

Intersectoral oral health promotion interventions for schoolchildren living in remote rural Andean communities: a realist evaluation

Dave A. Bergeron^{1,2}

Lise R. Talbot³

Isabelle Gaboury⁴

Affiliations:

1. Faculty of Medicine and Health Sciences, Université de Sherbrooke, Longueuil (Québec) Canada
2. Department of Nursing, Université du Québec à Rimouski, Rimouski, (Québec) Canada
3. School of Nursing, Université de Sherbrooke, Sherbrooke (Québec) Canada
4. Department of Family Medicine and Emergency Medicine, Faculty of Medicine and Health Sciences, Université de Sherbrooke, Longueuil (Québec) Canada

Keywords: Oral health promotion – Schoolchildren – Rural communities –
Realist evaluation

Word count: 4 500 words (including references)

Contact: Dave A. Bergeron
Department of Nursing
Université du Québec à Rimouski
300 Allée des Ursulines, Rimouski, Québec, G5L 3A1, Canada.
Email: Dave_Bergeron@uqar.ca

ABSTRACT

Background: Intersectoral oral health promotion (IOHP) entails the participation of local communities. IOHP interventions were introduced in Peru in primary schools in 2013 but oral health among schoolchildren living in rural Andean communities remains suboptimal.

Objectives: To understand the contextual elements and the underlying mechanisms associated with IOHP interventions' current effects on schoolchildren living in remote rural Andean communities.

Method: A realist evaluation was carried out in three rural Andean communities where IOHP interventions aiming schoolchildren have been implemented. Following an evaluation of effects among schoolchildren, contextual elements and mechanisms were explored with various stakeholders involved in IOHP through focus groups and semi-structured interviews. Subsequently, an iterative data analysis and a validation process resulted in the identification of Context-Mechanism configurations.

Results: Previous positive experiences of collaboration, focus on communication, feelings of being respected and considered, and development of leadership and trust among stakeholders involved in IOHP are elements of configurations that influence positively effects of an IOHP. On the other hand, unfavorable physical, social and political environments, previous negative health experiences, feelings of not being respected and considered, demotivation, development of mistrust and insufficient leadership are shown to influence outcomes negatively.

Conclusion: This research highlights the complexity associated with the deployment of IOHP interventions in rural communities. Local stakeholders should be further involved to

consolidate trust, to facilitate coordination processes among remote rural communities and oral health professionals, and to optimize deployment of IOHP interventions.

INTRODUCTION

The prevalence of oral health (OH) diseases among schoolchildren still important in Latin America (1, 2) and in Peru (3-5), mainly among those living in rural (1), marginalized (3, 4), or low-economic status communities (1-5). In Peru as in many middle-income countries, current OH inequities in health are related to the social determinants of health (3, 4, 6, 7).

To ensure sustainable change (6-9) and strive for more equity, social determinants must be addressed through “the implementation of effective and appropriate OH policies and interventions” (7) such as intersectoral oral health promotion (IOHP). Intersectoral actions involving local stakeholders can address social et economic structural factors contributing to a problem (10). To implement these actions, intersectoral collaboration, defined as a collective action where several stakeholders from different sector with a relationship of trust (11, 12) and a common goal take on different roles (11-13), is essential (13). Intersectoral collaboration is unfortunately not always present in practice (13, 14), and intersectoral actions are often poorly evaluated (15, 16), making continuous quality improvement changes difficult to identify and to implement (15).

In Peru, the Ministry of health developed an IOHP initiative in 2007 (17). This initiative was integrated in 2013 into the national health plan for schools. According to the plan, OH professionals should perform various IOHP interventions in schools: 1) workshops on OH; 2) toothbrushing and flossing demonstrations; 3) distribution of toothbrushes and fluoride containing toothpaste; and 4) application of fluoride and sealants (18). Teachers are also involved in IOHP by performing daily promotion of toothbrushing and by ensuring that every child has a toothbrush and fluoride containing toothpaste available at school (18-20).

