

“Relationship between the family and community health care model in the Chilean public primary care, and patients’ satisfaction on how they were treated in 2015; A nationwide study”

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## **Abstract**

Relationship between the family and community health care model in the Chilean public primary care, and patients' satisfaction on how they were treated in 2015; a nationwide study

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**Background:** Primary care based health care systems are essential for every nation. In 2005, Chile embraced the Family and Community' Comprehensive Health Care Model (or MAIS) to strengthen the primary care and started to measure its development in 2015 using the "MAIS" assessment tool, created for this purpose. One of the expected outcomes of this model is a higher satisfaction with the interactions with the staff and since 2014, a nationwide survey called TU-APS, measures it for the complete public health care system. The current study aims to establish if a relationship exists between the family centered health care model in the Chilean public health care model, as measured by the MAIS tool, and its user's satisfaction, measured by the TU-APS.

**Sample:** using 2015 countrywide data, the sample considers 438 large General Urban Centers (GUC), 46 General Rural Centers (GRC) from concentrated areas, and 19 Community Hospitals (CH), obtaining data from 503 centers.

**Methods:** In this secondary data analysis, a cross-sectional non-experimental design was in place, using data already collected by the Ministry of Health.

**Results:** According to the TU-APS national survey results, in average, the users of the primary care in Chile evaluated very positively how they are treated in their encounters with the staff (In as scale from 1 to 7, median of 6.453, 95% CI 6.424- 6.481). For the MAIS assessment, in a 1 to 100 scale, a median of

55.57 (95% CI 54.2-57.0) showed a normal distribution. Differences between the type of center and the TU-APS national survey (Kruskal-Wallis test,  $\chi^2=24.747$ ,  $p<0.001$ ) and the MAIS assessment was found (Chi-square=22.315,  $p<0.001$ ), but only because the difference between the CH and the other two groups. When the correlation between the TU-APS survey and the MAIS assessment was tested, a small inverse relation was found (Spearman Rho,  $r= -0.1119$ ,  $p = 0.0117$ ), i.e. the highest the MAIS evaluation, the lower the results in the TU-APS survey. Possible causes for these findings are discussed.

**Conclusions:** These results don't confirm the expected relation between the patients' satisfaction and the advancement of the MAIS model in the Chilean primary care. This could have implications on policies evaluating primary care patient's satisfaction

## Table of Contents

Abstract.....	3
I. Introduction .....	6
Primary care based health system .....	6
Family Medicine .....	6
II. Background .....	8
Patients experience, satisfaction and system responsiveness .....	8
III. Aims.....	18
IV. Methods.....	18
Data collection .....	18
Variables included.....	19
Sample selection .....	21
Data Analysis.....	23
Ethics.....	24
V. Results.....	25
VI. Discussion.....	29
Limitations.....	31
VII. Conclusions .....	34
VIII. References .....	35
IX. Appendix.....	39

## **I. Introduction**

### **Primary care based health system**

Primary care based healthcare systems are essential for every nation, being one the principles stated by the World Health Organization (1996) in the Ljubljana Charter, as health systems should be oriented to rely on them. Care provided at the primary level is globally effective at targeting preventable diseases and maternal mortality (Rhode et al, 2008). The alarming and increasing problem of chronic preventable diseases have become a larger burden to health care systems. Currently, dietary risks, followed by elevated systolic blood pressure (SBP) were the two leading global health risk included as burden of disease in 2015 (IHME, 2017; Forouzanfar et al, 2017).

### **Family Medicine**

In Chile, a health system reform started in 1992, (Téllez, 2006), when the nation's policy makers impelled a different health care model, deciding to shift toward a primary care delivery based system, in line with 1963 Alma Ata declaration paradigm. A new model to follow and implement was declared, named Family and Community' Comprehensive Health Care Model (Modelo de Atención Integral de Salud Familiar y Comunitario) or MAIS, an acronym of the first words in Spanish. This new model aimed for three main shifts: the aforementioned health care attention model focused in the family and the communities, primary care strengthening and systems integration around health care networks (Ministry of Health of Chile, MINSAL, 2005). This family and community orientation is guided by the principles stated in the Alma Ata declaration, and has been followed throughout all the Americas (Gofin & Gofin, 2007).

This nation level change aimed for a difference in how the patients and their problems were conceived and how healthcare was provided, passing from a more individual, disease oriented approach, to a broader view of the person's needs, considering his/her context, including those of the

community in which he/she is embedded (family, neighborhood) and also the social determinants, trying to implement a more preventive and efficient healthcare model. This was also called the shift from a biomedical health care model to a biopsychosocial one.

After several years in which laws, norms and technical orientations were created (MINSAL, 2005, 2006 & 2015), a new way to measure this shift was instated. Starting in 2014, Chilean primary care settings should be evaluated using a 24- item certification checklist, having as a result a three tier implementation levels of this intended model of health delivery. That same year a local group of experts was summoned by the local Health Ministry and started creating a larger and deeper evaluation. This new evaluation tool was placed in 2015, the MAIS assessment , comprised by a total of 75 items (see Appendix 2), organized in 9 domains tool was generated, getting to the requirements for every primary healthcare center to implement the new model. Data is now available for most of the Chilean primary care centers, with a measurement of the level of implementation of the Family and Community Centered model.

The relevance of this policy is high, as it was shown recently in the preliminary results of the Chilean National Health Survey 2016-2017 (Ministry of Health of Chile, MINSAL, 2017), performed every five years and with national representation that includes laboratories exams, shown a 12% of the population with indicators of Diabetes, 28% with High Blood Pressure, low presence of health protective factors and a strong impact of the social determinants of health, being the Primary Health Care the key actor to impact and reduce the increasing burden of the non-communicable diseases.

## II. Background

### **Patients experience, satisfaction and system responsiveness**

The case for the consideration of the patient experiences with the health care as a pillar of quality is often justified on grounds of its intrinsic value—that the expectation of humane, empathic care is requires no further justification” (Doyle, Lennox & Bell, 2013). This is in line with the provision of a patient-centered care, a key element of a high-quality health care system (Corrigan, Donaldson & Kohn, 2001).

Although many times contradicting outcomes in its association with other health metrics are found, there seems to be a consistent trend indicating that better patient care experiences and satisfaction is “associated with higher levels of adherence to recommended prevention and treatment processes, better clinical outcomes, better patient safety within hospitals, and less health care utilization” (Manary et al, 2013). These findings, as well an increase in preventive domains as health promoting behaviors like the use of screening services and immunizations, have been confirmed in a systematic review (Doyle, Lennox & Bell, 2013), in developing countries in maternal care with indigenous population (Colombara, et al, 2016), and with large national surveys (Fan et al 2005, Fenton et al 2012, in the US; Price et al, 2014 in England).

As will be explored next, three main conceptualizations have evolved in the field of how the user experience that care, both with the medical and non-medical interaction with the system; patient’s satisfaction, patients experience with health care, and health care system responsiveness.

### ***Patients satisfaction with care***

Satisfaction can be defined as the subjective comparison between expectations and perceptions of service performance (Fournier & Mick, 1999, in Almeida, Bourliataux-Lajoinie & Martins, 2015), and it

tries to capture consumer perceptions of the quality of services delivered by a health provider or the system as a whole (AHRQ, 1999, in

One of the first authors to consider the patients satisfaction with care in the context of quality improvement was A. Donabedian, and since then is considered an important outcome measure, being “useful in assessing consultation and patterns of communication, as also patient feedback can be used systematically to choose between alternative methods of organizing or providing health care” (Fitzpatrick, 1991).

