Social capital and malnutrition among indigenous children under 5 years of age in the province of Chimborazo.

Lino Patricio Guamán Yupangui *[1] María Fernanda Rivadeneira Guerrero, PhD[1],
Ana Lucía Moncayo Benalcazar, PhD[3], José Cóndor[2], Fabricio Astudillo[4], Janett Buitrón[5], Betzabé Tello[6], Ana L. Torres[2].

https://orcid.org/0000-0002-7525-1600
https://orcid.org/0000-0003-3592-7503
https://orcid.org/0000-0002-1456-0995
https://orcid.org/0000-0003-3109-5674
https://orcid.org/0000-0002-0581-8448
https://orcid.org/0000-0001-5890-6436
https://orcid.org/0000-0001-6702-9383

1. Pediatrics postgraduate departament, Faculty of Medicine, Pontificia Universidad Católica del Ecuador.
2. Faculty of Medicine, Institute of Public Health. Pontificia Universidad Católica del Ecuador.
3. Center for Health Research in Latin America (CISeAL), Faculty of Exact and Natural Sciences, Pontificia Universidad Católica del Ecuador.
4. Faculty of Human Sciences, Geography. Pontificia Universidad Católica del Ecuador.
5. Faculty of Exact and Natural Sciences, Mathematics. Pontificia Universidad Católica del Ecuador.
6. Faculty of Medicine, Family Medicine. Pontificia Universidad Católica del Ecuador.

STROBE Statement

Abstract

Introduction: Social capital (SC) includes several components of social organization, which could improve health; however, there is little information on its association with chronic malnutrition (CM).

Methodology: This cross-sectional analytical study was carried out in the cantons of Riobamba, Alausí, Guamote, Guano, and Colta in 2018-2019. In a probabilistic sample of mothers/caregivers, we collect data related to SC, health determinants, and anthropometric measurements. We performed bivariate and multivariate regression to calculate the odds ratio with 95% confidence interval using SPSS (version 25.0). A P value of less than 0.05 was considered significant.

Results: Our sample included 1228 children, 50.5% (n = 620) male and 49.5% (n = 680) female. Of these, 52.6% (n = 326) of the males and 46.7% (n = 284) of the females had CM. There was a higher probability of CM in children with parents who had not heard of child malnutrition (OR = 1.46; 95% CI = 1.13-1.9). This association remained significant after adjusting for sex, age of the child, number of children, and income.

Conclusions: The association between SC and CM in indigenous children under 5 years of age in the province of Chimborazo was observed in the lack of information on child nutrition.

Keywords: Social capital, Malnutrition, Population Groups, Child Development; Child Preschool.

Introduction

Biological determinants, as well as environmental and social influences, have a considerable impact on the physical, psychological, and mental well-being of children [1]. The environment that surrounds a child before the age of five, both family and community, is a determining factor for their growth and development [2, 3]. One of the characteristics that influences the development potential of a community and that would be associated with health is "social capital" (SC). In recent years, the concept of SC has been used to examine the inequality in access to economic resources, which has important implications in the field of public health [4].

There are several definitions of SC. Bourdieu affirms that it is the set of real or potential resources that are linked to the possession of a lasting network of more or less institutionalized relationships of mutual knowledge or recognition. However, Coleman emphasizes the elements of the social structure that facilitate certain actions of the actors within said structure. For Putnam et al., the concept of SC encompasses certain elements of social organization, such as trust, norms and social networks that can improve the efficiency of society by facilitating coordinated action. Beyond the variety of concepts, there is a certain consensus in considering that it is an intangible and dynamic resource that exists in the collective and encompasses elements such as trust, participation and reciprocity [5].

Other definitions include social cohesion as part of SC. This characteristic causally links the mechanisms of integration and well-being with the full social belonging of individuals [6]. Communities with higher SC have higher life expectancy and better perception of health with low rates of morbidity and mortality from general and specific causes; even after adjusting for socioeconomic, educational, and other variables [7].

Four analytical levels have been identified in the association between SC and health: macro, meso, micro, and individual psychological levels [8, 9]. There is considerable evidence for an association between SC and various health indicators. The lack of family, community, and school SC in children affects their mental health, increasing their susceptibility to depression [10, 11]. Subjective life satisfaction and good health are determined by economic well-being and SC [4, 12]. SC at the community level refers to how individuals who live in a territory participate in organizations and have trust among their members. The probability of being in good health increases when there is a better level of community SC [13-15].