The Peruvian IOHP is the responsibility of OH professionals working in public health centres. Their actual deployment is uneven across the country (21), particularly in the remote rural Andean areas (22), and the form and level of involvement of community stakeholders are not clear. Some factors partially explain this situation including the shortage of OH professionals (23), the low involvement of other health professionals in IOHP (24), and the fragmentation of the Peruvian health system where policies are developed by the Ministry of Health while implementation is managed at regional and local level (25).

Considering the suboptimal deployment of IOHP interventions in remote rural Andean communities, it is important to understand how those interventions work in depth (9). To do so, we must understand which contextual elements and underlying mechanisms can underpin the actual deployment of interventions and the level of collaboration among local stakeholders. This process can facilitate the adaptation of IOHP interventions to local circumstances and can optimize intersectoral collaboration. The aim of this research is to understand the contextual elements and the underlying mechanisms explaining IOHP outcomes on schoolchildren living in remote rural Andean communities.

METHODS

Design

This article represents the third phase of a project that aims to evaluate, with a realist evaluation (RE), the deployment of IOHP interventions carried out for schoolchildren in remote rural Andean communities (26). RE is theory-driven and allows the exploration and understanding of influences of context and underlying mechanisms on intervention outcomes (27). RE is iterative and consists of four steps including: initial program theory

development; mixed data collection process; data analysis and development of Context-Mechanism-Outcomes configurations (CMOC) that highlight relationships among context, mechanisms and outcomes; and the refinement and validation process of CMOC (28).

In the first phase, potential contextual elements and underlying mechanisms that may influence the implementation of intersectoral health promotion interventions in schools were mapped (29) and an initial program theory of the Peruvian IOHP interventions in rural communities was developed (30). In the second phase, IOHP outcomes were documented in schoolchildren, using quantitative measures including dental examinations and validated questionnaires (31). In the subsequent phase, focus groups and semi-structured interviews of various stakeholders involved in IOHP were presented measured outcomes, and by inference explored contextual elements and mechanisms (28), to identify which mechanisms are triggered in given predetermined contexts. This process is intended to better understand the causal pathway (28, 32).

Ethical considerations

This research project was approved by the Comité d'éthique de la recherche en santé chez l'humain du Centre hospitalier universitaire de Sherbrooke (project #2016-1344). Participants were informed that research data would remain confidential and anonymity would be preserved.

Participants

Stakeholders were recruited according to theoretical sampling (33), so that all types of stakeholders involved in IOHP are represented: 1) OH professionals; 2) teachers; 3) parents; 4) education managers; 5) health managers; and 6) other community stakeholders.

Teachers, parents and other community stakeholders were recruited in three remote rural communities where the second phase of this project was conducted (31). OH professionals were recruited in the health center that provides coverage to participating remote rural communities. Education and health managers were recruited from local and regional authorities involved. They were identified and approached by a research assistant speaking Spanish and Quechua to inform them of the research project and to gather their formal consent to participate. Participants volunteered to participate.

Data collection

Focus groups were conducted with each of the types of stakeholders (except for OH professionals and education and health managers) in each community (when possible) to further analyze how IOHP interventions works and to identify different contextual elements and mechanisms involved (28, 32). Groups had between 4 and 10 participants. The open interview grid used (34) respected the principles of realist interviews (35), and was developed from potential contextual elements and mechanisms identified in the first phase of this project (29).

To deepen understanding of various emerging themes, semi-structured interviews were conducted with representatives of each types of stakeholders involved in IOHP and each of the participating communities. Interviews were conducted in the living or working environment of participants with a similar interview grid enhanced by focus group data. When agreed and available, some stakeholders who participated in focus groups also participated in interviews.

Focus groups and interviews were performed by the same research assistant in Spanish or Quechua according to the language commonly used by participants, were recorded (34) and transcribed verbatim (33) in Spanish by the research team.

Data analysis

Data was coded with NVivo 11 with a directed content approach (36) adapted for RE. Co-coding was performed by the principal investigator (DAB) and a research assistant from the Spanish version (37) to ensure credibility (38). Then, matrix queries were used to explore recurring patterns in data (39), and to identify connections (40) and develop CMOC. Memos related to the identification of connections among concepts were written during the coding process and compared with the CMOC generated through matrix queries (41). Final CMOC were revised by co-investigators (LRT and IG), and were validated during a focus group with stakeholders involved in the research.