One of the conceptual models that came originally from business and quality improvement that was adapted for the health care sector was the SERVQUAL framework (Parasuraman, Zeithaml, and Berry 1986, in Babakus & Mangold, 1992), still in use in several patient’ satisfaction studies (e.g. Feldman et al 2017; Yakob & Ncama, 2017) including the Chilean assessment subject to this research . This framework tried to assess the gaps between client’s expectations and perceptions in the next five domains;

**Figure 1 SERVQUAL framework**

<b>Tangibles</b>	•Physical facilities, equipment, and appearance of personnel
<b>Reliability</b>	•Ability to perform the promised service dependably and accurately
<b>Responsiveness</b>	•Willingness to help customers and provide prompt service
<b>Assurance</b>	•Knowledge and courtesy of employees and their ability to inspire trust and confidence
<b>Empathy</b>	•Caring, the individualized attention the firm provides its customers (Babakus & Mangold, 1992)

More recently patients satisfaction measurement has included three domains; patient-professional interactions (as clinical skill, rapport and health-related communication behavior), physical environment and internal management processes (Almeida, Bourliataux-Lajoinie & Martins, 2015)

Measuring patient's satisfaction can face important problems, according to a report from the York Health Economics Consortium (2015) generated for the National Health Services in England;

“This concept has been frequently criticized as patients commonly report high levels of satisfaction with the quality of service provided (irrespective of the actual quality) due to a “gratitude bias” and other factors [...] Service evaluations based on patient satisfaction ratings may consequently provide a false impression, and are therefore lacking in validity and utility”

This halo effect, or “misjudgments arising from patients' reliance on perceptions based on surrogate indicators” has been pointed out as one of the problems measuring patient's satisfaction very early on (Fitzpatrick, 1991). As a response, two concepts related to aspects of the patient encounter and interaction with the health care system arose as research topic, a narrow one, the patient experience, and a broader one in scope, the system responsiveness.

### *Patients experience*

Patients experience is defined as “the sum of all interactions, shaped by an organization's culture, that influence patient perceptions, across the continuum of care” (Wolf, 2014) and the patient-reported experience measures (PREM) as those who “Measure patients perceptions of their experience of care by focusing on the process of care and how that has an impact on their experience” (Organization for Economic Co-Operation and Developments OECD, 2017).

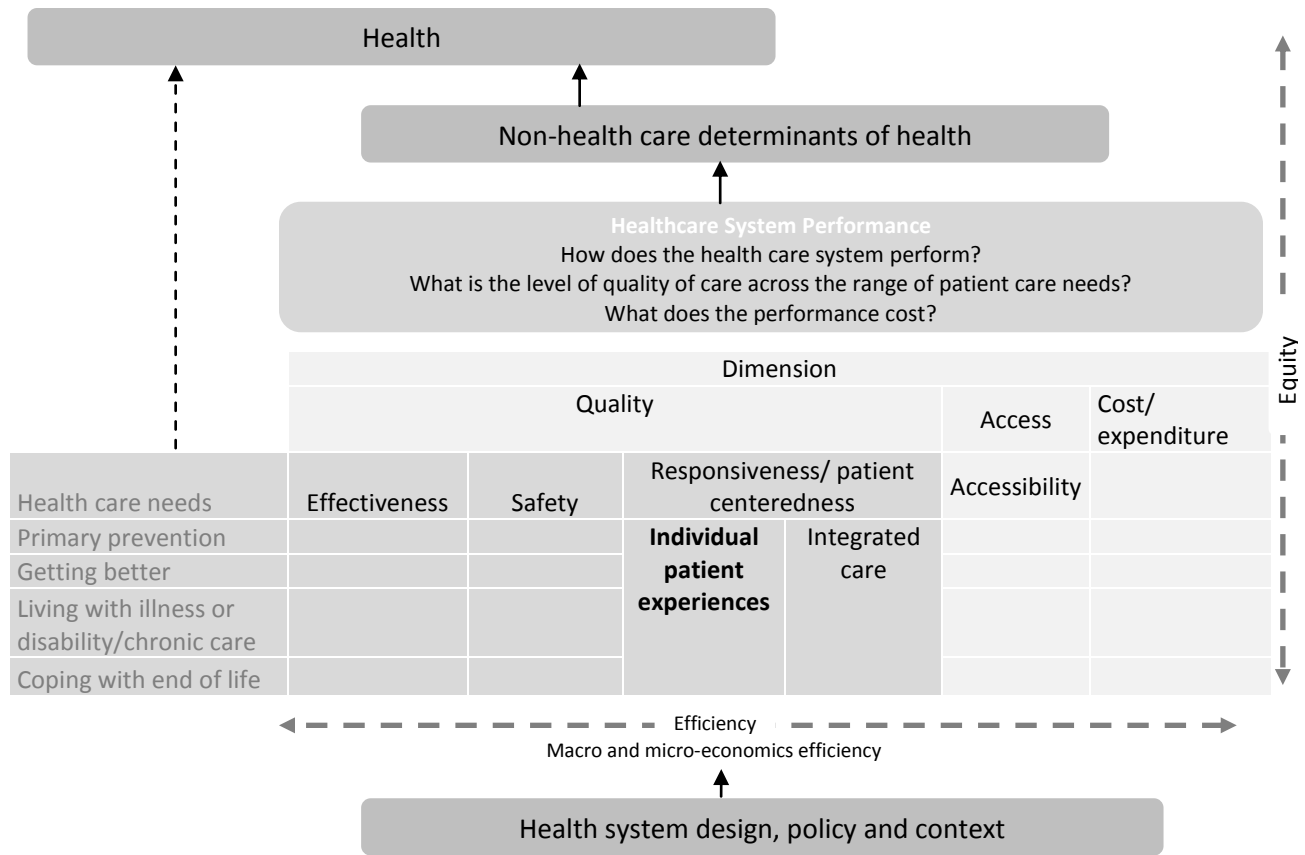
How patients experience care has been acknowledged as essential in several contexts and is used as a health care quality metric, routinely measured in some health care systems (Cleary, 2016). In the Organization for Economic Co-Operation and Developments community, comprised of thirty five countries, nineteen of them include outpatient experience as a comparable indicator of quality of care, as shown in the report “Health at Glance 2015” (OECD, 2015). In that work is acknowledged that the first nationwide efforts came from the U.S. and England. In the U.S. the Consumer Assessment of Healthcare Providers and Systems (CAHPS) from the Centers for Medicare and Medicaid Services (CMS) measures it

since 1997 both in hospitals and ambulatory care, making public reports of its results, with some influence in the payment scheme (Tefera, Lehrman& Conway, 2016). England, through the collaboration of the Picker Institute and the National Health Service, has been measuring since 2002 and between 2008 and 2011, financial incentives were in place for the primary care, based on user's experience as outcome (Padişon, et al 2012). However, this may not be a wide spread practice. A large international survey for primary care and general practitioners in eleven developed countries (Schoen et al 2009) found that in five of them, less than 5% of the physicians surveyed had economic incentives related to the proportion of patients declaring to be highly satisfied with their care. The highest proportion of physicians with those incentives was found in England, with a 49%.

The relation between the individual patient experience with the quality of the health care provision is included in the framework for health care system performance measurement from the OECD (Carinci et al, 2015), as seen in Figure 2.

Although in the literature there are many cases that patients experience and satisfaction is used interchangeably (i.e. Garrat, et al 2007; Wong et al, 2015) and a lack of consensus in its definition is still a pitfall in this area (York Health Economics Consortium, 2015), patient's satisfaction and patient's experience cannot be considered as the same. According to the Consumer Assessment of Healthcare Providers and Systems (CAHPS), the main difference lies in "While 'patient satisfaction' surveys obtain ratings of satisfaction with care, patient experience surveys elicit reports from patients on what they did or did not experience in their interactions with providers and the health care system" (Browne et al, 2010). The patient experience has been also related to another conceptualization that has gained importance, the responsiveness.

