

# Evaluation of Primary Health Care performance in Florianópolis, Santa Catarina, Brazil, 2012: a cross-sectional population-based study\*

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## Abstract

**Objective:** to evaluate the performance of Primary Health Care (PHC) in Florianópolis, SC, Brazil. **Methods:** this was a cross-sectional population-based study with adults living in the catchment areas of the Health Centers (HC) located in the Northern Health District of Florianópolis in 2012; the Primary Care Assessment Tool (PCATool-Brazil) was applied to assess the presence and extent of PHC characteristics. **Results:** of the 598 interviewees, 68,4% reported that they considered PHC centers to be their usual source of care; while the usage subdimension of the First Contact Access characteristic was the best evaluated (8.4; 95%CI 8.2;8.6), the service delivery subdimension of the First Contact Access/subdimension accessibility was the worst evaluated (3.5; 95%CI 3.3; 3.6); four (36.6%) of the eleven PHC centers evaluated had a high overall and essential PHC score, although their overall mean score was low (6.4; 95%CI 6.2;6.5). **Conclusion:** considering the PHC model evaluated by PCATool-Brazil, PHC services need to be improved, especially with regard to their process and structure components.

**Keywords:** Primary Health Care; Family Health Strategy; Health Evaluation; Cross-Sectional Studies.

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## Introduction

Evaluating the magnitude of the Family Health Strategy (FHS) is a task for which collective effort is essential, given the heterogeneity of its actions in the national context. Methodological rigor is necessary when administering Primary Health Care (PHC) assessment tools, producing scientific knowledge and searching for evidence of the effectiveness of the care model, with a view to its possible reorganization in the country.<sup>1</sup>

One of the ways to evaluate PHC is found in the Primary Care Assessment Tool (PCATool), created to analyze PHC performance according to the presence and extent of its essential characteristics (First Contact Access, Comprehensiveness, Continuity of Care and Coordination of Care) and derived characteristics (Family Centeredness and Community Orientation). This analysis tool provides questions about health care services to be answered by adult and child service users, health service managers or health professionals, according to the version of the tool adopted: for adult users or child users. Based on the Donabedian quality assessment model, aspects relating to health care service structure, process and results are measured.<sup>1</sup> The PCATool has been validated and used in different countries, such as Canada,<sup>2</sup> United States,<sup>3,4</sup> Spain,<sup>5</sup> China,<sup>6</sup> Argentina<sup>7</sup> and Brazil,<sup>8-10</sup> and has shown itself to be adequate in different health and cultural contexts.

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Even in Brazilian state capitals with successful PHC experiences, such as Belo Horizonte, MG, Curitiba, PR, Rio de Janeiro, RJ, and Florianópolis, SC, FHS has structure and process components that need to be improved. In Belo Horizonte, 147 managers of

primary health care units (PHU) and the nurse of each one of the 538 local FHS teams were interviewed. The characteristics best evaluated by them were First Contact Access/usage subdimension, Continuity of Care and Comprehensiveness; while the worst characteristics were First Contact Access/accessibility subdimension and Community Orientation, showing that the structure characteristics of the PHU and organization of the work process of the FHS teams influence in this performance.<sup>11</sup>

In Curitiba, the PCATool-Brazil was used with 190 FHS professionals (91 doctors and 99 nurses) in the municipality's PHU. First Contact Access/accessibility subdimension was the only evaluated characteristic that obtained a low score for PHC, while the remainder had high scores.<sup>12</sup> In Rio de Janeiro, 2,710 people were interviewed using the child version of the PCATool-Brazil, and 2,430 people using the adult version. On average FHS teams in the municipality of Rio de Janeiro had a lower overall PHC score and the characteristics with the worst performances were Comprehensiveness and First Contact Access/accessibility subdimension; while the best scores were obtained for First Contact Access/usage subdimension Coordination of Care/information system subdimension.<sup>15</sup>

