coordination across levels of care (COORDENA www.equity-la.eu). Based on the conceptual framework of the study (Vazquez et al., 2015), variables were identified for each of the two types of clinical care coordination and their corresponding dimensions. Previous qualitative research was also taken into account (Vargas et al., 2016) and a review was conducted of the scientific literature and existing tools. The content of the questionnaire was then validated through discussions with a multidisciplinary group of experts with good knowledge of care integration and of the study framework and contexts. This first version in Spanish was adapted to the context and language variant of each participating country, and translated into Portuguese in the case of Brazil. In each country, a pre-test was conducted first consisting of cognitive interviews with 5−6 PC and SC doctors, followed by a pilot test, in order to evaluate the rhythm of the interview, interviewer burden and acceptability and comprehensibility. As a result, some questions were modified to avoid unfamiliar terms, or removed to shorten or avoid repetition.

The final questionnaire is divided into eleven sections. The first (the focus of this paper) includes 13 items to measure clinical care coordination across levels of care experienced by doctors: a) clinical information coordination: three items on transfer of information; b) clinical management coordination: four items on care coherence, three items on the follow-up of patients, and two items on accessibility; and c) one item on general perception of clinical care coordination. This is followed by a section on doctors' relational (interactional) factors. Both sections use a Likert scale (always, often, sometimes, rarely, never). The third and fourth sections refer to the knowledge and use of care coordination mechanisms. This is followed by a section on suggestions for improving coordination between levels of care. The penultimate section refers to organizational and employment factors and job-related attitudes, and the final one to demographic characteristics.

2.4. Data collection and quality

Data were collected by means of face-to-face interviews conducted by specifically trained interviewers in each country from May to October 2015 (in Uruguay to May 2016). Strategies to ensure the quality and consistency of data included close supervision of interviewers in the field, a review of all questionnaires, and re-interviewing 20% of participants selected at random. Inconsistencies during data entry were controlled using the double-entry method.

2.5. Variables

Outcome variables for the descriptive analyses were nine items on the clinical coordination experienced. For the analysis of associated factors, the item on perception of care being coordinated across levels of care (always/often) was used because it acts as a good summary measure, since it is related to the most relevant dimensions of care coordination (Supplementary material).

The explanatory variables were: a) *demographic*: sex, age; b) *employment conditions*: care level, years working in the centre, type of contract, contracted hours per week, complementary work in the private sector; c) *organizational conditions*: time per patient, time for clinical coordination; d) *attitude towards the job*: satisfaction with the job, plan to change job in the following 6 months, satisfaction with the salary; and e) *doctors' interactional factors*: identification of PC doctor as coordinator of patient care across levels, knowing doctors of the other care level and trusting in their clinical skills.

2.6. Analysis

Univariate analyses were performed to describe the explanatory variables by country and bivariate analyses to describe the items on clinical care coordination and associated factors by country and level of care. Subsequently, a logistic regression model was generated to test the hypotheses on the possible influence of the different factors (explanatory variables) on general perception of care coordination. Robust covariance adjustments - employing the country variable - were used to account for correlated observations due to clustering. Percentages and adjusted odds ratios (OR) were calculated for perceived high level of care coordination. To reach the final model, the variables were added by group: first, demographic; second, employment conditions; third, organizational; fourth, attitude towards the job; and lastly, doctors' interactional factors. In cases where none of the variables in a group were significant, at least one was left in. This allowed us to ascertain the impact of different types of variables on adjusting the model.

Multicollinearity between explanatory variables was tested using the variance inflation factor (VIF), which was found to be insignificant (VIF values fall below 1.5). Model fit was assessed with the Hosmer−Lemeshow goodness-of-fit test. The regression model gave p-values higher than 0.05, indicating that the model estimates fit the data at an acceptable level. Statistical analyses were performed using Data Analysis and Statistical Software (STATA), version 12.

2.7. Ethical considerations

Ethical approval was obtained from the ethical committees in the participating countries. All interviewees participated on a voluntary basis, after signing an informed consent. The right to

refuse to participate or withdraw from the survey, anonymity, confidentiality and protection of data were all guaranteed.