RESULTS

A total of 59 stakeholders participated in the third phase of this project, with eight focus groups and 28 semi-structured interviews. Stakeholder characteristics are summarized in Table 1 (online supplemental file).

CMOC presented in Figure 1 are categorized in two different levels: 1) contexts and mechanisms (CM) external to remote rural communities, and 2) CM internal to remote rural communities. Each external and internal CM includes contextual elements, situational mechanisms that “operate at the macro-to-micro level” (42); and transformational mechanisms that “operate at the micro-to-macro level and show how a number of individuals, through their actions and interactions, generate macro-level outcomes” (42).

CM are also categorized according to their influence on IOHP interventions' effects: positive or negative influence. As described below, two external and two internal CM exert a negative influence, while only two internal CM exert a positive influence on OHP outcomes. IOHP interventions' effects related to CM configurations are not presented in this manuscript. These positive and negative outcomes (O of CMOC) on schoolchildren are being published in another article (31).

External CM with negative influences on OH outcomes

- External CM 1

Intersectoral administrative guidelines had previously been developed by the Regional Directorate of Education and Regional Directorate of Health, on the deployment of health promotion interventions in primary schools (context). When deploying IOHP interventions, the health and education administrators did not have the same attitudes towards the afore-mentioned health promotion activities (transformational mechanism 1) and there was insufficient mutual understanding of the deployment process of IOHP interventions (situational mechanism 1). Inadequate communication channels (situational mechanism 2) and deficient coordination processes (situational mechanism 3) between the two sectors also emerged. Some elements of this external CM are illustrated by a health administrator talking about the intersectoral agreement between the regional directorates of education and health:

Therefore, one way or another, we must ally with them because although the goal is health development, it is combined with education. Therefore, yes, there is articulated work, but this is at different levels [regional administration, local administrations and schools]. There is not always an operative plan; there are

difficulties, we have seen it. Nevertheless, the agreement has been helping us in some way, with these problems, to open the doors of institutions. (Regional health administrator 1)

Another health administrator added additional elements on the intersectoral agreement:

Look, in the region, we handle the health promotion area. It is the area specifically in charge of coordinating with the UGEL [local education management unit]. There are annual coordination meetings where we all participate in a round table. It is at this round table that we make agreements, propose road maps and program the activities for the coming year. [...] What does this mean? That the UGEL is committed to incorporate these themes in their class topics. [The education sector] should do this; however, it did not happen as planned last year. (Regional health administrator 3)

- External CM 2

The lack of human, material and financial resources (context 1), academic training of OH professionals who are trained principally for curative rather than OH preventive care (context 2), and the presence of performance indicators focusing on curative care (context 3) have contributed to the prioritization of the curative approach at the expense of IOHP (transformational mechanism 1). These contextual elements, in addition to the geographical remoteness of rural communities (context 4), also contribute to demotivate OH professionals (transformational mechanism 2), and affect their leadership (situational mechanism 1) and the coordination process of IOHP interventions (situational mechanism 2). These words of an OH professional regarding the work in schools and at the health center illustrate limits of capacity and this external CM overall:

We have goals [of dental restorations to achieve], therefore it is a little bit difficult, because, let's say, I go to schools, I attend [schoolchildren]. I come back here to the health center [in the district capital] and there are other people waiting for me to attend them [for curative OH care]. I sometimes feel tired, because I have done my work, I have completed my shift and all, but I arrive and there they are waiting for me. It is therefore difficult sometimes for me to attend all [children and adults living in rural communities and in the district capital]. That is the problem. (OH professional, district capital)

A health administrator also expressed additional elements related to this configuration:

There is quite a wide gap in human resources for this sector. Is this the main weakness?... And also our colleagues from the universities, where professionals are trained in a purely curative approach. (Regional health administrator 1)