In Ecuador, in 2012, the participation of community organizations decreased from 19% to 8.95%, which contrasts with the fact that one of the most dynamic indigenous movements on the continent is in this country [16, 17]. Multidimensional poverty in rural areas it is 67.7% and multidimensional extreme poverty affects 39.9%; in Chimborazo, multidimensional poverty corresponds to 65.9%, which is above the national average, being one of the most powerful provinces in the country [18, 19].

The indigenous peoples of Ecuador extend over a vast territory of the inter-Andean alley. The Andean or Sierra region concentrates 68.2% of the country's indigenous population, of which 18.5% live in the province of Chimborazo [20, 21]. According to the National Health and Nutrition Survey ENSANUT-EC carried out between 2011 and 2012, with regard to chronic malnutrition (CM) or stunting/poor growth, Ecuador has maintained a modest decrease over almost a quarter of a century (40.2% in 1986 to 25.3% in 2012). Chimborazo is the province with the highest prevalence of CM, affecting 42% of indigenous children under 60 months [22]. Accounting for this, our study focused on identifying the association between SC and malnutrition in the indigenous population under 5 years of age in five cantons of the province of Chimborazo.

Materials and methods

Study design

This is an observational, analytical study.

Stage

The study was carried out at the Faculty of Medicine of the Pontifical Catholic University of Ecuador. The field study was carried out in the cantons: Riobamba, Alausí, Guamote, Guano and Colta (Chimborazo, Ecuador). The study period was from January 1-November 1, 2018 to April 30, 2019. The field period was the data collection period. Data analysis ended on November 12, 2019.

Participants

The study population was children under 5 years of age, without physical disabilities or illness during the last week of the evaluation, with a caregiver who did not have an intellectual disability that would prevent answering the questionnaire. Caregivers who did not want to participate in the study were excluded.

Variables

Demographic variables were recorded: age, sex, residence, age of the mother; variables to assess malnutrition, type of diet such as breastfeeding, presence of infectious diseases, social capital, access to health services and socioeconomic status.

Data/Measurement Sources

Validated questionnaires were used to measure the variables and a survey was applied. The nutrition variable included weight, height, and the calculation of the z value and its standard deviations using the WHO Anthro 3.22 Software [22, 23]. A 28-question questionnaire was used for nutritional diagnosis and health determinants based on the questionnaire applied by the National Health and Nutrition Survey (ENSANUT) (National Institute of Statistics and Censuses) [22] and the United Nations Children's Fund Multiple Indicator Cluster (MIC) Questionnaire [19]. To assess social capital, the World Bank questionnaire was used under three parameters: trust and solidarity, information and communication, and social cohesion [20, 24].

Weight measurement

For weight measurement in children <2 years, the Seca brand series 725 mechanical pediatric scale was used. For children 2 years and older, the ADE brand scale M320600 series was used. To measure height in children <2 years, the portable infantometer brand Seca series 417 was used, and for children older than 2 years, the portable height rod brand Seca series 213 was used. This equipment was calibrated prior to taking the measurements. The anthropometric measurement was carried out according to the interviewer's manual prepared for data collection based on the WHO recommendations [25].

Control of sources of bias

A registry of the schools, child development centers, and community leaders of the cantons included in the study was established. Once the data collection date was agreed upon, the field research team recruited the children to be included. A roadmap was applied starting with informed consent, the application of eligibility criteria, the survey, then collection of anthropometric measurements and laboratory samples.

Study size

The sampling was probabilistic. The sample for this study was 1148 children under 5 years of age. This was calculated based on the population size (14054 indigenous children from rural areas of the four cantons according to the 2010 National Census), for an expected percentage of childhood CM in indigenous people of 42.34% [16] with a confidence level of 95% and an error of 3%. The prevalence of CM was used to calculate the sample because it maximizes the size of the sample, considering that the prevalence of overweight/obesity in the population aged 0-5 years in the province of Chimborazo is 9.1% [18].