3. Results

3.1. Characteristics of the sample

Firstly, in terms of noteworthy demographic characteristics, the highest proportion of young doctors was found in the Colombian sample (52.1%) and of doctors over 50 years of age in Mexico (51.5%); the remaining samples showed a similar distribution. Secondly, there is a majority of women in Argentina (69.7%) and men in Colombia (65.3%), while the rest are more or less balanced. In Argentina, Mexico and Uruguay, the majority of doctors have been working in their centers for more than three years, whilst in Brazil, and in Chile and Colombia in particular, there is a higher proportion of doctors with less than one year's experience. The highest number of contracted working hours per week for doctors (from 20 to more than 40) is found in Chile and Colombia, whereas in Brazil and Uruguay about half of them are contracted for under 20 h. A notable proportion of doctors complement their jobs with work in private health services, with high percentages in Brazil (55.4%) and Chile (57.5%) and very high in Uruguay (87.1%). With regard to organizational aspects, doctors in Colombia and Mexico have more time per patient, but in all six countries they consider that the time available for clinical coordination is insufficient (more than 80% in Chile and Colombia) (Table 1).

In terms of attitudes towards the job, the majority of doctors in all six countries are satisfied, although somewhat less so in SC in Brazil (53.7%), and have no plans to change jobs, apart for some PC doctors in Colombia (25.4%). However, with the exception of PC doctors in Mexico, the majority is not satisfied with the salary, especially SC doctors, and those of both levels in Uruguay. Finally, with respect to interactional factors, most PC doctors in all the countries identify themselves as coordinator for the patients in their trajectory through the different care levels, but only a minority of SC doctors recognize this, except in Argentina (62.7%). Less than 20% of doctors claimed to know the professionals of the other care level personally, except in Argentina (32.6%) and particularly in Uruguay (72.0%). More than half report that they trust in the clinical skills of doctors in the other level, with higher percentages in Argentina (76.0%) and Uruguay (81.9%), and with differences between care levels: the percentage is lower among SC doctors, especially in Chile and Mexico (only 40%) (Table 2).

3.2. Doctors' experience of clinical information and management coordination between levels

With respect to *clinical information coordination between levels*, the exchange of information is low in all six countries, but particularly so in Brazil (19.4%), Chile (10.3%) and Mexico (14.5%), with differences according to care level: PC doctors indicate a lower level of exchange. However, the doctors that claim to exchange information report that the data recorded is necessary and that they take it into account when attending to the patient (Table 3).

With regard to *clinical management coordination between levels*,

Table 1
Demographic, employment and organizational characteristics of study sample.

	Argentina (n = 350)	Brazil (n = 381)	Chile (n = 348)	Colombia (n = 363)	Mexico (n = 365)	Uruguay (n = 332)
	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)
Sex						
Male	106 (30.3)	161 (42.3)	182 (52.3)	237 (65.3)	202 (55.3)	151 (45.6)
Female	244 (69.7)	220 (57.7)	166 (47.7)	126 (34.7)	163 (44.7)	180 (54.2)
Age						
24–35 years	78 (22.3)	104 (27.3)	133 (38.2)	189 (52.1)	38 (10.4)	59 (17.8)
36 a 50 years	160 (45.7)	155 (40.7)	126 (36.2)	94 (25.9)	139 (38.1)	153 (46.1)
> 50 years	112 (32.0)	118 (31.0)	89 (25.6)	78 (21.5)	188 (51.5)	114 (34.3)
Care level						
Primary care	157 (44.9)	109 (28.6)	141 (40.5)	118 (32.5)	156 (42.7)	101 (30.4)
Secondary care	193 (55.1)	272 (71.4)	207 (59.5)	245 (67.5)	209 (57.3)	221 (66.6)
Years working in the centre/workplace						
Less than 1 year	47 (13.4)	73 (19.2)	117 (33.6)	120 (33.1)	27 (7.4)	29 (8.7)
From 1 to 3 years	61 (17.4)	112 (29.4)	61 (17.5)	98 (27.0)	40 (11.0)	52 (15.7)
More than 3 years	242 (69.1)	196 (51.4)	170 (48.9)	145 (39.9)	298 (81.6)	247 (74.4)
Type of contract						
Stable	267 (77.0)	292 (76.6)	129 (37.7)	73 (20.5)	295 (81.0)	250 (75.3)
Temporary	80 (23.1)	89 (23.4)	213 (62.3)	283 (79.5)	69 (19.0)	72 (21.7)
Contracted hours per week						
< 20 h	54 (15.4)	165 (43.3)	34 (9.8)	41 (11.3)	2 (0.6)	179 (53.9)
20–40 h	279 (79.7)	187 (49.1)	173 (49.7)	119 (32.8)	351 (96.2)	110 (33.1)
> 40 h	17 (4.9)	29 (7.6)	141 (40.5)	203 (55.9)	12 (3.3)	31 (9.3)
Additional work in private sector						
Yes	119 (34.0)	211 (55.4)	200 (57.5)	131 (36.1)	178 (48.8)	289 (87.1)
No	231 (66.0)	170 (44.6)	148 (42.5)	230 (63.4)	186 (51.0)	38 (11.5)
Time per patient						
Primary care						
< 15 min	68 (43.3)	54 (49.5)	103 (73.1)	6 (5.1)	9 (5.8)	83 (82.2)
> 15 min	89 (56.7)	55 (50.5)	38 (27.0)	112 (94.9)	145 (94.2)	15 (14.9)
Secondary care						
< 15 min	102 (52.8)	215 (79.3)	123 (60.0)	75 (31.1)	37 (19.2)	163 (73.8)
> 15 min	64 (33.2)	56 (20.7)	82 (40.0)	166 (68.9)	156 (80.8)	44 (19.9)
Enough consultation time dedicated to clinical coordination [a]						
Yes	107 (30.6)	139 (36.5)	49 (14.1)	61 (16.8)	95 (26.0)	128 (38.6)
No	234 (66.9)	236 (61.9)	298 (85.6)	302 (83.2)	259 (71.0)	180 (54.2)