**Figure 2 “Revised OECD framework for performance measurement” adapted from Carinci et al, 2015 “Towards actionable international comparisons of health system performance: expert revision of the OECD framework and quality indicators”**



**Responsiveness**

The World Health Organization (2000) included the responsiveness as one of the main aims for every nation’s health care systems, alongside health outcomes and fairness of financial contributions. Building from the efforts and conceptualizations of CAHPS and the NHS, the WHO refined and expanded the concept of patient experience “to cover not only the interpersonal process between practitioner and patient or client, but also the interaction between the health system and the population it serves. This concept was called responsiveness” (op cit) also defined as “the way in which individuals are treated and the environment in which they are treated, encompassing the notion of an individual’s experience of contact with the health system” (Valentine, et al 2003) including “the system’s ability to respond to the

legitimate expectations of potential users about non-health enhancing aspects of care” (Robone et al, 2011). It was operationalized for its measurement in the next eight domains;

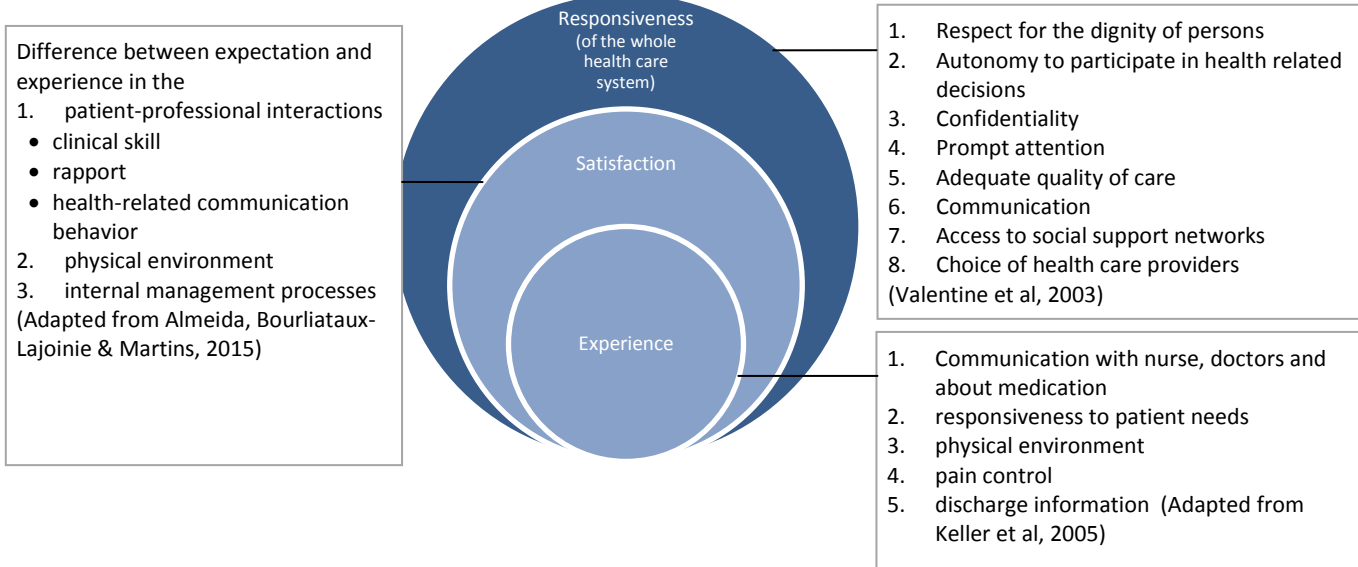
**Figure 3 Domains of Responsiveness**

Autonomy and Attention	<ul style="list-style-type: none"> <li>•The involvement in medical decision making and</li> <li>•timeliness of care and due attention</li> </ul>
Respect	<ul style="list-style-type: none"> <li>•dignity and treatment with regard</li> </ul>
Choice	<ul style="list-style-type: none"> <li>•of care provider and units</li> </ul>
Confidentiality	<ul style="list-style-type: none"> <li>•keeping medical secrets and maintaining privacy</li> </ul>
Communication	<ul style="list-style-type: none"> <li>•interactions with service providers</li> </ul>
Amenities of care	<ul style="list-style-type: none"> <li>•convenience of facilities</li> </ul>
Access to social support	<ul style="list-style-type: none"> <li>•family company, religious practices, etc</li> </ul>

During the literature review for this research, there seems to be the case that the most important international research and collaborative efforts in health systems are gravitating toward the experience part and system’s responsiveness rather than the satisfaction with the system itself. Also, following the research using the World Health Survey for 2003 (Bleich, Özaltın & Murray, 2009) there is some evidence that some hierarchy, from the most comprehensive concept to the most specific, can be outlined. Using 21 European Union countries’ data, the authors concluded that “people’s satisfaction with the health-care system depends more on external factors to the health system than on the experience of care as a patient”, and patients experience measured considering the eight responsiveness domains, only explains 10.4% of the variation on satisfaction as outcome.

As potential synthesis, the constructs models and its domains are summarized in the figure 3, from three examples already mentioned: the WHO model on responsiveness; CAHPS measurement on experience; and a systematic review on satisfaction measurements instruments (Almeida, Bourliataux-Lajoinie & Martins, 2015).

**Figure 4 Relation between Responsiveness, patients experience and satisfaction**



A core element for those three constructs is the communication and the patient-professional interaction. Being a main component of the patient experience and the patient-centered movement, communication & interpersonal skills are essential to provide clinically excellent primary care (Beach, 2006; Lee, Wright & Wolfe, 2016).

In this regard, in line with international literature and international health services advice already mentioned, Chile started a policy to improve this domain of quality in the public health care sector. The next sections will address in how this policy was implemented.

***The creation of a survey measuring patient’s experience and satisfaction on how they are treated in the Chilean public primary care***

The Chilean healthcare reform explicitly included public health care users’ satisfaction as one of its main concerns (Télliez, 2006), and in 2012 the nation’s parliament passed a law<sup>1</sup> in which it requires

<sup>1</sup> Law Number 20.824 “Improving the quality assurance system, on how are user treated in public healthcenters” (Perfecciona sistema de mejoramiento de la calidad del trato al usuario de los establecimientos de salud)

to implement yearly evaluations of patients experience and satisfaction on how they were treated, being expanded and corrected in 2015<sup>2</sup>. It explicitly requires the use of a survey that measures user's perception of the patient-professional interactions in the public health care system. Since then, every year almost all the urban primary care centers, and a representative sample of the smallest rural ones, are surveyed by a private third party<sup>3</sup> using the "TU-APS" tool built for this purpose (Arteaga, Fuentes & Vera, 2013) , with a national representative sample from both the public primary care and hospitals. Its creation is described next.

Requested by the health authorities, two new instruments that only measured specifically the relational aspects of the interaction with the health care personnel were created by the University of Chile Public Health School. The first was called "Received attention's quality evaluation in Hospitals" (TU-Hospital). Later, its version adapted for the primary care ("Evaluación de la calidad del Trato a Usuarios de Atención Primaria de Salud, TU-APS", in Arteaga, Fuentes & Vera, 2013) was built. It is explicitly stated that the main concept is the patient' evaluation of how they were treated, "construct that is more specific than quality of the attention and different to users satisfaction" (op cit). Although it's not acknowledged in the original work, the academic team agreed to use and adapt the aforementioned SERVQUAL framework and its five dimensions; empathy, tangibles (including only "personal appearance" from that dimension), courtesy and trust worthiness, availability, and perceived reliableness. This would generate a tool on how, both hospital and primary care users, perceived they were treated, being the core of it the human interaction, instead of technical abilities or knowledge from the health provider, making this measurement closer to the patient experience construct than patient satisfaction.