Internal CM with negative influence on OH outcomes

- Internal CM 1

Most rural community stakeholders and parents have had negative experiences with health professionals in the past (context). Additionally, these rural community members reported feeling geographically, socially, and politically isolated. The social environment (including traditional lifestyle and practices) in remote rural communities has also been identified by several stakeholders (context). These contextual elements have contributed to the development of a feeling of not being considered and respected by health professionals

(transformational mechanism). When IOHP interventions were introduced, parents and rural community stakeholders also had high expectations (transformational mechanism). The conjunction of these contextual elements and transformational mechanisms has contributed to the development of mistrust towards health professionals including OH professionals (situational mechanism). A few elements of this internal CM are illustrated by the remarks of a health administrator:

Then, many parents or teachers feel that they have been misled, because, as they say: “you told us that you would provide for us and you have not delivered. Therefore, why should we participate if you do not comply?” (Regional health administrator 3)

- Internal CM 2

In some rural communities, there have been previous social and political tensions among some community members (context). This situation led to the demotivation of stakeholders in IOHP interventions (transformational mechanism) and affected their ability to assume their leadership within the community (situational mechanism). A local authority talking about the level of involvement of some community members said:

When we talk to the people of the community about these things, they don't want to listen. This is why, as authorities, we do not participate much in these activities; we sometimes talk to [community members] about something important and they act as if they do not want to listen. They say they are in a rush, or they began to talk among themselves. This demotivates us from continuing with the awareness program. (Local authority 2, community 2)

Internal CM with positive influence on outcomes

- Internal CM 3

Some teachers have lived positive experiences of collaboration with parents and community members (context). Considering the impact of poor OH on the children's learning process, teachers have developed a proactive attitude towards promoting OH (transformational mechanism). Some teachers have developed leadership in the communities related to IOHP (situational mechanism 1), and initiated a coordination process with some communities stakeholders (situational mechanism 2). This internal CM configuration fostered the emergence of the following configuration (internal CM 4). As one expressed:

We talk to [health professionals]; well, this can be done, for sure. However, as my colleagues say, it does not go as far as planning. Therefore, we must be there, get involved in the preparation of material and carry on a campaign together with the nurse, so that the parents also get involved in this. [...] We are doing it because the children are always with toothaches. Because we are concerned, we will always keep on this work about oral health. (Teacher 2, community 3)

- Internal CM 4

The presence of previous positive experiences of collaboration with teachers within communities (context) combined with the presence of positive attitudes towards OH of some parents and community stakeholders (transformational mechanism) have fostered the development of a relationship of trust (situational mechanism 1) and complementarity

(situational mechanism 2) among community stakeholders involved in IOHP. A parent pointed out various elements included in the internal CM 3 and 4:

Yes, [teachers] involve [parents and community members]; they inform us about on-going activities, because there is a communal agreement. It is a verbal agreement with the communal president and the whole community. It would not be right if they did not inform us. As service users, we must also participate in the agreement and the activities. (Parent 5, community 3)

Two mothers shared about their involvement in IOHP and in other community activities:

If we, as steering committee, or as parents, did not support the teachers, they would no longer feel like keeping on with the work; this is why we always do what they ask us. (parent 2, community 1)

As I now know how to care, I have to put it in practice. I don't want my children to be like me, I make them brush and take care of their little teeth. When children do not have all their teeth, it disfigures their face and they look as if they were older. Some time ago, a health professional came over and taught us how to care for ourselves. So, I also take care of my little one, because I don't want him to be like me. (parent 4, community 1)

DISCUSSION

Using a RE, this study highlights the complexity associated with deployment of IOHP in remote rural settings. A cascade of dynamics among contextual elements and mechanisms external and internal to remote rural communities trigger mainly negative “ripple effects”

on the deployment of IOHP and development of collaboration between OH professionals and other stakeholders. This process decreases IOHP benefits for schoolchildren.

Complexity in health community interventions, the impact of the system-level on community-level (43), and the concept of “ripple effect” in community-based interventions (44) have been previously discussed, but this is the first study to describe and discuss these elements in IOHP and to highlight the presence of negative “ripple effects.” Through the use of focus groups and interviews with various stakeholders concerned with IOHP, this research allows a broader understanding of the perspective of different stakeholders (15). This can in turn improve effectiveness and sustainability of the initiative (44), particularly for the development of intersectoral collaboration in IOHP.