[a] Yes: always, often; No: sometimes, rarely, never.

Table 2
Doctors' attitude towards the job and interactional factors.

	Argentina (n = 350)	Brazil (n = 381)	Chile (n = 348)	Colombia (n = 363)	México (n = 365)	Uruguay (n = 320)
	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)
Satisfaction with the job [a]						
Primary care	117 (74.5)	87 (79.8)	119 (84.4)	104 (88.1)	149 (95.5)	75 (74.3)
Secondary care	145 (75.1)	146 (53.7)	166 (80.2)	206 (84.1)	193 (92.3)	178 (80.5)
Total	262 (74.9)	233 (61.2)	285 (81.9)	310 (85.4)	342 (93.7)	261 (78.6)
Plans to change jobs in next six months [a]						
Primary care	11 (7.0)	10 (9.2)	11 (7.8)	30 (25.4)	5 (3.2)	7 (6.9)
Secondary care	21 (10.9)	30 (11.0)	18 (8.7)	35 (14.3)	5 (2.4)	19 (8.6)
Total	32 (9.1)	40 (10.5)	29 (8.3)	65 (17.9)	10 (2.7)	27 (8.1)
Satisfaction with the salary [a]						
Primary care	65 (41.4)	49 (45)	72 (51.1)	56 (47.5)	101 (64.7)	28 (27.7)
Secondary care	53 (27.5)	33 (12.1)	51 (24.6)	108 (44.1)	72 (34.5)	79 (35.8)
Total	118 (33.7)	82 (21.5)	123 (35.3)	164 (45.2)	173 (47.4)	108 (32.5)
Identifies PC doctor as coordinator of patient care across care levels [b]						
Primary care	134 (85.3)	90 (82.6)	107 (75.9)	82 (69.5)	137 (87.8)	71 (70.3)
Secondary care	121 (62.7)	112 (41.2)	89 (43.0)	107 (43.7)	58 (27.7)	94 (42.5)
Total	255 (72.9)	202 (53.0)	196 (59.3)	189 (52.1)	195 (53.4)	172 (51.8)
Knows doctors of the other care level [b]						
Primary care	49 (31.2)	13 (11.9)	14 (9.9)	9 (7.6)	18 (11.5)	66 (65.4)
Secondary care	65 (33.7)	29 (10.7)	19 (9.2)	17 (6.9)	24 (11.5)	166 (75.1)
Total	114 (32.6)	42 (11.0)	33 (9.5)	26 (7.2)	42 (11.5)	239 (72.0)
Trusts in the clinical skills of doctors of the other care level [b]						
Primary care	127 (80.9)	74 (67.9)	118 (83.7)	98 (83.0)	123 (78.8)	91 (90.1)
Secondary care	139 (72.0)	123 (45.2)	64 (30.9)	106 (43.3)	59 (28.2)	172 (77.8)
Total	266 (76.0)	197 (51.7)	182 (52.3)	204 (56.2)	182 (49.9)	272 (81.9)

[a] Categories were grouped into: yes = totally agree and agree; No = neither agree or disagree, disagree, totally disagree. Here the results for the first category (yes) are shown.
[b] Categories were grouped into; yes = always and often; No = sometimes, rarely, never. Here the results for the first category (yes) are shown.

Table 3
Primary and secondary care doctors' experience of high coordination of information between levels of care.