Statistical Methods

The data obtained were entered in the Epi Info version 7.2 program using double typing for data validation and were processed in the SPSS version 25 analytical program. For qualitative variables, frequencies and percentages were calculated. For the quantitative variables, measures of trend (mean, median, mode, minimum and maximum), and dispersion (standard deviation, interquartile range) were calculated. Data analysis to associate malnutrition with SC was performed using bivariate and multivariate logistic regression, with the calculation of odds and 95% confidence intervals. A value of $P < 0.05$ was considered significant.

Bioethical aspects

The protocol was approved by the Ministry of Public Health, the Ministry of Education, and the PUCE Human Research Ethics Committee (CEISH).

Regarding confidentiality, the information provided is kept by the research team in coded form for 7 years, it can only be disclosed through articles and academic presentations, maintaining the anonymity of the participants. The results of the blood and stool tests will be delivered to the parents/guardians of the children.

In the informed consent, it was explained that the study does not bring immediate benefits, but by identifying the nutritional diagnosis in the children studied

and linking this with the conditions of the home and community, it will later help to define actions to improve the health situation of children/indigenous people.

Results

Study participants
1228 participants were included in the study.

Association between CM with sociodemographic characteristics
1228 boys and girls under 5 years of age were included, of which 50.5% (n = 620) were males and 49.5% (n = 680) were female. As shown in Table 1, 52.6% (n = 326) of males and 46.7% (n = 284) of females had CM (OR = 1.27; 95% CI 1.01-1.58) ($P<0.05$).

The Riobamba canton contained the majority of the children in the study with 35.9% (n = 441), of which 46.6% (n = 206) had CM. There were no statistical differences between the prevalence of CM between cantons. The highest percentage (58%) of mothers had one to two children, of which 44.8% had CM (n = 699). The children of mothers having between 7 to 11 children (5%) had OR 2.23 (95% CI = 1.28-3.88) in relation to those having one to two children, corresponding to 58.8% (n = 699)($P< 0.01$). As shown in Table 1, 60% (n = 691) of the families had an income of less than $200 and 54% (n = 370) of the children living in these households had CM; these children are 1.43 times more likely to be chronically malnourished (95% CI = 1.13-1.83) compared to the children of families with incomes over $200 ($P<0.01$).

The education of mothers and fathers was a factor associated with the presence of malnutrition at all levels. As shown in Table 2, when setting mothers with higher education as the reference, the presence of malnutrition is mostly associated with women with the lowest level of education.

Association between CM and SC
Association between CM and the trust and solidarity dimension
As shown in Table 3, 62.9% (n=764) of parents had confidence in other people in the community, of which 52.9% had CM (n = 404)(OR 0.71; 95% CI = 0.56-0.9)($P=0.004$).

Association between CM with the collective action and cooperation dimension
The children of those who work for the benefit of the community had OR 1.39 (95% CI = 1.0-1.8) for the presence of CM compared to children of those who do not ($P=0.013$). Variables such as working in activities and "mingas", probability of being fined or criticized, collaborating with time and money for the community were not statistically significant (see Table 3).

Association between CM and the dimensions information, communication, and social cohesion
Most of the families, 73.7% (n = 905), had received information about infant nutrition, of which 47.3% (n = 428) had CM. Those who had not heard about child malnutrition had an OR 1.46 (95% CI = 1.13-1.9) for the presence of CM ($P<0.01$) (Table 3). People who do not plan to live in the community for several years had OR 0.66 (95% CI = 0.38-0.9) for the presence of CM, compared to those who planned to live in their community for several years ($P=0.015$).

Association between CM and the groups and networks dimension
Most parents (52%) did not participate in any organization; however, those who did participate had OR 1.36 (95% CI = 1.1-1.7) for the presence of CM compared to those who do not ($P= 0.007$) (see Table 3). The other variables of this dimension were not significantly associated with CM.

Multivariate association between CM and social capital
When performing a multivariate analysis between whether the mother and/or caregiver had heard about child malnutrition, as one of the elements of SC that was directly associated with a lower probability of presenting CM, we observed that the association remained statistically significant, after adjusting for sex, age of the child, the number of children, and the monthly income of the families (see Table 4).

Discussion
The association between SC and health has emerged as an area of increasing interest in the field of public health, epidemiology, and medicine in general. Sev-

eral studies have shown that SC is significantly associated with a positive outcome in the health of populations [4-6]. In this study, we analyzed the association between SC and CM in indigenous children, with the hypothesis that the higher the SC in the family, the lower the prevalence of CM in children under 5 years of age.