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<sup>2</sup> Law number 20.645 "The creation of a monetary allocation associated with the improvement of the quality on how users are treated, for officials governed by the municipal primary care statute " ("Crea asignación asociada al mejoramiento de la calidad de trato al usuario, para los funcionarios regidos por el estatuto de atención primaria de salud municipal" in spanish)

<sup>3</sup> until now only by public universities have won the contract

The research group generated the inpatient version, called “TU-Hospital” using experts opinion in the SERVQUAL dimensions and its questions. Later, a small pilot application for clarity and semantic appropriateness and a larger pilot use of the corrected version on 123 patients from four hospitals followed. With the data collected, an internal consistency analysis was performed, obtaining a Cronbach’ alpha of 0.884, deemed as evidence of good reliability, as well a main components exploratory factor analysis, with three latent dimensions explaining a total of 62% of the variance. Through that process, a 12 questions final version of TU-Hospital was created.

From that tool, a primary care version called “TU-APS”, was adapted. Following the same steps of TU-Hospital, two 2 items were removed. After piloting this tool, good psychometric properties were found, with a reliability as internal consistency (Cronbach’ alpha of 0.892), and evidence of validity using a main component exploratory factor analysis with a total of 71% the variance explained, also confirmed. Later, items were divided in questions that were targeted to the center in general, the administrative staff, the paramedics, and, finally, the professional staff. A translated version of the final questions included in the 2015 TU-APS survey is shown in the Appendix 1.

As stated earlier, in yearly process since 2014, almost all the urban and large rural primary care centers, and all the public hospitals, are surveyed by a private third party using the “TU-APS” tool. Later all national centers are ranked and divided in three tiers, and finally, financial incentives are distributed.

### *Patient’s satisfaction and the Family and Community Health care model*

Despite the claim that the family and community orientation of the primary care is a core domain of the model implemented in the public health care in Chile, how responsive it is to its populations needs is still in question. According to a national survey in 2015, although an 80% of the population agreed with the statement as living near a health care center in case of requiring it, almost in

the same proportion, an 82%, considered that in Chile the quality of healthcare depends on the capacity to pay, being mentioned the access to health care as the second most infringed human right in the country and the first as personally infringed in the last year for 24% of those surveyed (Instituto Nacional de Derechos Humanos, 2015). How accessible and patient-centered is the health care provision seems to be currently a large debt, especially considering that primary care is main entry point for most of the population, a 73% according to official data (FONASA, 2017).

In one qualitative research on the perception of Chilean primary care users on the basic elements of the Family and community healthcare model (Dois et al, 2016), two domains on the how they were treated emerged; reception, understood as an interaction that includes the basic pattern of a social behavior, like greetings, eye contact and kindness and; Healthcare, that includes a genuine interest for their problems, uses a clear language, an empathic and trust originating relationship, with time enough to explain their concerns and were their opinions are considered.

Still, no study has answered the question if centers that have implemented the family and community centered model have better patients experience and satisfaction on how they were treated, in this case, as reported in the national TU-APS survey. Although similar research was found (Gene-Bandía et al, 2007; Rodriguez, et al 2009; Rubinstein et al 2009; all in the 2010 systematic review of Van Herck and his team), no other research could be found that measured this relation with a national level sample, the one research that had large samples came from a developed country involving a city, and the research made in developing countries had a small sample size.

### **III. Aims**

**Research question;** is the family centered health care model in the Chilean public primary care, measured using the MAIS assessment, related to the patients' satisfaction on how they were treated by the health care center staff?

#### **Objectives**

To explore the relationship between the advancement of the family centered health care model in the Chilean public health care model and its user's satisfaction, using 2015 national data.

- To compare the SERVQUAL framework used by TU-APS survey to other frameworks related to users experience and satisfaction
- To include the family centered health care model framework as described and operationalized by the Chilean Health Ministry, incorporating the WHO framework for the Primary Care
- Find if there are differences in the type of centers in the advancement of the family centered health care model and user's satisfaction, the two main variables.

#### **Hypothesis**

It is hypothesized that a positive relationship exists between the advancement of the family centered care model, i.e the MAIS score, and the users' satisfaction in the TU-APS survey.

### **IV. Methods**

#### **Data collection**

In this observational and analytic study, a cross-sectional design will be used. As a secondary data analysis, no data collection was performed and most of the information is in the public domain.

Data on the MAIS score for each center are not in the public domain, but its access was granted by the Ministry of Health (Appendix 3)

## **Variables included**

### ***TU-APS***

The main outcome data is the 2015 results on the national survey using the TU-APS tool. The information was collected by the Pontificia Universidad Católica de Chile Survey and Longitudinal Studies Center (Centro de Encuestas y Estudios Longitudinales de la Pontificia Universidad Católica de Chile, 2015) and reported in a PDF format. The TU-APS tool consists in 28 questions. Every question grades the answer in a scale from one to seven, a familiar scale for the population to grade (the same scale in the educational system in the country). In this case, the results are each centers mean for all the 28 questions. Users were surveyed face to face in the health care center where they received attention, at the end of their visit, from staff of the University, acting as an external third party. The data was collected in the months of October and November of 2015 and the results were reported that same year, with information on the average score of the surveys collected for each center

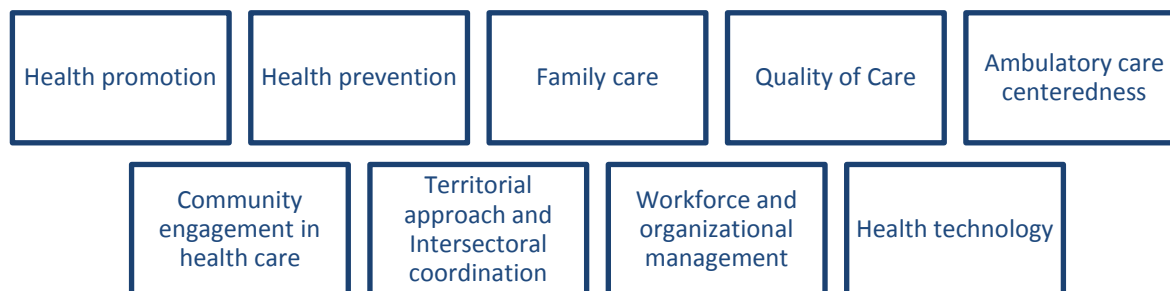
### ***MAIS***

The Family and Community' Comprehensive Health Care Model or MAIS, as defined by the Chilean Ministry of health is

“A model of how the members of the health care teams belonging to the health care system relate to the persons, their families and communities from a territory; putting the persons at the center of the decision making process; are acknowledged as members of a complex and diverse sociocultural system; its members are active agents of their healthcare, and the healthcare system and its functions are organized around their needs; oriented to seek the best possible state of well-being, through an integral, opportune, high-quality, and responsive health care, which is provided in all the healthcare network; being social and culturally accepted by all the population, due to its consideration to the person's preferences, social participation in all its undertaking –including other agencies and institutions- and the indigenous healthcare systems. In this model, health is a social value and the healthcare network is the articulated work of health providers, the organized community and other agencies and institutions”.(MINSAL, 2015)

The MAIS assessment tool was the effort to create a more concrete measurement, used by every public primary care center in the country, of the integral healthcare model development. This tool follows three key elements proposed by the PAHO (2009); person, family and community centeredness; integrated care and; continuity of care. The MAIS assessment is composed by 9 dimensions, as shown in Figure 5, and 75 items.

**Figure 5 Dimensions of the MAIS Assessment**



This evaluation seeks to measure what, according to the Ministry of Health definition, family and community centered care should be, and the higher the score, the highest adoption of the family and community based health care model is present in the center.

Most of the items are dichotomous, with a 0 or 1 evaluation, but some have partial grades (0,25, 0,5 or 0,75) if the condition is not fully completed. The score in all the items is summed and then divided by the maximum possible, transforming the score into a continuous scale, from 1 to 100.

