

Food Perceptions and Dietary Changes for Chronic Condition Management in Rural Peru: Insights for Health Promotion

Silvana Perez-Leon ^{1,*}, M. Amalia Pesantes ¹, Nathaly Aya Pastrana ², Shivani Raman ³, Jaime Miranda ¹ and L. Suzanne Suggs ²

¹ CRONICAS Center of Excellence in Chronic Diseases, Universidad Peruana Cayetano Heredia, Lima 15074, Peru; maria.pesantes.v@upch.pe (M.A.P.); jaime.miranda@upch.pe (J.M.)

² BeCHANGE Research Group, Institute of Public Communication, Università della Svizzera italiana, Lugano 6900 Switzerland; nathaly.aya.pastrana@usi.ch (N.A.P.); suzanne.suggs@usi.ch (L.S.S.)

³ Department of Sociology, Rice University, Houston, TX 77005, USA; sir3@rice.edu

* Correspondence: silvanaplq@gmail.com; Tel.: + 51 1 241 6978

Original and complete manuscript published: *Nutrients* 2018, 10, 1563; doi:10.3390/nu10111563

Abstract: Peru is undergoing a nutrition transition and, at the country level, it faces a double burden of disease where several different conditions require dietary changes to maintain a healthy life and prevent complications. Through semistructured interviews in rural Peru with people affected by three infectious and noninfectious chronic conditions (type 2 diabetes, hypertension, and neurocysticercosis), their relatives, and focus group discussions with community members, we analyzed their perspectives on the value of food and the challenges of dietary changes due to medical diagnosis. The findings show the various ways in which people from rural northern Peru conceptualize good (*buena alimentación*) and bad (*mala alimentación*) food, and that food choices are based on life-long learning, experience, exposure, and availability. In the context of poverty, required changes are not only related to what people recognize as healthy food, such as fruits and vegetables, but also of work, family, trust, taste, as well as affordability and accessibility of foods. In this paper we discuss the complexity of introducing dietary changes in poor rural communities whose perspectives on food are poorly understood and rarely taken into consideration by health professionals when promoting behavior change.

Keywords: dietary changes; health promotion; health behavior; Peru; chronic conditions

1. Introduction

Over the past several decades, low- and middle-income countries (LMICs) have experienced a nutrition transition. Countries that have faced hunger and malnutrition as their main concerns are now confronting an additional problem of overweight and obesity and are experiencing increasing rates of noncommunicable diseases (NCD) such as diabetes and hypertension [1]. Additionally, LMICs are still struggling to reduce the incidence of infectious diseases that are often caused by contaminated food or poor hygiene practices. One example is neurocysticercosis (NCC), a neglected tropical disease (NTD) characterized by parasitic infection of the brain that primarily affects the poor [2].

Type 2 diabetes (T2D) and hypertension (HT) require dietary changes to manage the conditions and though patients with NCC do not require specific changes in their diet, its prevention has a close relation with the consumption of uncooked pork and poor sanitary practices. The control of NCC requires breaking the life cycle of the *Taenia solium* [3], where the main intervention to stop transmission in LMICs is improving sanitary practices [4,5]. The prevention of both NCDs and NCC share the need to promote changes in dietary habits in the population.

Most studies in LMICs have addressed the problem of nutrition transition from the perspective of accessibility and affordability [6–9] but nutrition is a complex issue since what people eat is not only about nutritional value, as food choices and preferences are influenced by many factors [10]. The cultural and social contexts in which individuals are brought up, live, and work have a strong influence on the food choices made, as they affect their views of foods and eating behaviors [10]. Diet is also an important aspect of social life and is related with sharing, belonging to a group, and celebration [11]. Thus, promoting and supporting dietary changes requires a thorough understanding of local cultural norms, values, beliefs, and practices that underlie certain unhealthy habits [12].

In this study, we examine the perspectives on the value of food and the challenges of dietary changes among people living with T2D, HT, and/or NCC from four rural communities in Northern Peru. We contrast and compare local perspectives of what and why a particular food item is perceived as “good” or “bad”. Our findings are particularly relevant for culturally appropriate design of health promotion aiming to achieve the U.N. Sustainable Development Goals for ending all forms of malnutrition and ensuring healthy lives.

2. Study Design and Site

The study is part of a multicountry research for development project that aims to address the health challenges faced in low- and middle-income countries as a result of the double burden that NTDs and NCDs place on local health systems [13].