	Argentina (n = 350)	Brazil (n = 381)	Chile (n = 348)	Colombia (n = 363)	Mexico (n = 365)	Uruguay (n = 332)
	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)
PC and SC doctors exchange clinical information (diagnoses, tests, treatments) on the patients we attend [a]						
PC doctors	53 (33.8)	17 (15.6)	8 (5.7)	24 (20.3)	15 (9.6)	30 (29.7)
SC doctors	76 (39.4)	57 (21.0)	28 (13.5)	135 (55.1)	38 (18.2)	109 (49.3)
Total	129 (36.9)	74 (19.4)	36 (10.3)	159 (43.8)	53 (14.5)	145 (43.7)

	Argentina (n = 336)	Brazil (n = 288)	Chile (n = 263)	Colombia (n = 316)	Mexico (n = 200)	Uruguay (n = 176)
The information received is as required for the care of the patient [a]						
PC doctors	115 (75.2)	65 (78.3)	67 (59.3)	49 (53.9)	61 (73.5)	73 (75.3)
SC doctors	135 (73.8)	154 (75.1)	96 (64.0)	175 (77.8)	72 (61.5)	161 (74.5)
Total	250 (74.4)	219 (76.1)	163 (62.0)	224 (70.9)	133 (66.5)	241 (74.8)
PC doctors and SC doctors take the information we exchange into account in the care of the patient [a]						
PC doctors	109 (71.2)	63 (75.9)	67 (59.3)	56 (61.5)	52 (62.7)	79 (81.4)
SC doctors	146 (79.8)	162 (79.0)	88 (58.7)	191 (84.9)	72 (61.5)	195 (90.3)
Total	255 (75.9)	225 (78.1)	155 (58.9)	247 (78.2)	124 (62.0)	283 (87.9)

[a] Results correspond to the categories *always* and *often*.

the rating of consistency of care between levels is generally higher (Table 4), with differences according to level. PC doctors experience it in all four attributes (no repetition of tests; agreement over treatment; no contradictions; appropriate referrals) (Table 4). However, the proportion of SC doctors that report agreement over treatments is low, particularly in Chile (21.3%), Colombia (33.1%) and Mexico (11.5%), as is the proportion of those who consider that the referrals are necessary (i.e. clinically appropriate) in Argentina (55.7%), Chile (50.2%) and especially Mexico (37.8%) (Table 4). With regard to the follow-up of patients across levels, a little more than half of the informants report that SC doctors refer the patients back to the PC doctor for follow-up. However, the

proportion is lower among SC doctors in Chile (47.3%) and Uruguay (40.3%) and doctors of both levels in Colombia (48.3% and 27.4%) (Table 4). Doctors from both care levels, but to a greater degree those from PC and more markedly in Brazil and Colombia, point out that SC doctors do not make recommendations to PC for the follow-up of the patient. Similarly, the proportion of doctors from both care levels who report that PC doctors consult SC doctors with any queries is also low, especially in Brazil (15.0%), Chile (12.1%) and Mexico (9.0%).

Finally, in terms of accessibility between care levels, doctors of both levels consider that the patient waits a long time for an appointment with the specialist after a referral from PC, especially

Table 4
Primary and secondary care doctors' experience of high coordination of clinical management between levels of care, by study area.