The MAIS data was provided by the Chilean Health Ministry, authorized by its Primary Care Division (see Appendix 3) and collected using the MAIS website where all the information collected must be uploaded<sup>4</sup>. The MAIS measurement was performed first by each center, as self evaluation, and later by the local administrative organization, called Health Services, according to the local planning. It was

<sup>4</sup> <http://maisfamiliarcomunitario.cl>

performed throughout all 2015, and the total assessment from the researcher experience, takes about from five to six hours for each center.

### *Type of center*

Information on the type of center was used, following the classification used by the TU-APS survey, including urban centers, and rural centers from concentrated areas, as shown in Table 1. This last type also includes centers that provide inpatient care but are classified as a low complexity treating center, called Community Hospitals

**Table 1. Type of centers measured in the TU-APS survey, at primary care level**

<b>Name</b>	<b>Description of the Center type</b>
General Urban Center( <i>Centro General Urbano CGU</i> )	Primary care centers with up to 30.000 persons enrolled and covered by each center. Only ambulatory care is provided, treating low complexity diseases, with a high coverage of the population.
General rural centers ( <i>Centro General Rural CGR</i> )	Centers having between 2.000 and 5.000 people, for concentrated rural areas. They have fewer human resources than the CGU
Primary Care community hospital, or Type 4 Low complexity hospitals ( <i>Hospital Comunitario HC</i> )	Low complexity hospitals, with no more than 100 beds, placed in transition urban-to-rural localities above 10.000 and below 30.000 people. Although they provide inpatient care, the family and community health care model has being implemented and measured in those centers. Description of the type of centers Adapted from Sol foundation (2009) and Frenz (et al, 2014)

Small rural centers from disperse areas were excluded from the analysis for reasons that will be explained in the sample selection section.

### **Sample selection**

For the MAIS measurement, a total of 693 unique primary care centers, both rural and urban, had a complete evaluation in 2015 using the MAIS tool, made by local health authorities in charge to overview every health centers. 49 centers had partial evaluations and will be excluded. From the total, 28 were Community Family Health Centers (CECOSF, by its initial in Spanish), smaller centers that

depend directly from the larger General Urban Center type (see Table 2). Those centers are not included in the TU-APS survey, as they are considered as part of the larger center and usually the same staff is shared.

**Table 2. Centers with MAIS measurement in 2015**

<b>Type of center</b>	<b>N</b>
Community Family Health Centers CECOSF	28
General Rural Centers (CGR)	46
General Urban Center (CGU)	439
Primary Care community hospital, (HC)	19
Small Rural Center (Posta Rural)	161
Total sample	<b>693</b>

In the case of the TU-APS survey, each center’s average for all the questions included in the TU-APS tool is reported, and will be used in this work. A national probabilistic sample of 25.119 primary care users was collected in a total of 626 primary care centers, representing, after expansion, a total population of 16.486.733 Chileans and 1653 centers. It was decided that all large urban centers and rural from concentrated areas were included. According to the 2015 report, 75% of the centers were urban, collecting data from 95% of the existing 471 urban centers across the country in that year; 19% were large rural from concentrated areas, and 6% disperse small rural centers, with only a 5% of this last type of center being sampled, mainly for access and cost reasons. Most of the small rural centers were not sampled and almost all of their results were extrapolated from the mean of the municipality to where they belong. This decision was made by the Health Ministry to have data for all the primary care centers, as required by law, but for this research has the potential for being an important source of error in the analysis. Being a small fraction from the total number of small rural centers, only a 5%, and representing only a 2.6% of the universe of the public health care system users, these centers will be excluded from the analysis, reducing the number of centers included for this analysis from 626 to 564.

For the Community or Low Complexity Hospitals, data for 74 centers was collected and included in the report. For this type of centers no sampling error was reported. For large urban centers, in a total of five percent of those centers (23 centers), their results were imputed by the Health Ministry using the Municipality average. The composition of the sample for the TU-APS survey is shown next (Table 3)

**Table 3. TU-APS Sample description**

Type of center		Number of centers sampled	Sample size (users surveyed)	% of centers surveyed of the total national number	Sampling error
Urban CGU, by Administration	Municipality Health Service	423	18.029	95%	1,5%-63,3%
General Rural Centers (CGR)		25	1.187	100%	16,2%-37,8%
Community Hospitals		116	4.432	100%	2,6%-35,0%
Rural disperse (PSR)		74	1.565	74%	Not reported
		62	1.471	5%	0,0%-37,6%
	Total sample	<b>700</b>			

Finally, the cases that had both the MAIS evaluation and the TU-APS survey in 2015 compose the final sample included for this study a total of 503 individual centers (Table 5),.

**Table 4. Final Sample composition**

Type of center	Number of centers included	
Urban, by Administration	Municipality	414
	Health Service	24
Rural concentrated (CGR)		46
Community Hospitals (HC)		19
	Total sample	<b>503</b>

## Data Analysis

### *Exploratory and Bivariate Analysis*

Descriptive analysis was performed for both the MAIS measurement and the TU-APS survey, including central tendency (mean, median, skewness, asymmetry) and the normality of the distribution with a Shapiro-Wilk test. Also outliers will be searched and examined using graphical techniques, as Histograms and Boxplots, this last using Tukey's (1977) Inter Quartile Range (IQR) criteria; If a case is beyond 1.5 times the IQR is considered outlier, and the case must be checked. If a suspicious case is

presumably due to an error in the measurement, it was excluded. A case with a value higher to 3 times the IQR is a good candidate to be excluded.

Finally a bivariate analysis between the patients satisfaction survey and the MAIS score was conducted using a Pearson or Spearman's correlation, depending on the normality distribution assumption is achieved or not. The R software, an open source free to use statistics program, was used (The R core TEAM, 2014)

## Ethics

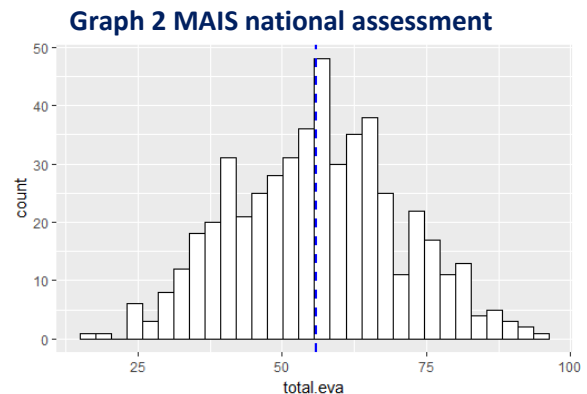
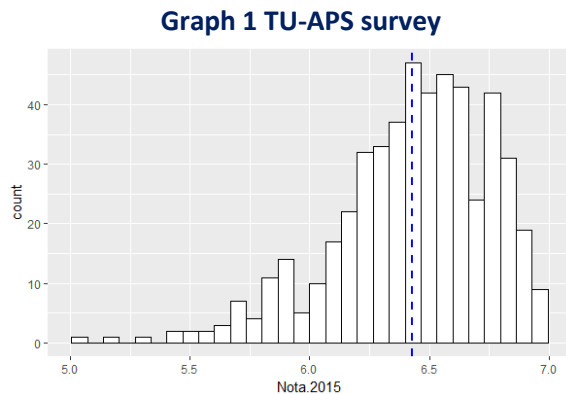
This is a secondary data analysis, were no identifiable private data from individuals or patients is included and it does not involve human subjects. The analysis unit is at health care center. No new information is collected and, as it was described for each variable earlier, most of the information is available in public databases or documents. In the case the score in the MAIS assessment, is related to information that is provided to each center. These factors make the current research considered as not needing the Institutional Review Board (IRB) approval.