Our results show that parents who do not trust the members of their community and those who do not have the confidence to ask for or lend money are less likely to have children with CM. On the other hand, parents who think that trust has improved in the community over the past five years are more likely to have children with CM. According to these findings, a low SC, summarized as the lack of trust in community members, is a protective factor for the development of CM, which differs from other studies that state that a better SC is the patrimony of individuals who belong to an indigenous group, voluntarily participate in organizations, have a high level of education, and are of an advanced age [26, 27].

In the dimension of collective action and cooperation, our results show that the children of parents who participate for the benefit of the community have 1.39 (95% CI = 1-1.8) times higher probability of developing CM. In the groups and networks dimension, our results indicate that parents who participate in organizations are more likely to have children who develop CM. This is a very different result from other investigations that indicate that the organization and participation of parents in the community constitute dynamic agents of local development, thus forming one of the most important variables of SC [28, 29].

Regarding social cohesion, the present results show that parents who do not plan to live in the community for several years have a 44% (95% CI: 0.38-0.9) lower probability of having children with CM. Other studies have shown that families who migrate to large cities seeking to improve their quality of life due to the lack of jobs, healthcare, and educational opportunities in rural areas [30-34]. These findings do not coincide with the theory that social capital improves the health of the population.

In our multivariate analysis, the only SC element that was found to be significantly associated with a lower probability of CM was nutritional information.

Parents who do not receive information on child nutrition are 1.46 (95% CI = 1.13-1.9) times more likely to have children with CM (P= 0.004). This is consistent with studies that concluded that nutritional information is associated with lower child malnutrition, since it provides a society with a panoramic view of the implications of this disease on children's health [30, 31]. Thus, the information and communication dimension influences health status. In this regard, several studies and bibliographic reviews coincide [32, 33].

Current evidence shows that SC is a determinant related to health and as a concept it is becoming increasingly important in international health research; however, further standards are needed for its measurement [35, 36]. Although a relationship between SC and positive population health indicators has been observed, this effect would be very low for health indicators, such as CM, which are complex and depend on structural determinants [37]. Therefore, this could explain the presence of contradictory results in our study. In addition, there are some contextual and dynamic interaction elements that need to be considered when analyzing SC, which can determine the effects of SC at the public health level [38]. As previously mentioned, the indigenous population of Chimborazo is a community characterized by strong organizational processes, having a marked life and historical trajectory; however, it is not possible to establish a direct relationship between these processes with CM.

One limitation of this study is that it is cross-sectional quantitative research, which does not allow us to determine cause-effect relationships. Additionally, the concept of SC is difficult to measure given the different levels and dimensions that comprise it. In this study, we approximated the measurement of household SC; however, some contextual elements need to be explored in greater detail and included in the assessment of SC. Among the advantages of this study, it should be noted that it is one of the first to assess the relationship between SC in the indigenous population and CM in children under 5 years of age. The results of this study highlight the importance of health education directed at parents and communities in order to protect the health of children. Thus, it is necessary to consider public policies that favor educational processes, without ignoring other structural determinants that affect child nutrition and development.