	Argentina (n = 350)	Brazil (n = 381)	Chile (n = 348)	Colombia (n = 363)	Mexico (n = 365)	Uruguay (n = 179)
	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)
Consistency of care between levels						
Doctors do not request the repetition of tests that have already been performed at other care levels [a]						
PC doctors	145 (92.4)	96 (88.1)	120 (85.1)	100 (84.8)	139 (89.1)	88 (87.1)
SC doctors	154 (79.8)	215 (79.0)	127 (61.4)	143 (58.4)	139 (66.5)	189 (85.5)
Total	299 (85.4)	311 (81.6)	247 (71.0)	243 (66.9)	278 (76.2)	285 (85.8)
Doctors are in agreement over the treatments prescribed or indicated by doctors of other care levels [a]						
PC doctors	113 (72.0)	76 (69.7)	125 (88.7)	74 (62.7)	105 (67.3)	51 (50.5)
SC doctors	77 (39.9)	94 (34.6)	44 (21.3)	81 (33.1)	24 (11.5)	87 (39.4)
Total	190 (54.3)	170 (44.6)	169 (48.6)	155 (42.7)	129 (35.3)	145 (43.7)
There are no contradictions and/or duplications in the treatments that PC and SC doctors prescribe [a]						
PC doctors	132 (84.1)	87 (79.8)	117 (83.0)	88 (74.6)	134 (85.9)	86 (85.2)
SC doctors	155 (80.3)	202 (74.3)	164 (79.2)	180 (73.5)	163 (78.0)	165 (74.7)
Total	287 (82.0)	289 (75.9)	281 (80.8)	268 (73.8)	297 (81.4)	259 (78.0)
PC doctors refer patients to specialists when it is necessary [a]						
PC doctors	143 (91.1)	95 (87.2)	125 (88.7)	114 (96.6)	154 (98.7)	90 (89.1)
SC doctors	107 (55.7)	188 (69.1)	104 (50.2)	180 (73.5)	79 (37.8)	162 (73.3)
Total	251 (71.7)	283 (74.3)	229 (65.8)	294 (81.0)	233 (63.8)	261 (78.6)
Adequate follow-up between levels						
The specialists refer patients back to the PC doctor for follow-up [a]						
PC doctors	111 (70.7)	72 (66.1)	99 (70.2)	57 (48.3)	94 (60.3)	53 (52.5)
SC doctors	131 (67.9)	165 (60.7)	98 (47.3)	67 (27.4)	109 (52.2)	89 (40.3)
Total	242 (69.1)	237 (62.2)	197 (56.6)	124 (34.2)	203 (55.6)	150 (45.2)
The specialists make recommendations to the PC doctor on diagnosis, treatment and other aspects for follow-up of the patient [a]						
PC doctors	52 (33.1)	16 (14.7)	43 (30.5)	18 (15.3)	42 (26.9)	37 (36.6)
SC doctors	127 (65.8)	85 (31.3)	106 (51.2)	122 (49.8)	126 (60.3)	118 (53.4)
Total	179 (51.1)	101 (26.5)	149 (42.9)	140 (38.6)	168 (46.0)	160 (48.2)
PC doctors consult the specialists with any queries they have about following up the patient [a]						
PC doctors	79 (50.3)	18 (16.5)	23 (16.3)	23 (19.5)	10 (6.4)	65 (64.4)
SC doctors	95 (49.2)	39 (14.3)	19 (9.2)	146 (59.6)	23 (11.0)	116 (52.5)
Total	174 (49.7)	57 (15.0)	42 (12.1)	169 (46.6)	33 (9.0)	189 (56.9)
Accessibility						
When the patient is referred to the specialist, they don't have to wait long for an appointment [a]						
PC doctors	34 (21.7)	21 (19.3)	9 (6.4)	8 (6.8)	31 (19.9)	26 (25.7)
SC doctors	63 (32.7)	35 (12.9)	54 (26.1)	56 (22.9)	94 (45)	85 (38.5)
Total	97 (27.7)	56 (14.7)	63 (18.1)	64 (17.6)	125 (34.3)	113 (34.0)
After consultation with the specialist, when the patient requests to see the PC doctor, they don't have to wait long for an appointment [a]						
PC doctors	141 (89.8)	101 (92.7)	129 (91.5)	93 (78.8)	148 (94.9)	75 (74.3)
SC doctors [b]	103 (53.4)	80 (29.4)	72 (34.8)	115 (46.9)	56 (26.8)	102 (46.2)
Total	244 (69.7)	181 (47.5)	201 (57.8)	208 (57.3)	204 (55.9)	184 (55.4)

[a] Results correspond to the categories *always* and *often*.
[b] The percentages of the non-response category are: 25.4 (Argentina); 29.4 (Brazil); 42.0 (Chile); 22.0 (Colombia); 56.5 (Mexico); 32.6 (Uruguay).

in Brazil, Chile and Colombia. Regarding waiting times for follow-up appointments in PC after a visit to SC, most PC doctors report that the patient does not have to wait very long but far fewer SC doctors report this, particularly in Brazil (29.4%), Chile (34.8%) and Mexico (26.8%). The proportion of SC doctors who do not answer this item is very high.

3.3. Perception of good coordination between levels and associated factors

To analyze the factors associated with coordination between levels in the study networks, a summary item is used: "*I think that the care provided is coordinated between the primary care doctors and the specialists in the network*". In general, doctors of all the study areas perceived limited coordination between levels (Fig. 1), particularly in Brazil, Chile and Mexico.

Several factors in the different categories of explanatory variables studied are associated with a better perception of coordination. In the category of employment conditions, the care level is associated (i.e. being a SC doctor). In terms of organizational conditions, believing there is enough time available for coordination within consultation hours positively influences doctors' perceptions of coordination. As regards their attitude towards the job, being satisfied with the job and the salary also influences their opinions on coordination. Lastly, in interactional terms, identifying the PC doctor as the coordinator of patient care, knowing the doctors from the other level and trusting in their clinical skills are all factors associated with a more positive view of coordination (Table 5).