One of the key elements to consider in the deployment of IOHP is the management of financial and material resources in the developmental stage (8, 45-47). As this project and other scholars have shown, the lack of stable financial resources affects both the deployment and monitoring of IOHP interventions (12, 48), particularly in remote areas, considering the costs associated with remoteness (49). The Peruvian health system faces several other health priorities particularly in rural areas (25) which may explain the limited resources deployed in OH.

Emphasis must also be placed on human resources management (50). In Peru as in many other countries, there is currently a lack of OH professionals working in rural settings (23, 50, 51). The workload of OH professionals working in these regions is heavy, their recruitment is difficult (23, 50), and most are not well prepared to execute this particular role (20, 50). In rural settings, OH professionals must often work in a culture different from theirs, and must collaborate with various stakeholders to carry out IOHP, despite being

poorly trained or even untrained for these tasks (50, 51). Building relationships with parents and is another crucial element because the existence of previous negative experiences in relation with OH might affect the development of trust with OH professionals (52, 53). Then, themes related to cultural competency (51), humanist approach (8, 23), OH promotion (8, 52), interprofessional (47, 51) and intersectoral collaboration (8) should be addressed more deeply in OH professionals' academic and continued training. These skills would enable OH professionals to be more responsive to the needs and particularities of disadvantaged communities (6, 20).

Another key element to be aware of is the social and physical environments where a program is implemented, particularly in rural settings (54). Program implementers should rapidly identify challenges (geographical remoteness, social isolation, poverty, limited access to health services, etc.) (50, 54, 55) and assets (social relationships, existing physical infrastructure, volunteering) (54) present in rural areas where a program is being deployed. Afterwards, it is essential to identify and put in place ways to minimize identified challenges (50, 54) and maximize the use of existing assets (54).

There is a need to rethink IOHP as actually implemented in Peru in order “to develop context-specific strategies” for local communities (6). OH education, which is an important component of current IOHP interventions, cannot alone produce lasting change among schoolchildren (56, 57). To increase access to IOHP interventions and their impact, it would be important to further open OH promotion initiatives to other health professionals such as nurses (9, 24, 47, 51, 52) and to involve more local stakeholders such as teachers, parents, and community members (communal assemblies, school parent associations, local health promoters, community shopkeepers) in the development, implementation and

deployment of interventions (8, 45, 50, 51). The development of collaboration with communities stakeholders and other health professionals would enable the identification of local challenges and assets (54), then interventions to improve socio-economic conditions in rural communities (7). Intersectoral collaboration can facilitate afterwards the adaptation of IOHP interventions to local circumstances; increase their adoption by the local population, and ensure further sustainability (8, 51). In addition, the involvement of parents in IOHP predisposes them to have a more favorable attitude towards OH, which might contribute to increase toothbrushing frequency and other positive OH behaviors for their children (58).

Unfortunately, a top-down approach, (46) as used for the implementation of IOHP initiative in Peru, and a short-term vision of authorities have hindered or even stopped (in certain communities) collaboration with local stakeholders (45). To foster the emergence and sustainability of collaboration, an emphasis must be placed on the coordination (45, 47) and communication processes (including the development of a common language) both at the management and community levels (12, 46), and also between these levels (46, 59). This will help to comprehend better the perspectives of the members involved (15, 46), and facilitate the development of trust and a common vision on OH promotion among partners (12, 59).

Limitations

The major issue encountered during this project were language and cultural barriers, that could have influenced the interpretation of data (37, 60). The translation process used before data analysis (37) and the presence of a local bilingual research team (which included an anthropologist) limited the impact of these barriers on the analytical processes.

As well, although efforts were made to include a broad range of perspectives throughout this research, elite bias may be present. Triangulation of sources and methods, and examination of multiple cases and final validation with a group of stakeholders would serve to mitigate the impact of such bias (33).