Table 1 Association between CM and sociodemographic characteristics

	Chronic malnutrition n=610	No chronic malnutri- tion n=618	OR (95% CI)	P
Male vs female sex	326 (53.4%)	294 (47.6%)	1.27 (1.01-1.58)	0.040
Income <200 USD	370 (60.7%)	321 (51.9%)	1.43 (1.13-1.82)	0.003
With HDB	146 (23.9%)	102 (16.51%)	1.7 (1.20-2.11)	0.001
Child's age				
1-11 months	15 (2.5%)	42 (6.8%)	0.41 (0.22-0.76)	0.05*
12-24 months	107 (17.5%)	131 (21.2%)	0.93 (0.67-1.28)	0.66
25-36 months	203 (33.3%)	130 (21.0%)	1.78 (1.32-2.39)	0.001*
37-48 months	98 (16.1%)	102 (16.5%)	1.1 (0.78-1.54)	0.60
49-59 months	187 (30.7%)	213 (34.5%)	Reference	Ref
Canton of origin				
Riobamba	206 (33.8%)	236 (38.2%)	0.80 (0.44-1.32)	0.39
Alausí	123 (20.2%)	113 (18.3%)	1.00 (0.59-1.71)	0.99
Colta	79 (13.0%)	78 (12.6%)	0.93 (0.54-1.63)	0.81
Guamote	164 (26.9%)	156 (25.2%)	0.97 (0.58-1.61)	0.90
Guano	38 (6.2%)	35 (5.7%)	Reference	Ref
Mother's age				
10-14 years	1 (0.2%)	1 (0.2%)	0.98 (0.01-16.09)	0.1
15-19 years	27 (4.4%)	31 (5.0%)	0.86 (0.45-1.60)	0.63
20-29 years	287 (47.0%)	318 (51.5%)	0.89(0.60-1.31)	0.55
30-39 years	166 (27.2%)	157 (25.4%)	1.04 (0.69-1.58)	0.85
40-54 years	61 (10.0%)	60 (9.7%)	Reference	Ref.
Number of children in the household				
7-11	38 (6.2%)	21 (3.4%)	2.23 (1.28-3.88)	0.004*
5-6	67 (11.0%)	43 (7.0%)	1.92 (1.27-2.90)	0.002*
3-4	173 (28.4%)	148 (23.9%)	1.44 (1.11-1.88)	0.007*
1-2	313 (51.3%)	386 (62.5%)	Reference	
Number of people living in the household				
10-14	10 (1.6%)	10 (1.6%)	1.23 (0.51-3.01)	0.64
8-10	58 (9.5%)	39 (6.3%)	1.84 (1.19-2.84)	0.007*
5-7	264 (43.3%)	230 (37.2%)	1.42 (1.11-1.80)	0.005*
2-4	261 (42.8%)	322 (52.1%)	Reference	

HDB: Human development bonus

Table 2 Association between CM and parental education.

	Chronic malnutrition n=610	No chronic malnutrition n=618	OR (95% CI)	P
Mother's schooling				
None	56 (9.2%)	44 (7.1%)	2.4 (1.27-4.70)	0.007
Preparatory	19 (3.1%)	12 (1.9%)	3 (1.24-7.35)	0.015
Basic	339 (55.6%)	313 (50.6%)	2 (1.21-3.54)	0.008
High school	174 (28.5%)	206 (33.3%)	1.6 (0.93-2.81)	0.091
Higher	22 (3.6%)	42 (6.6%)	Referencia	
Father's schooling				
None	72 (11.8%)	60 (9.7%)	1.94 (1.22-3.36)	0.018
Preparatory	20 (3.3%)	9 (1.5%)	3.6 (1.47-8.80)	0.005
Basic	290 (47.5%)	251 (40.6%)	1.87 (1.18-2.96)	0.008
High school	194 (31.8%)	243 (39.3%)	1.29 (0.81-2.06)	0.283
Higher	34 (5.6%)	55 (8.9%)	Referencia	

Table 3. Association between CM and social capital.

	Chronic malnutrition n=610	No chronic malnutrition n=618	OR (95% CI)	P
Trust and community solidarity				
Lack of trust in other people	200 (32.8%)	251 (40.6%)	0.71 (0.56-0.90)	0.004
Belief that confidence has improved in the last 5 years	195 (32.0%)	155 (25.1%)	1.36 (1.0-5.77)	0.019
Lack of confidence to ask / lend money	207 (33.9%)	248 (40.1%)	0.76 (0.59-0.98)	0.036
Collective action and cooperation				
Work for the benefit of the community in the last year	470 (77.0%)	435 (70.4%)	1.39 (1.00-1.80)	0.013
Information and communication				
The tutor has not heard information about infant nutrition	176 (28.9%)	134 (21.7%)	1.46 (1.13-1.90)	0.004
Social cohesion				
The guardian does not plan to live in the community for several years	36 (5.9%)	60 (9.7%)	0.56 (0.38-0.90)	0.014
Groups and Networks				
The father participates in an organization	341 (55.9%)	298 (48.2%)	1.36 (1.09-1.70)	0.007
Access to health services				
Private doctors in charge of community health	47 (7.7%)	55 (8.9%)	0.64 (0.41-0.98)	0.04
Travel time> 1 hour to the nearest Health Center	59 (9.7%)	41 (6.6%)	1.75 (1.12-2.74)	0.014
Breastfeeding, food intake and infectious diseases				
Gastroenteritis in the last 6 months	163 (44.3%)	116 (55.7%)	1.53 (1.14-2.05)	0.004
Parasitism> 2 times in the last 6 months	14 (55.7%)	4 (44.3%)	4.57 (1.5-14.0)	0.008

Table 4 Multivariate association of social capital and CM.