## V. Results

### Descriptive Analysis

When analyzing the different included variables, the TU-APS strikes as one with a mean very close to the highest possible value. Whereas the evaluation ranges from 1 to 7, the national mean was 6.428 (sd 0.324, Table 6), and the minimum for was 5.07, with a high skewness to the right, meaning that most of the distribution is found above the mean, which is already high. This could be interpreted as; on average the users of the primary care in Chile evaluate very positively how they are treated in their encounters with the staff. Instead of the using the confidence Intervals around the mean, a pseudo median trough the Wilcoxon-test was obtained, a 6.453 (95% Confidence interval of the median 6.424- 6.481)

The MAIS score was closer to what is the middle of the possible score range, from 1 to 100, with a national median of 55.57 (95% CI 54.2-57.0), with a skewness close to zero and a normal distribution (W=0.9957, p-value=0.1829).



A summary of the main descriptive measurement for each variable is shown at the table 5.

**Table 5. Summary of the Variables included for this work**

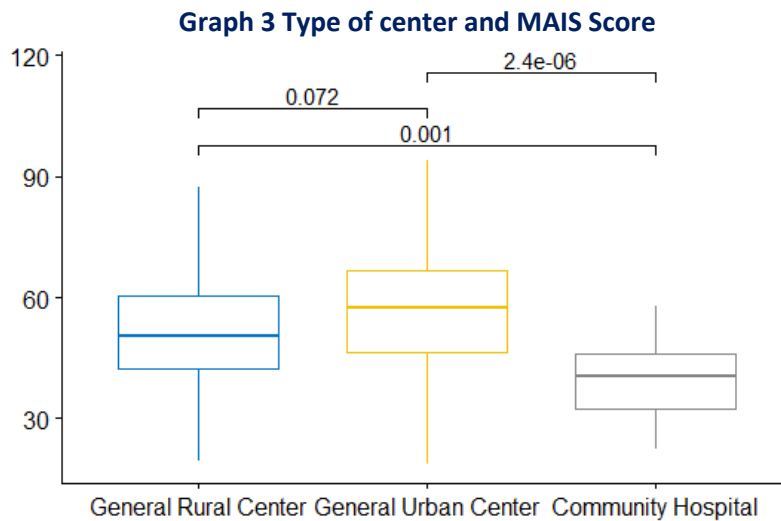
	Minimum	Median	Mean	Max	Standard Deviation	Skewness	Shapiro-Wilk normality test
TU-APS Survey	5.07	6.467	6.428	6.993	0.324	-0.872	W=0.9539, p-value=1.851e-11
MAIS score	16.67	56.40	55.98	95.33	14.54	0.013	<b>W=0.9957,</b> <b>p-value=0.1829</b>

*Analysis by type of center*

**Table 6 Mean scores for the TU-APS survey and the MAIS evaluation**

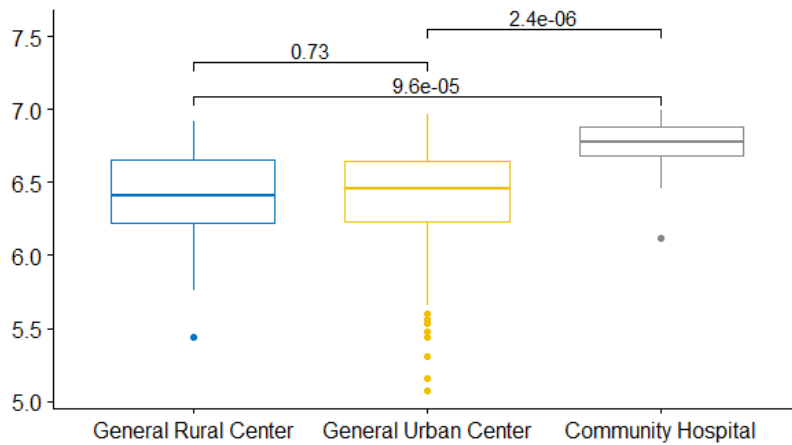
	TU-APS		MAIS	
	Mean	Sd	Mean	Sd
Community Hospital	6.74	0.21	39.65	10.74
General Rural Center GRC	6.40	0.34	53.18	14.63
General Urban Center GUC	6.42	0.32	56.55	14.85

When involved the type of center, similarities between the General Rural Center (GRC) and General Urban Centers (GUC) appeared, both for the MAIS score, but even more for the TU-APS survey. When analyzed the three types of centers and the MAIS score, the differences between them were statistically significant using the Kruskal-Wallis test ( $\text{Chi}^2=22.315$ ,  $p\text{-value}= 1.427\text{e-}05$ ), but mainly because of the lower mean score of the Community hospitals. The differences between the GUC and GRC were not statistically significant ( $P=0.072$ ), as shown in Graph 3



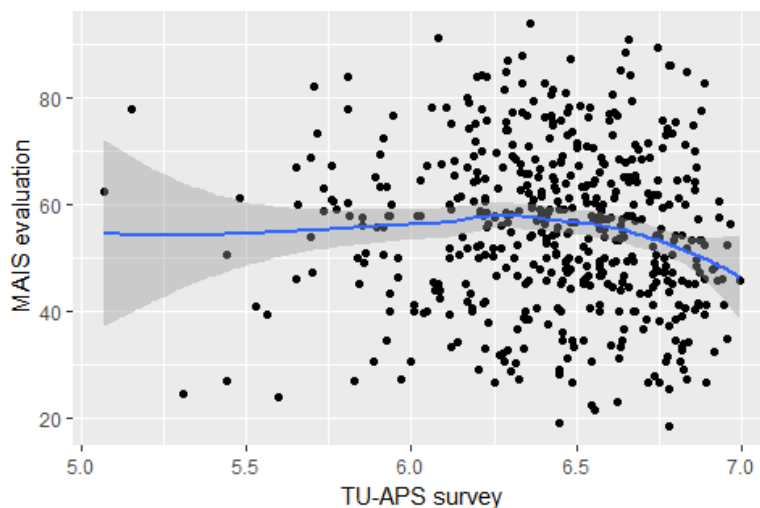
Analyzing the TU-APS score by type of center, the same trend is evident. A global Kruskal-Wallis test ( $\text{Chi}^2=24.747$ ,  $p\text{-value}= 4.229\text{e-}06$ ) confirms that there are differences between the three groups, but individual Wilcoxon Test between each group, as shown in Graph 4, confirms that there are no differences statistical differences ( $p=0.73$ ) between the GRC and the GUC, and the Community Hospitals are different with the other two.