The data were collected as part of a qualitative study aimed at understanding local health perceptions and use of health facilities of people with chronic conditions and other community dwellers. Data were collected through semistructured interviews (to caregivers, head of households, people living with T2D, HT, and/or NCC) and focus group discussions (with community dwellers) using a predetermined set of questions and complemented with field notes. This analysis utilized the data related to local dietary habits and changes in the patient's life due to the disease.

All data were collected in the province of Ayabaca, located in the highlands of the Piura region in northern Peru. Ayabaca is divided into 10 districts and has an approximate population of 140,000 (Information is gathered in 2015) [14], with 73% of the population living in poverty (Information is gathered in 2009) [14]. Two rural communities and their district's capital towns were selected for this study: Pingola (Ayabaca district) and Sicacate (Montero district). The main economic activity in both communities is agriculture. Men predominately work as agricultural farmers, while women work as housewives (cooking, cleaning, caring for children, etc.) and in some cases, manage small shops (*bodegas*).

3. Main Findings

Our study shows the various ways in which people from rural northern Peru value food and the multiplicity of factors that play a role in identifying food as good/healthy or not. Understanding food- and diet-related contexts like the one in Ayabaca, and similar rural settings facing a nutritional transition, and the complexity attached to it, is fundamental to end all forms of malnutrition (encompassing both undernutrition and overnutrition) and promoting healthy lifestyles and well-being for all and throughout the life course, as proposed by the sustainable development goals 2 and 3 [15].

Our study highlights the challenges of dietary changes in patients with chronic conditions in a rural area and the relevance of understanding the local context. In the communities where we conducted this study, perceptions of *buena* and *mala alimentación* are strongly linked to the extent to which foods enable individuals to perform day-to-day tasks and activities, and this finding is consistent with other studies in Peru [16]. For this reason, individuals are accustomed to consuming high-carbohydrate foods such as rice, potato, corn, and grains, often in large portion sizes. On the other hand, there is conflict between the people recognizing vegetables and fruits as “good” food, and the insufficient consumption of these fruits and vegetables because they are not available or are not affordable. As other studies have reported [17,18], we also found that when foods are not

available within the community, participants do not buy them outside due to negative perceptions about consuming food from an unknown source. Yet, there is an increasing consumption of cheap processed foods, such as noodles.

Our findings show the complexity of introducing dietary changes in rural communities where the perspectives on food are poorly understood and rarely taken into consideration when promoting food- or diet-related behavior change. T2D and HT are diseases for which much of their management can occur in the community, at the primary care level, and where the prevention of NCC needs adequate control at the community as well. So the food people intake will have consequences in the management of their disease or in the prevention of new diseases.

For patients with T2D, HT, and NCC, following dietary recommendations received by health professionals is challenging. On the one hand, people have difficulties not being able to eat food they like, the food they grew up with, the food that they perceive as nutritious or tasteful, nor eat certain foods in the quantities they are used to. On the other hand, the food recommended by the health professionals are things they do not like to eat. Furthermore, diet modifications involve negotiation or arrangements with the family, which is key to successfully adapt to the recommended diet [19]. In this sense, involving the family is a key element for dietary modifications. As Vanstone and colleagues show in their review, “support at home is universally described as an essential component of successful dietary modification” [20,21]. Patients in our study know and say they make dietary modifications, but the compliance of healthy dietary practices seems more complex to accomplish. As what is reported in other studies [20,21], making dietary changes recommended by health professionals is challenging. This study helps understand how dietary recommendations for chronic conditions in rural agrarian communities need to be reconciled with working conditions, access to food, perceptions of food, and family.

Our results align with some crosscutting themes such as food availability, introducing dietary changes, and health promotion. What people eat, especially what poor people eat, is not only about what people identify as healthy, but the availability of such foods. Food availability is one of the four pillars of food security [22]. Thus, a poor person’s socioeconomic status can exert a strong influence on food choice behaviors [23–25]. It is necessary to transform food systems into sustainable and sensitive nutrition systems that will provide a variety of healthy foods, devoting special attention to the most vulnerable [6].

The availability of cheap unhealthy choices is a growing problem in many LMICs [26–28] and it is also happening in rural Peru [29]. Understanding local eating habits must take into account the role of structural factors on food choices [30]. Thus, our study supports the finding that individual choices, especially those of the poor, are influenced by broader social and environmental factors [25,31].