Variable	OR (IC 95%)	Valor p
The tutor has not heard of malnutrition	1.60 (1.21-2.13)	0.001**
Male sex	1.26 (0.98-1.50)	0.065
Age		
1-11 months	0.47 (0.24-0.94)	0.03*
12-24 months	0.95 (0.67-1.34)	0.78
25-36 months	2.03 (1.48-2.78)	0.001*
37-48 months	1.14 (0.79-1.63)	0.48
49-59 months	Reference	Ref.
Number of children		
3-4 children	1.49 (1.13-1.98)	0.005**
5-6 children	1.73 (1.13-2.68)	0.012*
7-11 children	2.58(1.23-4.14)	0.008**
1-2 children	Reference	Ref.
Monthly income		
< $ 200	1.31(1.02-1.69)	0.003**
> $ 200	Reference	Ref.

Conclusions

In conclusion, we found an association between SC (communication and information dimension) and CM in indigenous children under 5 years of age in the province of Chimborazo. CM was more prevalent in households that lacked information on child nutrition. Intersectoral national public policies that favor the SC of the communities through health education processes are necessary.

Abbreviations

CM, chronic malnutrition. SC: social capital.

Acknowledgments

The authors thank to the communities participating in the study for their support of this project..

Authors' contributions

LPGY: Research idea, data collection, article writing, statistical analysis, editorial corrections.
MFR: Direction of research, critical analysis of the article.
ALM: Methodological advisor, statistical analysis.
JC: Research idea, data collection.
FA Research idea, data collection.
JB: statistical analysis, data collection.
BT: statistical analysis, data collection.

AT: Methodological advisor, reseach idea.
All authors read and approved the final version of the manuscript.

Authors information

Patricio Guamán Yupangui, Doctor from the National University of Chimborazo; Specialist in Pediatrics from the Pontifical Catholic University of Ecuador. https://orcid.org/0000-0002-1123-3235
María Fernanda Rivadeneira Guerrero, Doctor in Medicine and Surgery from the Pontificia Universidad Católica del Ecuador (2006), Magister in Public Health with a Mention in Health Services and Systems Research from the Pontificia Universidad Católica del Ecuador (2009), Magister in Clinical Research and Epidemiology from the University of Guayaquil (2015), Doutora Em Epidemyology from the Federal University of Rio Grande Do Sul (2017). Researcher at the Pontifical Catholic University of Ecuador.
Ana Lucía Moncayo Benalcazar, Graduated in Biological Sciences from the Pontificia Universidad Católica del Ecuador (2002), Master in Community Health from the Federal University of Bahia (2011), Doutor Em Saude Publica from the Federal University of Bahia (2013). Researcher at the Pontificia Universidad Católica del Ecuador.

Availability of data and materials

The datasets generated and/or analysed during the current study are not publicly available due participant confidentiality but are available from the corresponding author on reasonable request.

Ethical statements
Protection of persons

The authors declare that the procedures followed were in accordance with the ethical standards of the responsible human experimentation committee and in accordance with the World Medical Association and the Declaration of Helsinki.

Confidentiality of the data

The authors declare that they have followed the protocols of their work center on the publication of patient data.

Consent for publication

The authors have obtained the informed consent from the guardians of the patient referred to in the article. This document is in the possession of the corresponding author. The parents have signed the authorization for publication of this case. The protocol was approved by the Ministry of Public Health, the Ministry of Education, and the PUCE Human Research Ethics Committee (CEISH). An informed assent was made from each participant.

Competing interests

The authors have no competing interests to declare.

.