The international literature shows that the applicability of the PCATool is varied. In Canada, Rowan et al. (2002) applied the PCATool with 134 Family and Community Medicine preceptors to assess whether they followed PHC principles. The highest result found was for the Coordination of Care characteristic, and the lowest for Cultural Competence.<sup>2</sup> Tsai et al. (2010) interviewed 879 people, both children and adults, to examine the relationship between having a usual source of care and the quality of outpatient medical care experiences in Taiwan, where there is universal health insurance coverage: the fact of having a usual source of care was shown to be significantly associated with First Contact Access/usage subdimension, Continuity of Care, Family Centeredness and Cultural Competence.<sup>6</sup> In the United States, Clancy et al. (2007) evaluated the perception of health care users with type 2 diabetes mellitus (DM2), with regard to group medical consultations (therapeutic group). 186 patients with uncontrolled DM2 were randomly assigned to receive individual or group care over 12 months. Compared to the patients who received individual care, patients receiving group care showed higher scores for Continuity of Care ( $p=0.001$ ), Community Orientation ( $p<0.0001$ ) and Cultural Competence ( $p=0.022$ ).<sup>4</sup>

Florianópolis has long been recognized for its PHC quality and coverage. Recognized as having the third best Brazilian Unified Health System (SUS) performance index (IDSUS) in 2012,<sup>14</sup> its PHC is centered on the Family Health Strategy,<sup>15</sup> however, as at the date of the publication of this article, there has been no assessment of its performance using the PCATool-Brazil.

The objective of this study was to evaluate PHC performance in Florianópolis, SC, based on the experience of adult users.

## Methods

This was a cross-sectional population-based study, carried out in the Northern Health District (NHD) of the municipality of Florianópolis in 2012, using the PCATool-Brazil as an instrument to measure PHC performance.

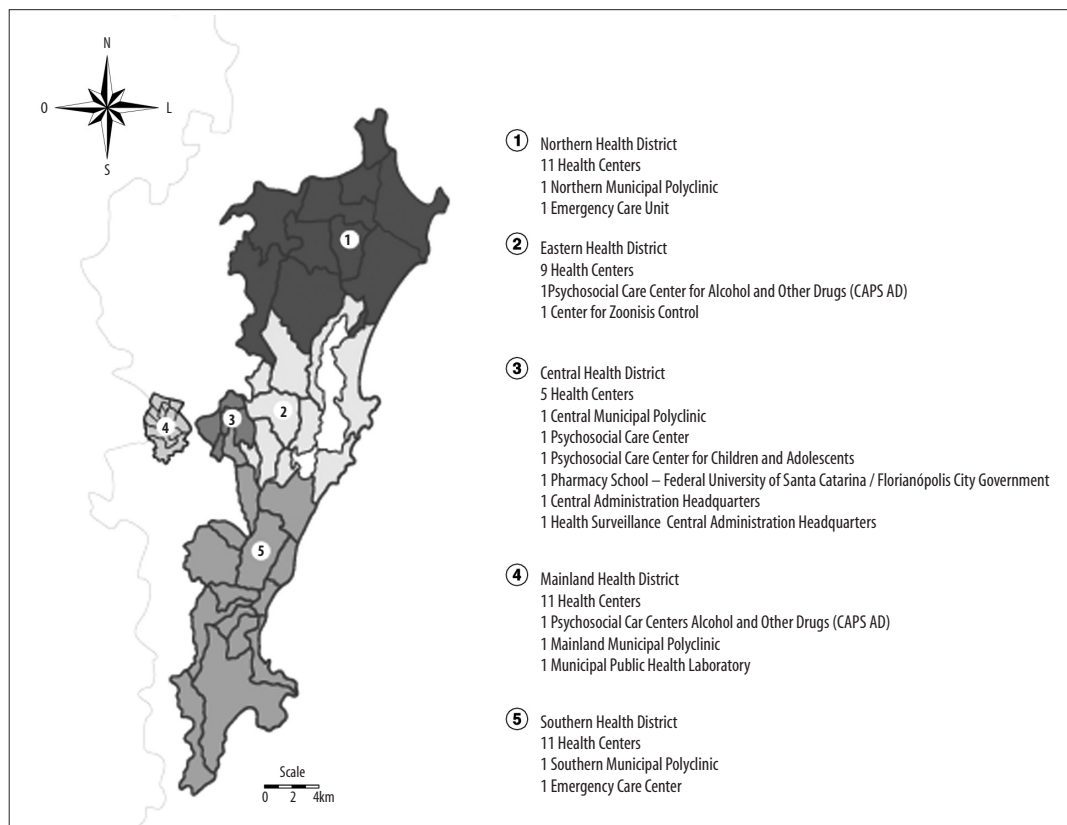
Florianópolis is the capital of Santa Catarina state. Located in the Southern region of Brazil, the municipality had 421,240 inhabitants in 2010.<sup>16</sup> Its municipal health care network is organized into five health districts (Figure 1) to meet the needs of its entire

population, of which 64,732 were adults covered by NHD during the period evaluated.<sup>17</sup>

Initially, PHC service users aged 18 or older living in households located in the catchment territory of 11 NHD Health Centers (HC) were included in the study.