Our findings are consistent with studies across the globe that show that knowledge is not enough to influence behavior [32–34]. Theories of human behaviors, such as eating behavior, suggest that a combination of environmental and personal factors influence behavior [35]. Environmental factors include cultural determinants (e.g., nationality, ethnicity, identity), physical (e.g., policies, availability, accessibility), and social (e.g., parental behavior, peer influence, advertisement exposure) [36]. Personal determinants, such as liking and preference, are the strongest determinants of diet habits [37–39]. Introducing, achieving, and sustaining healthier dietary changes will require a combination of all those factors, beyond availability and affordability.

This study highlights that patients, caregivers, and community members living in rural Peru have reasonable knowledge of what a healthy diet consists of, yet making food choices is a complex issue influenced by work, family, trust, taste, as well as affordability and accessibility. It also highlights that perceptions of the value of certain foods are not necessarily consistent with the advice received about healthy diet from health educators and health workers. Health promotion efforts therefore must include not only factual information about nutrients, but also provide opportunities to taste new foods, cook in new ways that are sustainable, and learn about what foods and vendors from outside the community are prepared in ways that respect local preferences. For example, it would be beneficial for health professionals to have a good idea of what foods are produced locally

in order to recommend these items in the diet, but also to provide a clear understanding of the relationship between what a person needs versus how much is needed, in accordance with their daily activities (i.e., caloric expenditure).

5. Conclusions

This study shows the important influence of culture and social conditions on food perceptions and dietary changes in rural Peru. The findings highlight that poor people in rural northern Peru, just like others across the globe, make decisions and have knowledge about food that are based on life-long learning, experience, exposure, and availability. The study also stresses that knowledge alone does not influence eating behavior and that making dietary change is difficult. Thus, promoting healthy diets without contextualizing information and recommendations is sure to produce suboptimal results. Health promotion focused on nutrition for rural, poor communities must take into account the activities of daily life, access and affordability of foods, but also food taste preferences and traditions.

Funding: This research was funded under the r4d Public Health call of the Swiss Programme for Research on Global Issues for Development by the Swiss National Science Foundation and the Swiss Development Cooperation grant number 40P740_160366/1.

Acknowledgments: We want to thank David Beran, who provided critical feedback on earlier versions of the manuscript and whose encouragement was key to complete the manuscript.

Conflicts of Interest: The authors declare no conflict of interest. The funders had no role in the design of the study; in the collection, analyses, or interpretation of data; in the writing of the manuscript, and in the decision to publish the results.

References

1. Popkin, B.M.; Adair, L.S.; Ng, S.W. Global nutrition transition and the pandemic of obesity in developing countries. *Nutr. Rev.* **2012**, *70*, 3–21, doi:10.1111/j.1753-4887.2011.00456.x.
2. Moyano, L.M.; O’Neal, S.E.; Ayvar, V.; Gonzalez, G.; Gamboa, R.; Vilchez, P.; Rodriguez, S.; Reistetter, J.; Tsang, V.C.W.; Gilman, R.H. et al. High Prevalence of Asymptomatic Neurocysticercosis in an Endemic Rural Community in Peru. *PLoS Negl. Trop. Dis.* **2016**, *10*, e0005130, doi:10.1371/journal.pntd.0005130.
3. Maurice, J. Of pigs and people—WHO prepares to battle cysticercosis. *Lancet* **2014**, *384*, 571–572, doi:10.1016/S0140-6736(14)61353-2.
4. Summary of the twenty-first meeting of the international task force for disease eradication (II). Available online: http://www.cartercenter.org/resources/pdfs/news/health_publications/itfde/ITFDE-summary-071013.pdf. (accessed on 7 February 2018).
5. Wielinga, P.R.; Schlundt, J. Food Safety: At the center of a One Health approach for combating zoonoses. *Curr. Top. Microbiol. Immunol.* **2013**, *366*, 3–17, doi:10.1007/82_2012_238.
6. Panorama de la seguridad alimentaria y nutricional en América Latina y el Caribe. Available online: <http://www.fao.org/3/a-i7914s.pdf> 2017 (accessed on 6 September 2018)
7. Ortiz-Hernández, L.; Delgado-Sánchez, G.; Hernández-Briones, A. Cambios en factores relacionados con la transición alimentaria y nutricional en México. *Gaceta Médica De México* **2006**, *142*, 181–193.
8. Sánchez, L.S.I.; Ibarra, L.S.V.; Bernal, V.G.; Guerrero, F.H. Transición Alimentaria en México. *Razón Y Palabra* **2016**, *58*, 568–573.
9. Peña, M.; Bacallao, J. *La obesidad en la pobreza: Un nuevo reto para la salud pública*; PAO: Washington, WA, USA, 2000; ISBN 978-92-75-31576-7.
10. Shepherd, R. Social determinants of food choice. *Proc. Nutr. Soc.* **1999**, *58*, 807–812, doi:10.1017/S0029665199001093.
11. Mintz, S.W.; Bois, C.M.D. The Anthropology of Food and Eating. *Annu. Rev. Anthropol.* **2002**, *31*, 99–119.