This research provides a better understanding of key elements that have led to suboptimal IOHP outcomes on schoolchildren, and how IOHP interventions actually impact remote Andean rural communities. These results will contribute to discussions of how to reorient IOHP interventions in remote rural areas and to improve intersectoral collaboration among various local stakeholders.

REFERENCES

1. Botero JE, Rösing CK, Duque A, Jaramillo A, Contreras A. Periodontal disease in children and adolescents of Latin America. *Periodontol 2000*. 2015;67(1):34-57.
2. Gimenez T, Bispo BA, Souza DP, Viganó ME, Wanderley MT, Mendes FM, et al. Does the decline in caries prevalence of Latin American and Caribbean children continue in the new Century? Evidence from systematic review with meta-analysis. *PloS one*. 2016;11(10):e0164903.
3. Delgado-Angulo EK, Hobdell MH, Bernabé E. Poverty, social exclusion and dental caries of 12-year-old children: a cross-sectional study in Lima, Peru. *BMC Oral Health*. 2009;9(1):16.
4. Hadad Arrascue NLG, Del Castillo López CE. Determinantes sociales de salud y caries dental. *Odontol Pediátr*. 2011;10(1):13-21.
5. Carrasco Loyola M. Características socioeconómicas y salud bucal de escolares de instituciones educativas públicas. *Kiru*. 2015;6(2):78-83.
6. Watt RG. Social determinants of oral health inequalities: implications for action. *Community Dent Oral Epidemiol*. 2012;40(s2):44-8.
7. Petersen PE, Kwan S. Equity, social determinants and public health programmes – the case of oral health. *Community Dent Oral Epidemiol*. 2011;39(6):481-7.
8. Moysés SJ. Inequalities in oral health and oral health promotion. *Braz Oral Res*. 2012;26(S1):86-93.
9. Cooper AM, O'Malley LA, Elison SN, Armstrong R, Featherstone VA, Burnside G, et al. Primary school-based behavioural interventions for preventing caries. *Cochrane Database Syst Rev*. 2013; (5):CD009378.

10. Gillies P. Effectiveness of alliances and partnerships for health promotion. *Health Promot Int.* 1998;13(2):99-120.
11. Mitchell SM, Shortell SM. The Governance and Management of Effective Community Health Partnerships: A Typology for Research, Policy, and Practice. *The Milbank Q.* 2000;78(2):241-89.
12. Corbin JH, Mittelmark MB. Partnership lessons from the Global Programme for Health Promotion Effectiveness: a case study. *Health Promot Int.* 2008;23(4):365-71.
13. Adeleye OA, Ofili AN. Strengthening intersectoral collaboration for primary health care in developing countries: Can the health sector play broader roles? *J Environ Public Health.* 2010;2010.
14. Chiang RJ, Meagher W, Slade S. How the Whole School, Whole Community, Whole Child model works: creating greater alignment, integration, and collaboration between health and education. *J Sch Health.* 2015;85(11):775-84.
15. Shankardass K, Solar O, Murphy K, Greaves L, O'Campo P. A scoping review of intersectoral action for health equity involving governments. *Int J Public Health.* 2012;57(1):25-33.
16. Ndumbe-Eyoh S, Moffatt H. Intersectoral action for health equity: a rapid systematic review. *BMC Public Health.* 2013;13(1):1056.
17. Ministerio de Salud. Resolucion Ministerial - Gestion de la Estrategia Sanitaria Nacional de Salud Bucal. Lima, PE: El Peruano; 2007.
18. Presidente de la Republica. Aprueban Plan de Salud Escolar 2013-2016, con cargo al Presupuesto Institucional del Ministerio de Salud, del Seguro Integral de Salud y de los demas pliegos involucrados. Lima, PE: El Peruano; 2013. p. 10-20.