OpenEpi® software was used to calculate the sample size. 459 questionnaires needed to be administered. The estimated sample size was increased by 30% to allow for losses and therefore 598 questionnaires were administered. The parameters used for this calculation were: (i) 95% confidence level, (ii) 5% absolute precision and (iii) design effect (Deff) of 1.2 to adjust for the cluster effect, estimating a proportion of 50% of users that would give a high score ( $\geq 6.6$ ). Interviewees who did not have one of the HC under analysis as their usual source of care ( $n = 189$ ) were excluded from the study.

The household sample was defined from clusters, stratified by Health Center and distributed proportionally to the size of their user populations. The selection of households for administration of the instrument was carried out by systematic sampling, by street and house. First the 11 Health Centers and the street names of their



**Figure 1 – Characterization of the five Health Districts, Florianópolis, Santa Catarina, 2012**

catchment areas were included on a Microsoft Office Excel 2010® spreadsheet in alphabetical order. A program function was then used to randomly relocate the order of the streets of the catchment areas of each HC and to determine in which street the interviews would start.

A coin was tossed in order to determine which side of the street the selection of the houses where people would be interviewed would begin: the first house to be visited was determined according to the which side of the coin was uppermost, moving to the second house on the opposite side of the street, followed by the third house on the same side as the first house, i.e. moving in a zigzag fashion until the end of the street was reached. Only after the interviews had been concluded in one street, did the interviewers move on to the next street following the order of the list, and so on, in an attempt to complete the number of interviews scheduled for each HC as described above, with the aim of minimizing the number of losses in relation to the estimated target.

The number of adults to be interviewed at each chosen household was limited to two. If there were more than two adults in the same household, the two eldest adults answered the questionnaire.

Community health agents (CHA) (n=83) were instructed and trained to carry out the interviews under the supervision of the FHS team nurses (n=24), FHS being the health care strategy used in Florianópolis.<sup>15</sup> Field data collection lasted for five months (May to September/2012).

In order to minimize measurement biases, CHA did not interview in the catchment area in which they usually worked and were allocated to another HC in the NHD. A pilot study was carried out for the purpose of staff training and to clarify doubts regarding questionnaire administration.

The population studied was characterized by sex, age, skin color/race and usual source of care - Health Center, Emergency Care Unit, Municipal Polyclinic or Supplementary Health Unit (private health service).

As mentioned earlier in this report, PCATool-Brazil measures the presence and extent of PHC characteristics. Answers to the questionnaire are rated according to a Likert type scale of numbers, ranging from 1 (it is certainly not) to 4 (it certainly is) and the additional option of number 9, meaning I don't know/don't remember. PCATool-Brazil has 87 items, divided into ten components related to the essential and derived PHC characteristics as listed below.

Firstly, the essential characteristics are:

- (I) Degree of Health Service Registration, identifies the usual source of care of adults interviewed;
- (II) First Contact Access/usage subdimension, checks whether the health service is the first service to be sought when a health problem occurs or if the service being evaluated is the only means of referral to specialized health services;
- (III) First Contact Access/accessibility subdimension, seeks to assess the capacity of the health service to provide timely care to its users when they have a health problem, in addition to the waiting time before the patient is seen by a doctor or nurse;
- (IV) Continuity of Care, verifies whether patients feel comfortable about expressing themselves in consultations, and whether the doctor or nurse have broad and comprehensive knowledge of the patient's biopsychosocial reality;
- (V) Coordination of Care/care integration subdimension, refers to the last consultation with a specialist or last specialized service accessed;
- (VI) Coordination of Care/information system subdimension, identifies whether the user is obliged to provide some sort of medical record or prior service record when they access the health service;
- (VII) Comprehensiveness/services available subdimension, verifies whether the interviewee knows what services are available at their health establishment, regardless of whether they have used these services; and
- (VIII) Comprehensiveness/service delivery subdimension, identifies whether given health issues were discussed with the interviewee at their last consultation (aging, for example).