12. Dickey, M.K.; John, R.; Carabin, H.; Zhou, X.-N. Focus group discussions among the Bai in China to inform a social marketing campaign for sanitation promotion. *J. Water Sanit. Hyg. Dev.* **2016**, *6*, 121–131, doi:10.2166/washdev.2016.064.
13. Tackling NCDs and NTDs: The COHESION approach to addressing the SDGs. Health Network Shareweb of the Swiss Agency for Development and Cooperation SDC. Available online: <https://www.shareweb.ch/site/Health/aboutus/Pages/Contributions-January-2018/Tackling-NC-Ds-and-NTDs.aspx> (accessed on 4 September 2018).
14. PERÚ Instituto Nacional de Estadística e Informática 2015. Available online: <https://www.inei.gob.pe/> (accessed on 4 July 2018).
15. Transforming our World: The 2030 Agenda for Sustainable Development. Available online: <http://undocs.org/A/RES/70/1> (accessed on 4 September 2018).
16. Pesantes, M.A.; Diez-Canseco, F.; Bernabé-Ortiz, A.; Ponce-Lucero, V.; Miranda, J.J. Taste, Salt Consumption, and Local Explanations around Hypertension in a Rural Population in Northern Peru. *Nutrients* **2017**, *9*, doi:10.3390/nu9070698.
17. Lipus, A.C.; Leon, J.S.; Calle, S.C.; Andes, K.L. “It Is Not Natural Anymore”: Nutrition, Urbanization, and Indigenous Identity on Bolivia’s Andean Plateau. *Qual. Health Res.* **2018**, 1049732318761862, doi:10.1177/1049732318761862.
18. Garro, L.C. Intracultural variation in causal accounts of diabetes: A comparison of three Canadian Anishinaabe (ojibway) communities. *Cult. Med. Psych.* **1996**, *20*, 381–420, doi:10.1007/BF00117086.
19. Pesantes, M.A.; Del Valle, A.; Diez-Canseco, F.; Bernabé-Ortiz, A.; Portocarrero, J.; Trujillo, A.; Cornejo, P.; Manrique, K.; Miranda, J.J. Family Support and Diabetes: Patient’s Experiences From a Public Hospital in Peru. *Qual. Health Res.* **2018**, *28*, doi:10.1177/1049732318784906.
20. Vanstone, M.; Rewegan, A.; Brundisini, F.; Giacomini, M.; Kandasamy, S.; DeJean, D. Diet modification challenges faced by marginalized and nonmarginalized adults with type 2 diabetes: A systematic review and qualitative meta-synthesis. *Chronic Illn.* **2017**, *13*, 217–235, doi:10.1177/1742395316675024.
21. Vanstone, M.; Giacomini, M.; Smith, A.; Brundisini, F.; DeJean, D.; Winsor, S. How diet modification challenges are magnified in vulnerable or marginalized people with diabetes and heart disease: A systematic review and qualitative meta-synthesis. *Ont. Health Technol Assess. Ser.* **2013**, *13*, 1–40.
22. Power, E.M. Conceptualizing Food Security for Aboriginal People in Canada. *Can. J. Public Health* **2008**, *99*, 95–97.
23. Drewnowski, A.; Rolls, B.J. *Obesity Treatment and Prevention: New Directions*. Karger Publishers: Basel, Switzerland, 2012.
24. O’Neill, M.; Rebane, D.; Lester, C. Barriers to healthier eating in a disadvantaged community. *Health Educ. J.* **2004**, *63*, 220–228, doi:10.1177/001789690406300303.
25. Irala-Estévez, J.D.; Groth, M.; Johansson, L.; Oltersdorf, U.; Prättälä, R.; Martínez-González, M.A. A systematic review of socio-economic differences in food habits in Europe: Consumption of fruit and vegetables. *Eur. J. Clin. Nutr.* **2000**, *54*, 706–714.
26. Stuckler, D.; McKee, M.; Ebrahim, S.; Basu, S. Manufacturing epidemics: The role of global producers in increased consumption of unhealthy commodities including processed foods, alcohol, and tobacco. *PLoS Med.* **2012**, *9*, e1001235, doi:10.1371/journal.pmed.1001235.
27. Doak, C.M.; Adair, L.S.; Monteiro, C.; Popkin, B.M. Overweight and Underweight Coexist within Households in Brazil, China and Russia. *J. Nutr.* **2000**, *130*, 2965–2971, doi:10.1093/jn/130.12.2965.
28. Monteiro, C.A.; Conde, W.L.; Popkin, B.M. Income-Specific Trends in Obesity in Brazil: 1975–2003. *Am. J. Public Health* **2007**, *97*, 1808–1812, doi:10.2105/AJPH.2006.099630.
29. Díaz, V.R. *Análisis económico de la ingesta de alimentos en el Perú: Informe final*; Instituto de Estudios Peruanos: Lima, Peru, 2010.
30. Attree, P. Low-income mothers, nutrition and health: A systematic review of qualitative evidence. *Matern. Child Nutr.* **2005**, *1*, 227–240, doi:10.1111/j.1740-8709.2005.00022.x.