19. Dirección General de Promoción de la Salud. Módulo de Promoción de la Salud Bucal. Lima, PE: Ministerio de Salud; 2014.
29. Lazo Meneses GA. Problemática Actual en Salud Bucal en el Perú. *Scientiarvm*. 2017;3(2):55-8.
21. Espinoza-Usaqui EM, de María Pachas-Barrionuevo F. Programas preventivos promocionales de salud bucal en el Perú. *Rev Estomatol Herediana*. 2014;23(2):101-8.
22. Dirección Regional de Salud Cusco. Plan estratégico institucional 2009-2013. Cusco, PE: autor; 2009.
23. García Cabrera HE, Díaz Urteaga P, Ávila Chávez D, Cuzco Ruiz MZ. La Reforma del Sector Salud y los recursos humanos en salud. *An Fac Med*. 2015;76(SPE):7-26.
24. Pesaressi E, Villena RS, van der Sanden WJ, Frencken JE. Impact of Health Centre Nurses on the Reduction of Early Childhood Caries in Lima, Peru. *Br J Med Med Res*. 2015;5(9):1169-76.
25. Alcalde-Rabanal JE, Lazo-González O, Nigenda G. Sistema de salud de Perú. *Salud Publica Mex*. 2011;53(S2):s243-s54.
26. Bergeron DA, Talbot LR, Gaboury I. Realist evaluation of intersectoral oral health promotion interventions for schoolchildren living in rural Andean communities: A research protocol. *BMJ Open*. 2017;7(2).
27. Pawson R. *The science of evaluation: a realist manifesto*. London, UK: Sage; 2013. 216 p.
28. Pawson R, Manzano-Santaella A. A realist diagnostic workshop. *Evaluation*. 2012;18(2):176-91.

29. Bergeron DA, Talbot LR, Gaboury I. Context and the mechanisms in intersectoral school-based health promotion interventions: A critical interpretative synthesis. *Health Educ J.* 2019.
30. Bergeron DA. *Évaluation réaliste d'interventions intersectorielles de promotion de la santé buccodentaire destinées aux enfants d'âge scolaire vivant dans des communautés rurales andines.* Sherbrooke, QC: Université de Sherbrooke; 2019.
31. Bergeron DA, Ricalde Chacón JN, Talbot LR, Gaboury I. Oral health status of schoolchildren living in remote rural Andean communities: a cross-sectional study. *J Rural Health.* Submitted.
32. de Souza DE. Elaborating the Context-Mechanism-Outcome configuration (CMOc) in realist evaluation: a critical realist perspective. *Evaluation.* 2013;19(2):141-54.
33. Miles MB, Huberman AM, Saldaña J. *Qualitative data analysis: A methods sourcebook.* New York, NY: Sage; 2013.
34. Mack N, Woodsong C, MacQueen KM, Guest G, Namey E. *Qualitative Research Methods: A Data Collector's Field Guide.* Research Triangle Park, NC: Family Health International; 2005.
35. Manzano A. The craft of interviewing in realist evaluation. *Evaluation.* 2016;22(3):342-60.
36. Hsieh H-F, Shannon SE. Three approaches to qualitative content analysis. *Qual Health Res.* 2005;15(9):1277-88.
37. Santos HP, Black AM, Sandelowski M. Timing of translation in cross-language qualitative research. *Qual Health Res.* 2014;25(1):134-44.

38. Oliver DP. Rigor in Qualitative Research. *Res Aging*. 2011;33(4):359-60.
39. Robins CS, Eisen K. Strategies for the effective use of NVivo in a large-scale study: Qualitative analysis and the repeal of Don't Ask, Don't Tell. *Qual Inq*. 2017;23(10):768-78.
40. Jackson SF, Kolla G. A New Realistic Evaluation Analysis Method Linked Coding of Context, Mechanism, and Outcome Relationships. *Am J Eval*. 2012;33(3):339-49.
41. Dalkin SM, Forster N, Hodgson P, Lhussier M, Carr S. The NVivo Blog [Internet] 2015.
42. Astbury B, Leeuw FL. Unpacking black boxes: mechanisms and theory building in evaluation. *Am J Eval*. 2010;31(3):363-81.
43. Hawe P, Shiell A, Riley T. Theorising interventions as events in systems. *Am J community Psychol*. 2009;43(3-4):267-76.
44. Jagosh J, Bush PL, Salsberg J, Macaulay AC, Greenhalgh T, Wong G, et al. A realist evaluation of community-based participatory research: partnership synergy, trust building and related ripple effects. *BMC Public Health*. 2015;15(1):725.
45. Kok MO, Vaandrager L, Bal R, Schuit J. Practitioner opinions on health promotion interventions that work: Opening the 'black box' of a linear evidence-based approach. *Soc Sci Med*. 2012;74(5):715-23.
46. Abernethy P. Bridging conceptual "silos": bringing together health promotion and sustainability governance for practitioners at the landscape scale. *Local Environ*. 2016;21(4):451-75.