4. Discussion

This study is the first attempt to comparatively analyze one of the priority areas for improving the quality of health care in Latin
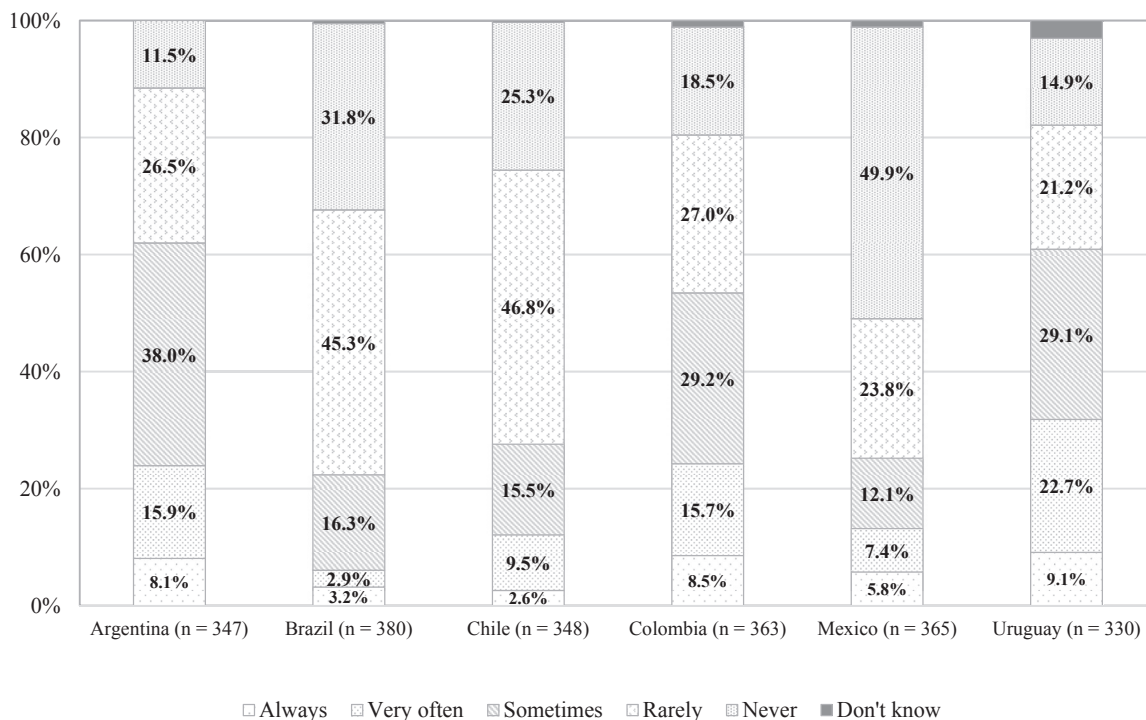
Fig. 1. Distribution of doctors' perception of coordination of care provided in the study networks, by country.

Table 5
Factors associated with perception of high care coordination between levels.

Factors	n (%)	Unadj. OR	Adj. OR (CI 95%)
Sex			
Male	193 (18.8)	1	1
Female	195 (18.0)	0.95 (0.80–1.13)	1.08 (0.80–1.47)
Age			
24–35 years	86 (14.6)	1	1
36 a 50 years	143 (17.5)	1.25 (0.66–2.34)	1.26 (0.72–2.21)
> 50 years	158 (22.8)	1.74 (0.93–3.25)	1.66 (0.95–2.90)
Care level			
Primary care	124 (15.9)	1	**1**
Secondary care	261 (19.7)	1.30 (0.96–1.75)	**1.89 (1.55–2.32)**
Type of contract			
Temporary	140 (17.5)	1	1
Stable	244 (19.0)	1.11 (0.55–2.22)	0.99 (0.74–1.33)
Contracted hours per week			
< 20 h	98 (21.1)	1	1
20–40 h	211 (17.5)	0.79 (0.40–1.55)	0.99 (0.64–1.53)
> 40 h	75 (17.5)	0.79 (0.33–1.88)	0.72 (0.40–1.29)
Enough consultation time dedicated to clinical coordination			
No	243 (16.3)	1	**1**
Yes	141 (24.8)	**1.70 (1.06–2.72)**	**1.41 (1.04–1.89)**
Satisfaction with salary			
No	212 (15.9)		1
Yes	175 (23.2)	**1.60 (1.20–2.11)**	**1.42 (1.13–1.79)**
Satisfaction with job			
No	44 (10.3)	1	1
Yes	343 (20.5)	**2.25 (1.46–3.47)**	**1.70 (1.41–2.04)**
Identifies PC doctor as coordinator of patient care across care levels			
No	125 (14.6)	1	1
Yes	253 (21.0)	**1.55 (1.15–2.10)**	**1.51 (1.12–2.04)**
Knows doctors of the other care level			
No	220 (15.1)	1	1
Yes	151 (30.9)	**2.50 (1.60–4.00)**	**1.44 (1.08–1.91)**
Trusts in clinical skills of doctors of the other care level			
No	73 (9.5)	1	1
Yes	315 (24.3)	**3.08 (1.70–5.60)**	**2.51 (1.77–3.54)**