31. Committee on Preventing the Global Epidemic of Cardiovascular Disease: Meeting the Challenges in Developing Countries. *Promoting Cardiovascular Health in the Developing World: A Critical Challenge to Achieve Global Health*; National Academies Press, Washington, WA, USA, 2010; ISBN 978-0-309-14774-3.
32. Rothman, A.J.; Gollwitzer, P.M.; Grant, A.M.; Neal, D.T.; Sheeran, P.; Wood, W. Hale and Hearty Policies: How Psychological Science Can Create and Maintain Healthy Habits. *Perspect. Psychol. Sci.* **2015**, *10*, 701–705.
33. Gupta, A.; Smithers, L.G.; Harford, J.; Merlin, T.; Braunack-Mayer, A. Determinants of knowledge and attitudes about sugar and the association of knowledge and attitudes with sugar intake among adults: A systematic review. *Appetite* **2018**, *126*, 185–194, doi:10.1016/j.appet.2018.03.019.
34. Wardle, J.; Parmenter, K.; Waller, J. Nutrition knowledge and food intake. *Appetite* **2000**, *34*, 269–275, doi:10.1006/appe.1999.0311.
35. Rasmussen, M.; Krølner, R.; Klepp, K.-I.; Lytle, L.; Brug, J.; Bere, E.; Due, P. Determinants of fruit and vegetable consumption among children and adolescents: A review of the literature. Part I: Quantitative studies. *Int. J. Behav. Nutr. Phys. Act.* **2006**, *3*, 22, doi:10.1186/1479-5868-3-22.
36. Sorokowska, A.; Pellegrino, R.; Butovskaya, M.; Marczak, M.; Niemczyk, A.; Huanca, T.; Sorokowski, P. Dietary customs and food availability shape the preferences for basic tastes: A cross-cultural study among Polish, Tsimane' and Hadza societies. *Appetite* **2017**, *116*, 291–296, doi:10.1016/j.appet.2017.05.015.
37. Drewnowski, A. Taste Preferences and Food Intake. *Annu. Rev. Nutr.* **1997**, *17*, 237–253.
38. Blanchette, L.; Brug, J. Determinants of fruit and vegetable consumption among 6–12-year-old children and effective interventions to increase consumption. *J. Human Nutr. Diet.* **2005**, *18*, 431–443, doi:10.1111/j.1365-277X.2005.00648.x.
39. Haß, J.; Hartmann, M. What determines the fruit and vegetables intake of primary school children?—An analysis of personal and social determinants. *Appetite* **2018**, *120*, 82–91, doi:10.1016/j.appet.2017.08.017.



© 2018 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<http://creativecommons.org/licenses/by/4.0/>).