47. Harnagea H, Couturier Y, Shrivastava R, Girard F, Lamothe L, Bedos CP, et al. Barriers and facilitators in the integration of oral health into primary care: a scoping review. *BMJ Open*. 2017;7:e016078.
48. Amarasena N, Kapellas K, Skilton MR, Maple-Brown LJ, Brown A, Bartold M, et al. Factors associated with routine dental attendance among aboriginal Australians. *J Health Care Poor Underserved*. 2016;27(1):67-80.
49. Curtis DC, Ortega F, Monar J, Bay RC, Eckhart S, Thompson P. Assessing self-reported oral health status of three Andean indigenous communities in Ecuador. *J Int Oral Health*. 2017;9(5):207.
50. Skillman SM, Doescher MP, Mouradian WE, Brunson DK. The challenge to delivering oral health services in rural America. *J Pub Health Dent*. 2010;70(S1):S49-S57.
51. Shelley D, Mevi A, Abu-Rish E, Haber J, Hirsch S. Preliminary steps toward creating an interprofessional international public health program. *J Interprof Care*. 2009;23(4):417-9.
52. Coll AM, Richards W, Filipponi T. Exploring parents' and teachers' perceptions of promoting oral health in children. *Br J Sch Nurs*. 2017;12(4):178-85.
53. López del Valle LM, Riedy CA, Weinstein P. Rural Puerto Rican women's views on children's oral health: a qualitative community-based study. *J Dent Child*. 2005;72(2):61-6.
54. White D. Development of a rural health framework: Implications for program service planning and delivery. *Healthc Policy*. 2013;8(3):27-41a.

55. Bourke L, Sheridan C, Russell U, Jones G, DeWitt D, Liaw ST. Developing a conceptual understanding of rural health practice. *Austr J Rural Health*. 2004;12(5):181-6.
56. Sheiham A, Watt RG. The common risk factor approach: a rational basis for promoting oral health. *Community Dent Oral Epidemiol*. 2000;28(6):399-406.
57. Kay E, Locker D. A systematic review of the effectiveness of health promotion aimed at improving oral health. *Community Dent. Health*. 1998;15(3):132-44.
58. Vallejos-Sánchez AA, Medina-Solís CE, Maupomé G, Casanova-Rosado JF, Minaya-Sánchez M, Villalobos-Rodelo JJ, et al. Sociobehavioral factors influencing toothbrushing frequency among schoolchildren. *J Am Dent Assoc*. 2008;139(6):743-9.
59. Abadía-Barrero CE, Martínez-Parra AG. Care and consumption: A Latin American social medicine's conceptual framework to comprehend oral health inequalities. *Glob Public Health*. 2016;12(10):1228-41.
60. Changkakoti N, Gremion M, Broyon M-A, Gajardo A. Terrains de recherche au «prisme interculturel de la traduction». *Alterstice*. 2012;2(1):41-54.

Table 1

Types of participants

Types of participants	Sample (n=59)					
	Regional capital	Province capital	District capital	Remote rural community 1	Remote rural community 2	Remote rural community 3
OH professional	-	-	1	-	-	-
Teachers	-	-	-	3	2	3
Parents	-	-	-	7	5	13
Health administrators	3	-	-	-	-	-
Local education administrator	-	1	-	-	-	-
Other local stakeholders	-	-	-	8	6	7

Figure 1: Context-Mechanism-Outcomes configurations for OHP interventions with schoolchildren living in remote rural Andean communities