Adj-OR: odds ratio adjusted for all variables jointly including the country variable. CI: confidence interval; Unadj. OR: unadjusted odds ratio.
Statistically significant OR are shown in bold. CI was calculated at 95% significance.

America: coordination across care levels. It is based on a survey of doctors and uses a common tool to comprehensively measure their experience of this multidimensional phenomenon and to explore individual and organizational factors that may contribute to it, both little explored in scientific research, even in the international context (Ovretveit, 2011). Although the study was conducted in two public health services networks in each country, and one should be cautious in generalizing the results, it allows us to identify critical elements in clinical coordination.

In all the networks studied, doctors report limited coordination of clinical care, especially in terms of information exchange and, to a lesser degree, clinical management, with differences between levels: for PC doctors it was more related to a lack of information and communication for the follow-up of patients and access to SC for referred patients, and for SC doctors, to a lack of information in referrals, clinically inappropriate referrals and disagreement over treatments. These results highlight faults in coordination between levels and a limited implementation of a model promoted since the Alma-Ata Declaration and revitalized by the care integration policies of the last decade, in which primary care plays the role of care coordinator in the network.

4.1. Limited information exchange and inconsistencies in care, especially in follow-up between levels

In the networks of all six countries, and particularly in Brazil, Chile and Mexico, the worst rated attributes of coordination were the exchange of information and communication between levels for the follow-up of the patient. This result is consistent with the deficient use (low, late and of poor quality) of the main mechanism, the (counter)referral form, especially on the part of SC doctors, as this and other studies indicate, and with the lack of other formal channels of communication between doctors of different levels (Vargas et al., 2015). Likewise, the higher rating given by doctors in the networks of Argentina, Colombia and Uruguay may be due to a better use of the form, and also to more communication by telephone for urgent cases in Colombia, the assignment of health centers to referral teams for certain specialties in Argentina, and the direct contact permitted by the co-location of PC and SC doctors in polyclinics in Uruguay. Therefore, in all countries, the results suggest in line with the evidence, that complex strategies should be implemented to improve the transfer of information and communication (Vermeir et al., 2015). Moreover, addressing factors such as lack of time and interest, precarious working conditions or economic disincentives to collaborate, which hinder the use of existing and potentially new mechanisms might be necessary, as some previous qualitative studies pointed out (Vargas et al., 2015).

Although their experience of clinical management coordination is more positive, in all the networks doctors reported disagreements over treatments and inappropriate referrals to SC, mainly in Chile and Mexico, and a low rate of counter-referral of patients to PC for follow-up, especially in Chile, Colombia and Uruguay. These results may indicate quality-related problems in PC, due to insufficient training (Giovanella et al., 2015), restrictions on the diagnostic tests and drugs that can be requested and shortfalls in physical and human resources. However they may also be due to long waiting times for SC, which delay the diagnosis and adequate treatment of patients in PC.

Moreover, the fact that it is mainly SC doctors pointing out these inconsistencies may simply reflect a limited understanding of the gatekeeper role of PC: for example, the probability that a referred patient will not require specialist care even when the referral was justified (incorrectly called *"unnecessary referrals"*) is high because the negative predictive value of the diagnostic process of a PC doctor is high (Grundmeijer, 1996). It may also reflect a failure to recognize their own role in the follow-up of patients (Forrest, 2009). This would also explain the considerable percentage of specialists, particularly in Chile, Colombia and Uruguay, who indicated that they occasionally or never counter-referred patients, thus hindering their follow-up in PC. In Colombia, with the lowest rate of counter-referral of patients to PC, this may also be related to the fee-for-service payment of specialists, which incentivizes them to retain patients.

It should be stressed that a significant shortcoming in the coordination of patient follow-up between levels is the long waiting times for SC, a result consistent with other studies, not only for consultations but also diagnostic tests (Garcia-Subirats et al., 2014). This once again highlights the limited access of the population to health care that is adequate to its needs.