**Graph 4 Type of center and TU-APS survey**

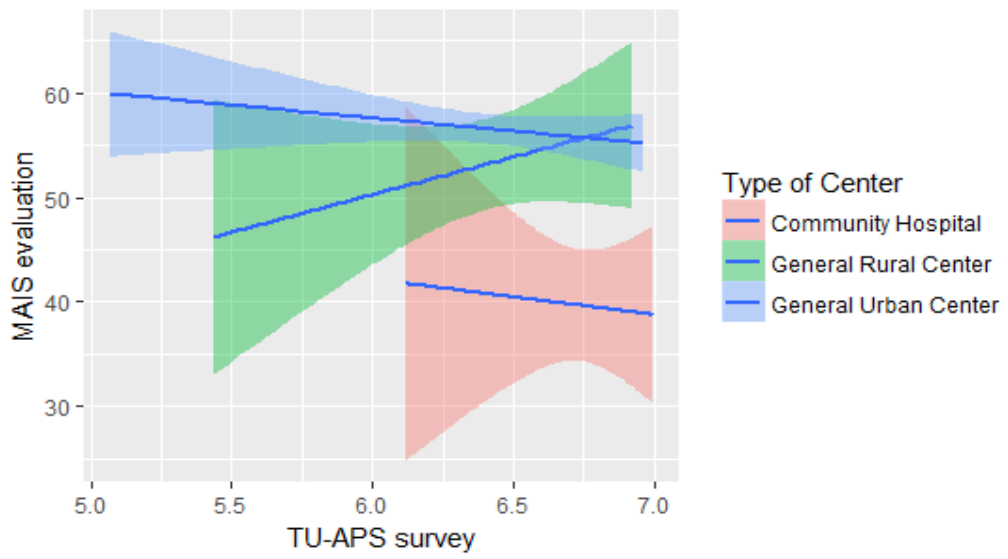


When evaluating the statistical association between the MAIS evaluation and the TU-APs survey, it's evident that a non-linearity relationship exists, as shown in the scatterplot (Graph 5). When tested with the Spearman coefficient, a small inverse relation was found ( $r = -0.1119$ ,  $p = 0.0117$ ), e.g. the highest the MAIS evaluation, the lower the results in the TU-APS survey. In order to test the nature of the relationship between the MAIS evaluation, the TU-APS survey and the type of center, again a graphical diagnose was used, in the form of a Scatterplot (Graph 6). An interaction between the three variables seems to be in place, with differences in the slopes change for the GRC and the GUC.

**Graph 5. Scatterplot, with lowess line.**  
**Linearity of the relation between the MAIS evaluation and TU-APS**



**Graph 6. Scatterplot, with lowess line.**  
**Relationship between the MAIS evaluation, TU-APS and type of center**



## VI. Discussion

The purpose of this research was to establish if there is a relationship between the MAIS model advancement in the primary healthcare system in Chile and the patient's satisfaction and experience with the attention received. This relation between the family and community oriented health care is, in theory (McWhinney & Freeman, 2009), and in practice (Stewart, 2000, Little et al,2001), one of the expected outcomes from implementing this healthcare approach. A patient centered healthcare system and an integral view of the user's needs should be related to the perception on how they are treated, specially focusing in the professional-user interaction, as the TU-APS survey does. However, this relationship was not conclusive, nor confirmed in the current study. While the correlation was weak to nonexistent for most of the cases, a not expected inverse relation with the MAIS evaluation was present for those centers where the 6.25 grade in the TU-APS threshold was crossed. i.e. the higher the score in the MAIS evaluation, the lower the TU-APS score. When type of center is included in the data crossing, the General Urban Centers show an inverse relationship in the both measurements, whereas the General Rural Centers had the opposite relationship, as shown in the Graph 6. This could be caused by different factors. It could be hypothesized that the GRC from less populated areas, had a lower staff-patient ratio, less burdened centers, and smaller communities that could impact how the staff relates to the community they treat and reciprocally, how the community perceives the staff. The setting, whether urban or rural, and its impact on the perception of the accessibility relationship between patient and healthcare professional has being studied in other research, with different results (Gené-Badia et al 2008).

According to the analysis performed with the Chilean data and the literature on patient's satisfaction reviewed for this research, it seems to be the case that the TU-APS survey is influenced in the same way as other are, meaning that a bias in the measurement could be in place. In average, the TU-APS survey presented both a very high mean and asymmetry of the distribution, leaning toward the

highest end of the scores in a 1 to 7 range scale. This could be the halo effect, due to gratitude for the received care, as stated by the York Health Economics Consortium (2015) research group. If this is the case, the measurement to relate or extrapolate to other measurements is compromised. Perhaps, the measurement of concepts like patients experience or the WHO system responsiveness framework should be considered as a shift for the current policy.

This gratitude bias could be reinforced when considered that “the structural segmentation of Chile’s health-care system has resulted in low-income, high-risk populations being served mainly by the public sector, while high-income, low-risk populations are generally treated in the private sector” as reported in the working paper for the 2010 World Health Report (Missoni & Solimano, 2010, p5). How Chile’s healthcare is structured, results in an underfunded and overwhelmed public sector (Aguilera et al, 2014), in a country that already has one of the lowest density of medics and nurses in the Organization for Economic Co-operation and Development (OECD, 2016).

The very high levels of satisfaction reported, as mean for each center in the TU-APS survey, are incongruent with other surveys when the healthcare access and quality is assessed. According to the 2014 Survey from the Chilean Superintendency of Health, the agency that overviews and regulates healthcare, “satisfaction with the health system has been decreasing and in 2014 reached its lowest point since 2007” (Bossert & Leisewitz, 2016). As mentioned earlier, access to health care, a key role of every primary healthcare service, is perceived as currently the second domain where rights are violated for the Chileans (Instituto Nacional de Derechos Humanos, 2015). This mismatch between perception when treated in primary care, according to the TU-APS survey, and other indicators of satisfaction with healthcare, needs further exploring. This could be partially explained as, for most of the population, access to health care is still mainly understood as care in hospitals. As recently stated by Solimano and Valdivia (2017) about the shift in health care in Chile as;

“[...] not being able to reduce the historically heavy dependence on tertiary care institutions. Overcrowded public hospitals remain a permanent feature of the healthcare system, which hampers the quality of care provided. Although Chile has an extensive Primary Health Care network, is limited resolutive [i.e. operative and solving problems] capacity does not motivate patient to stop going directly to hospitals to resolve their medical needs, however minor, and only exacerbates their dependence on tertiary care”

The MAIS model plays a key role in this matter. This shift toward a strong primary care, where the three principles of a patient-centered, integral and continuous care, seems in need of an even stronger implementation and follow up. So far, this is the first work that has tried to link the only assessment of the advancement of the Family and Community model in the primary healthcare in Chile with what is one of the expected outcomes. While the MAIS assessment is part of the nation’s effort to transform the primary health care into a more operative and human care system, the larger health impact has not being explored, not its achievements for the whole public primary care in Chile. Future research with evidence on the concurrent type of validity (e.g. other health indicators like lower rates of high blood pressure, other chronic conditions or lower child and maternal deaths in centers with better implementation of the Family and Community health care model as measured using the MAIS tool) is still to be reviewed in the Chilean context. More research on this initiative alone is notably missing, including the MAIS measurement itself and evidence of its validity.

### **Limitations**

The current study has several limitations. As the design of the current study is naturalistic, meaning, intact groups were considered, no variable manipulation was in place, the data was collected by the Health Ministry for other purposes than research, and the internal validity of the relations that can be found is threatened. However, the nature of information and how it was collected probably helps to the external validity of the findings, as all the data was collected from the centers and the only exclusion of cases were due to not having information for both measurements.

As no individual data was accessible, several confounding variables that have been shown to influence the patient experience (Fan et al, 2005, Paddison et al 2012) are not included, like age, gender, general health status, and being from an ethnic minority. This could have an impact biasing the results toward the null hypothesis, diminishing thus the apparent relation between the main outcome, the score in the patient experience survey, and the MAIS measurement. Internal organizational factors at center level, like experience of the staff, or resistance to implement the family and community health care model could be also playing a role and are not accounted for.

Also the role of the community empowerment could have a role, as a more demanding community, with a good awareness about the right to a healthcare with a humane treatment and relation, could impact in lower survey grades, whereas a more grateful and less cohesive community could accept as natural any type of communication and treatment from the health care center.

Limitations of the measurements are also present. The MAIS assessment was developed for the evaluation of health care centers with a clear goal; to promote and to deepen the adoption of a health care model that followed the family and community-centered principles. Although different actors were involved in its creation, including experts from primary care, scholars from several universities, and actors from the health ministry, no studies about its psychometric properties have been published yet, so indicators about its reliability are currently weak and only evidence on its face validity is available. Also, the only instruction to apply the lengthy assessment is the evaluation and its questions. For the 75 questions, it could mean that different criteria could be considered when using the MAIS assessment for each primary care center. These differences, that could hamper the reliability of the tool, were reduced by using the evaluation made by the Health Services, the administrative entity between the Health Ministry (MINSAL) and the primary care centers. This still means that 28 Health Services made a total of 693 evaluations using the MAIS assessment in 2015, and while it reduces the variation of the evaluation, still could be affected by clustering effects, based on the nuances in the criteria used.