References

1.   Alves JGB, Alves GV. Effects of physical activity on children's growth. J Pediatr (Rio J) [Internet]. 2019 Mar;95:72–8. SU: sciencedirect

2.   Alderman H, Behrman JR, Glewwe P, Fernald L, Walker S. Evidence of Impact of Interventions on Growth and Development during Early and Middle Childhood. In: Disease Control Priorities, Third Edition (Volume 8): Child and Adolescent Health and Development [Internet]. The World Bank; 2017:79–98. DOI: 10.1596/978-1-4648-0423-6_ch7

3. Samson M, Fajth G, François D. Cognitive capital, equity and child-sensitive social protection in Asia and the Pacific. BMJ Glob Heal [Internet]. 2016;1(Supp 2):I19–26. SU: bmj/i19

4. Hiroshi Murayama, Yoshinori Fujiwara IK. Social Capital and Health: A Review of Prospective Multilevel Studies. J Epidemiol. 2012;22(3):179–87. DOI: 10.2188/jea.je20110128. Epub 2012 Mar 17. PMID: 22447212; PMCID: PMC3798618.

5. Kripper CE. Capital social y salud en América Latina y el Caribe: una revisión sistemática. Rev Panam salud pública. 2009;25(2):162–70.

6. Ferrelli R. Cohesión social como base para políticas públicas orientadas a la equidad en salud: reflexiones desde el programa EUROsociAL [Internet]. Revista Panamericana de Salud Pública. 2015;28:272–277. SU scielosp/S1020

7. De la Torre M, Oyola A. Los determinantes sociales de la salud: una propuesta de variables y marcadores/indicadores para su medición. Rev Peru Epidemiol [Internet]. 2014; SU: redalyc/203132677002

8. Labra ME. Capital social y consejos de salud en Brasil: ¿un círculo virtuoso? Cad Saude Publica. 2002;18(suppl):S47–55.

9. Ke Y, Jiang J, Chen Y. Social capital and the health of left- - behind older adults in rural China : a cross- - sectional study. BMJ Open. 2019;Nov 25;9(11):e030804. DOI: 10.1136/bmjopen-2019-030804. PMID: 31772090; PMCID: PMC6886947

10. Wu Q, Lu D, Kang M. Social capital and the mental health of children in rural China with different experiences of parental migration Social Science & Medicine Social capital and the mental health of children in rural China with different experiences of parental migration. Soc Sci Med. 2015 May;132:270-7. DOI: 10.1016/j.socscimed.2014.10.050. Epub 2014 Oct 28. PMID: 25465499.

11. Guang Y, Feng Z, Yang G, Yang Y, Wang L, Dai Q, et al. Depressive symptoms and negative life events: What psycho-social factors protect or harm left-behind children in China? BMC Psychiatry. 2017;17(1):1–16. DOI: 10.1186/s12888-017-1554-1. PMID: 29246120; PMCID: PMC5732424.

12. Kondo N, Sembajwe G, Kawachi I, Van Dam RM, Subramanian S V., Yamagata Z. Income inequality, mortality, and self rated health: Meta-analysis of multilevel studies. BMJ. 2009;339(7731):1178–81. . DOI: 10.1136/bmj.b4471. PMID: 19903981; PMCID: PMC2776131.

13. Rocco L, Suhrcke M. Is social capital good for health? A European perspective. EuroWhoInt [Internet]. 2012;1–24. SU: euro.who/170078

14. Chanchala T, Buddhika S, Glozier N. Social Science & Medicine Measurement of social capital in relation to health in low and middle income countries (LMIC): A systematic review. Soc Sci Med [Internet]. 2015;128:95–104. DOI: 10.1016/j.socscimed.2015.01.005

15. Khazaeian S, Kariman N, Ebadi A, Nasiri M. The impact of social capital and social support on the health of female-headed households: a systematic review. Electron Physician. 2017;9(12):6027–34. DOI: 10.19082/6027. PMID: 29560156; PMCID: PMC5843430

16. Cepal C. Capital social y pobreza en Ecuador 2010-2012. Ánfora [Internet]. 2002 [cited 2019 Apr 24];20(35):93–115. SU: redalyc/3578

17. Macas L, Vacacela A. Capital social , etnicidad y desarrollo : algunas consideraciones críticas desde los andes. 2001;(2):1–62.