4.2. The importance of attitude-related factors in doctors' perception of coordination

In addition to working in SC, other factors are associated with a better perception of coordination: having enough time available to coordinate, interactional factors (identifying the PC doctor as coordinator of patient care across levels, knowing doctors personally and trusting in their skills), and satisfaction with the job and salary.

The association found between care level and perception of coordination seems to corroborate the assertion that the two types of professionals experience the same phenomenon differently, as previous studies have pointed out (Vargas et al., 2015). Furthermore, the results show the importance of having enough time to coordinate with other care levels, in keeping with studies conducted in other settings (Fleury et al., 2012), and highlight the fact that creating the adequate conditions for the use of coordination mechanisms is just as important as implementing them, aspects which are not always taken into account by managers and policymakers (Vargas et al., 2015).

The results would also seem to indicate that SC and PC doctors who acknowledge the role of PC as care coordinator attribute more importance to collaboration between levels. This would be consistent with Fussell and Krauss (1992) and the relational coordination theory (Gittell, 2011) that highlight *"mutual or shared knowledge"* as a key aspect for coordination. In other words, understanding that tasks are interdependent and that the actions of one affect the rest underlies the effective coordination of work (Gittell, 2011).

Knowing the professionals from the other care level personally also strengthens *"mutual knowledge"*, as it allows them to share experiences and learn about each other's environment and skills. This may be even more relevant in contexts in which the roles of PC and SC doctors are not well defined. However, apart from the Uruguay networks, and to a lesser degree in Argentina, the results show that few professionals know each other, which is explained by the almost complete lack of mechanisms to favor direct contact. Moreover, the fact that fewer doctors know each other in Chile and Colombia may be related to the high turnover of professionals (temporary contracts 62.3% and 79.5% respectively) and in Colombia, also of providers, due to the short-term contracts that insurers sign with them (Vargas et al., 2016). In contrast, the greater familiarity reported in Uruguay could be a result of the co-location of SC and PC doctors and the smaller size of the networks.

Trusting the skills of doctors of the other level is associated with the perception of coordination of care, which is consistent with previous studies (D'Amour et al., 2005). Trust is associated to another key aspect for coordination, "mutual respect" (Gittell, 2011) that increases the likelihood that professionals will be receptive to communication from their colleagues in other care levels. However,

the results also reveal low levels of trust among SC doctors, especially in Mexico and Chile. Although further research is required, this may be due to having directly observed actions that they considered inadequate, but also to prejudices regarding the performance of PC doctors. Lastly, satisfaction with the job influences perceptions of coordination, an association which, like the others mentioned above, can be argued both ways: the most satisfied individuals are more motivated to do a good job (Nantha, 2013) and are therefore more willing to communicate with the other levels (Vargas et al., 2016), and vice-versa, those individuals that work in a more coordinated way and/or in an environment that favors coordination (time to coordinate, mechanisms) are more satisfied with their jobs (Gittell et al., 2008). Although further research is required, the low levels of satisfaction with the salary might be related to the dissatisfaction of professionals with working conditions that are insecure, imposed or voluntary — low-hours contracts, multi-employment, high job turnover, etc. — which contribute to them seeing the care of a patient as an isolated act and attributing less importance to coordinating to provide quality care (Vargas et al., 2016).

4.3. Limitations of the study

The cross-sectional design allowed us to identify associations but not to determine causality. There is a strong need for longitudinal studies on the effects of individual and organizational factors on clinical care coordination. We were unable to explore associations with other types of organizational factors through a multilevel analysis, which would require a larger sample of networks. Finally, further studies are required to compare our results, which are based on self-reported clinical care coordination, with other information sources, e.g. clinical records.

5. Conclusion

The results indicate that doctors in all the study networks reported limited clinical coordination, especially in terms of information exchange, but also clinical management, and that this was associated with various factors related to working conditions, interaction and attitude. Both results highlight the limited implementation of a model based on primary care as coordinator, with some differences between contexts.

Certain recommendations can be inferred from the results regarding necessary changes to address key aspects in the health services networks. These include the definition and diffusion of the roles of each care level through medical training, and the implementation of feedback mechanisms which, in addition to improving consistency of care, patient follow-up and quality of care, favor mutual knowledge and trust between doctors of different care levels, a recommendation that is especially relevant for SC. Reducing SC waiting times, together with improving the quality of primary care, are key factors for improving the follow-up of patients across levels. Finally, it should not be forgotten that the right working conditions must be created — enough time, stability — for doctors to use the mechanisms correctly, be willing to coordinate and create ongoing relationships with professionals of the other levels.

Appendix A. Supplementary data

Supplementary data related to this article can be found at http://dx.doi.org/10.1016/j.socscimed.2017.04.001.

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