For the TU-APS survey, the information is collected yearly by specialized third parties, with a standard procedure, and evidence for its reliability and validity was developed when constructed, following the standard and scholar requirements for measurement. These factors translate into probably fewer limitations on the measurement and more confidence in how the information is collected and can be used. However, in the last 5 years of measurement across the country no new research has been published or made public.

Finally, the final sample used for the analysis excluded some type of center that were included in one measurement but not in the other; the smallest most disperse rural centers (Postas de Salud Rural) were excluded because the impossibility to be identified from the TU-APS survey and matched with the MAIS assessment; the Community Family Health Centers (CECOSF), 28 in total, weren't included in the TU-APS survey. This could potentially have played a role in the findings. The smaller centers, the Community Hospitals and General Rural Centers, present a higher average.

Future research that includes factors at the center, municipality and Health Service level are interrelated should be included, as the literature shows its influence for the primary health care and its outcome. These factors include, among dozen others, number of population geographically assigned and coverage of services , provided to the population by the healthcare center, percentage of them over 65 years old, in poverty and/or with chronic conditions, all of them related to the demand and patient's profile; whereas number of staff, nurse, and medics, and/or expenditure in health, are related to the resources of the centers. All of them are variables known at center or municipality level for the whole country, and have data in the public domain.

## VII. Conclusions

No evidence was found about the relationship advancement of the Family and community integral healthcare and the user satisfaction on how they were treated. Despite the limitations already mentioned, some positive aspects can be concluded. One of the strength of the TU-APS survey, with a national scope and yearly collected data, it's the political willingness to evaluate a very important aspect of care. After research in the literature, it seems to be one of the first in the region and no other policy of this kind was found in other developing countries. As more data throughout the years is collected, better analytical designs that include all the years, like longitudinal designs, can be used, allowing for more insight on this topic. Finally, if a bias is systematically impacting the tool used, is easier to change or correct the tool by a measurement policy, rather than implement a new policy.

Despite these pitfalls, it seems to be the case that the MAIS assessment is unique and an innovation in its kind. No other evaluation where the Family and community orientation of the whole primary care of a country was found. This double ambition, to generate an instrument that assess the implementation of the MAIS model and, to implement it at national level, is the type of measures required by health leaders to promote primary health care based systems as the WHO (Van Lerberghe, 2008) and the international community (Walley et al, 2008) suggest.

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## IX. Appendix

### Appendix 1

#### **TU-APS (adapted from “Evaluación de la calidad del Trato a Usuarios de Atención Primaria de Salud, TU-APS”, in Arteaga, Fuentes & Vera, 2013)**

“In a scale from one to seven, were one is “awful” and seven is “excellent”, how would you grade?...”

##### In general

- 1) The way you were greeted by the staff when you arrived or when you were attended
- 2) The garments and appearance of the staff in this center, i.e their outfit
- 3) The ID the staff carries so you could easily identify them
- 4) The cleanliness of this center
- 5) How would you grade the waiting time since you arrived or when your appointment was scheduled, until you were attended

##### Administrative staff

- 6) The friendliness and courtesy of the staff who treated you
- 7) How fast were you attended
- 8) How interested was the staff of your understanding of the information provided
- 9) Staff disposition to listen and understand what you said
- 10) How secure and trustworthiness seem the staff of this center to you
- 11) Considering all the named factors, how were you treated by the administrative staff

##### Paramedics

- 12) The friendliness and courtesy of the staff who treated you
- 13) The time that the staff used to take care of you
- 14) The answers to your questions provided by the paramedics
- 15) How interested was the staff of your understanding of the information provided
- 16) Staff disposition to listen and understand what you said
- 17) How secure and trustworthiness seem the paramedics of this center to you
- 18) Considering all the named factors and in general terms, how would you grade how were you treated by the paramedics?

##### Professional Staff

- 19) The interest and courtesy of the professional who treated you
- 20) The explanation provided by the health professional about your health problem and treatment
- 21) The possibility to have an opinion about your health problem and treatment
- 22) The disposition of the professional to listen and understand what you said
- 23) How trustworthy seemed the professional to you
- 24) Considering all the named factors and in general terms, how would you grade how were you treated by the professional in this center?

## Appendix 2. MAIS Assessment dimensions and definitions

Dimension	Definition, as shown in the Assessment.	N° of Items and Sample question
Health promotion	Health promotion materializes through the efficiency in reducing the burden of disease and mitigates the social and economic impact of the disease, with an ample consensus in the existing relation of it and the human and economic development [...] Three main axis can be distinguished: Creation of local public policies, with territorial relevance [...] Intervention in the different components of the public health, based in the national, regional and communal epidemiological diagnosis [...] Participatory public management, through the entailment in the design and implementation of such strategies, with training of social leaders in the exercise of citizenship in public health and the implementation of citizen participation mechanisms [...]	14 items. Sample question. The center has material for health education about pregnant mothers' care, like pamphlets, providing them at their checkups
Health prevention	All the actions, procedures and interventions oriented toward disease risk factors identification, facilitating an opportune and pertinent answer, avoiding or minimizing risk	15 items. Proportion of youth covered and assigned to the center that had a preventive checkup at their schools or the center in the last year
Family care	Family constitutes the primary social context in which a healthy lifestyle can be promoted and disease can be treated. It influences individuals through repetitive behaviors patterns, models how to react to stressful situations and determines the adaptability of its members. Health care staff must define the intervention according to the family's risk and protective factors.	7 items. Proportion of the families covered and assigned to the center that had an evaluation of the psychosocial risk factors present in their members
Quality of Care	Citing Donabedian (1988) healthcare Quality is "That kind of care which is expected to maximize an inclusive measure of patient welfare, after one has taken account of the balance of expected gains and losses that attend the process of care in all its parts".	8 items. The center has a protocol and take special measures for those who show up more than seven times in the Emergency in a year, whether in the Hospital or primary care.
Ambulatory care centeredness	Its aim is to prevent hospitalization from the population enrolled to the center through any strategy, coordination, and network articulation possible, with special care for those more susceptible such as the elderly or those with chronic conditions.	7 items. A random sample of three clinical record from users that were discharged from a hospital after an brain or heart stroke in the last year, have a plan of care in the primary care, with aims and a person responsible for its execution

Dimension	Definition, as shown in the Assessment.	N° of Items and Sample question
Community engagement in health care	Considered a basic strategy for building a democratic system, based on citizenship and social capital, achieving welfare and social inclusion through empowerment and persons and communities' rights exercise, incorporating their opinions in health management.	10 items. The center has a professional responsible in charge of the community engagement, with at least 22 hours per week.
Territorial approach and Intersectoral coordination	Intersectoral coordination is the coordinated work from institutions that represent different social sectors and organizations, present in the territory (being public, private or civil society), through joint interventions aiming to transform health status and to support wellbeing and population quality of life, considering the social determinants of health.	5 items. The center has a yearly plan to develop and work with other institutions, related to their communities.
Workforce and organizational management	Primary care health administration entities from the Chilean municipalities must assure the development of the individuals composing the healthcare teams, propitiating an adequate work climate given its direct influence in the attention provided to the user	10 items. 90% of the staff has received training in the family and community health care model
Health technology	Any medical device, clinical and/or health management procedures that facilitates healthcare attention, and that could be used in health promotion, prevention, diagnosis, treatment, rehabilitation or care.	5 items. The Center has electronic health record for their patients.