18. INEC. Encuesta Nacional De Desempleo Y Contenido. Indicadores Laborales [Internet]. 2018; SU: Inec

19. Serrano M, Serrano JC. Reporte de Pobreza. Inec [Internet]. 2016;1–9. Available from: INEC/informepobreza

20. Cabrera E, Molina-Vera A, Alexander-Sharman M, Moreno L, Cuevas F. Análisis geográfico de la pobreza y desigualdad por consumo en Ecuador. Rep la Pobr por Consum Ecuador 2006-2014 [Internet]. 2014;146–71. SU: Inec/informe

21. Instituto Nacional de Estadísticas y Censos del Ecuador. Resultado del Censo 2010 - Fascículo Provincial de Chimborazo. 2010;8. Available from: SU: Inec/informe/provincias

22. Freire W, Ramírez M. Encuesta Nacional de Salud y Nutrición [Internet]. SU: Ecuadorencifras/ensanut

23. UNICEF. Encuesta de Indicadores Múltiples por conglomerados. 2015;1–11. SU: unicef.uy/137

24. Blossner M, Siyam A, Borghi E, Onis de M, Onyango A, Yang H. Manual WHO Anthro para computadoras personales. 2007; Available from: who/childgrowth/anthro

25. Porret M. Manual para la gestión del capital humano en las organizaciones. [Internet]. Los Grupos y la Motivación. 2010. Capitulo 2. SU: deusto/21

26. de Onis M, Onyango AW, Borghi E, Siyam A, Nishidaa C, Siekmann J. Elaboración de un patrón OMS de crecimiento de escolares y adolescentes. Bull World Health Organ [Internet]. 2007;85:660–7. SU: who/growthref

27. Phonvisay A, Suruga T, Lucero-Prisno DE. Impact of social capital on child nutrition status: three villages case of Oudomxay province in Lao People's Democratic Republic. J Glob Heal Sci [Internet]. 2019;1(1):1–16. SU: e-jghs/9986

28. Zulia UDEL, Estudios DDECDE, Secretaría L, Docente D, Luz D, Bermudez B, et al. Universidad del zulia. 2010;(December):7596796. SU: researchgate/Luis_Pina_Lopez

29. Ayaviri Nina VD, Quispe Fernandez GM, Borja Lombeida ME. El capital social en el desarrollo local comunitario. Un estudio en comunidades rurales de Bolivia. Espacios [Internet]. 2017;38(43). SU: revistaespacios/a17v38n43

30. Longhi F, Gómez A, Zapata ME, Paolasso P, Olmos F, Margarido SR. La desnutrición en la niñez argentina en los primeros años del siglo XXI: Un abordaje cuantitativo. Salud Colect [Internet]. 2018;14(1):33–50.SU: scielosp/2018.v14n1/33-50

31. Katzmarzyk PT, Martin CK, Newton RL, Apolzan JW, Arnold CL, Davis TC, et al. Weight Loss in Underserved Patients - A Cluster-Randomized Trial. N Engl J Med [Internet]. 2020;383(10):909–18. **DOI:** 10.1056/NEJMoa2007448

32. Bravo Vallejos ND. El capital social como determinante de salud pública. Rev Calid Asist [Internet]. 2017 Nov;32(6):342–6. **SU:** sciencedirect/S11342

33. Harpham T. Measuring social capital within health surveys: key issues. Health Policy Plan [Internet]. 2002 Mar 1;17(1):106–11. **PMID:** 11861592

34. Sosa M. Caracterización de niños de hasta 9 años con desnutrición proteicoenergética. 2015;19(2):180–6. **SU:** scielo.cu/san05192

35. Lee S, Jung M. Social Capital, Community Capacity, and Health. Health Care Manag (Frederick) [Internet]. 2018;37(4):290–8. PMID: 30234638

36. Carrillo Álvarez E, Riera Romaní J. Measuring social capital: further insights. Gac Sanit [Internet]. 2017 Jan;31(1):57–61. **PMID:** 27793546

37. Xue X, Reed WR, Menclova A. Social capital and health: a meta-analysis. J Health Econ [Internet]. 2020;72:102317. **DOI:** 10.1016/j.jhealeco.2020.102317

38. Shiell A, Hawe P, Kavanagh S. Evidence suggests a need to rethink social capital and social capital interventions. Soc Sci Med [Internet]. 2020;257(March 2018):111930. **DOI:** 10.1016/j.socscimed.2018.09.006

DOI: Digital Object Identifier
PMID: PubMed identifier
SU: Short URL

Publisher's Note