Derived characteristics:

- (IX) Family Centeredness, evaluates whether the user participates in decisions about their treatment or treatment of their family, and whether issues related to their family dynamics are discussed during consultations; and
- (X) Community Orientation, examines how the health service recognizes the health problems of the community and encourages community participation to solve them.<sup>1</sup>

In accordance with the adult version of the PCATool-Brazil validation instrument, scores are standardized according to a scale ranging from 0 to 10, where scores equal to or greater than 6.6 are considered to be high - which corresponds to answers scoring 3 or

4 on the instrument's original scale. The 0-10 scale is standardized in the following manner:<sup>8</sup>

$$\text{Standard Score} = \frac{(\text{Score} - 1)}{(4 - 1)} \times 10$$

Microsoft Excel® 2010 was used for data input and statistical analysis. The descriptive analysis was performed by obtaining the absolute frequency, the percentage and the average.

The PHC performance score calculation was done in accordance with the Ministry of Health Manual for PCA-Tool-Brazil.<sup>1</sup> The PHC score was calculated for each of the characteristics, in addition to the essential score (ES: result of the average between the essential characteristics scores and the degree of registration scores), derived score (obtained by averaging the derived characteristics) and average overall score (AS: result of the average between all characteristics [essential and derived] and the degree of registration).

The participation of the respondents in the survey was voluntary and they signed a Free and Informed Consent Form, as recommended by National Health Council (CNS) Resolution No. 466 of 12 December 2012. The Florianópolis Health Research Projects Monitoring Committee and the Federal University of Santa Catarina Human Research Ethics Committee (Opinion No. 1.635.663) approved the study project on 12 June 2016.

## Results

We interviewed 598 users. Due to the methodology used there were no losses: the number of interviews planned for each health center was achieved. There was also no refusal on the part of participants. Individuals unable to be interviewed at the pre-determined time arranged a different day and time with the interviewer. The proportion of users who gave PHC high score for the services evaluated was 46.4% (n=190). The average age of the people interviewed was 47 years (SD=0.86), with a higher proportion of women (72.6%); 92% of people reported being of white skin color/race. The majority of respondents (68.4%; n=409) reported using the Health Centers as their usual source of care. These respondents formed the sample (n=409) for the subsequent analyses. Two other public services were mentioned as being the usual source of care in NHD: Emergency Care Unit (9.7%; n=57) and Polyclinic (2.2%; n=13); the remaining respondents reported that a Supplementary Health Unit (19.9%; n=119) was their usual source of care.

In general, the average overall PHC score was low (AS=6.4). Table 1 shows the mean scores of the characteristics and the mean essential, derived and overall scores for PHC, as well as the frequency of high scores ( $\geq 6.6$ ) as evaluated by the users of the NHD Health Centers in 2012. The highest PHC evaluation score corresponded to the First Contact Access/usage subdimension characteristic (8.4; 95%CI 8.2;8.6); The First Contact Access/subdimension accessibility was the worst (3.5; 95%CI 3.3; 3.6).

Figures 2 and 3 show, respectively, the essential and average overall PCATool-Brazil scores for all 11 NHD Health Centers. Four of the services evaluated (36.6%) were found to have a high PHC score, in terms of both the average essential score and the overall score.

## Discussion

We found heterogeneity in the assessment of the overall score for Primary Health Care and for each of its characteristics individually in relation to the health centers of the Northern Health District of Florianópolis, Santa Catarina.

The results are similar to those of a systematic review conducted by Prates et al. of 22 articles published in national and international literature between 2007 and 2015 which evaluated the performance of PHC services using the PCATool instrument from the perspective of the service user. According to their review, the best assessed characteristic was First Contact Access/usage subdimension (AS 3.5; 95%CI 3.3;3.6), while the worst were First Contact Access/accessibility subdimension, Comprehensiveness, Family Centeredness and Community Orientation.<sup>18</sup> In our study, the First Contact Access characteristic showed important variability: while the accessibility subdimension received the worst score, the usage subdimension had the best (AS 8.41; 95%CI 8.22;8.61) out of all the characteristics evaluated.<sup>18</sup> This variation is also found in other studies that used PCATool-Brazil. Araújo et al., in their assessment of PHC performance from the perspective of the elderly, interviewed 100 elderly patients cared for by ten FHS teams from 20 PHU in Macaíba, RN, and obtained similar results (usage: AS 8.5; 95%CI 8.1;9.0) (accessibility: AS 3.8; 95%CI 3.6;4.1).<sup>19</sup> Silva and Fracolli found the same variability when interviewing 527 adults aged over 18 years old registered with 33 FHS Health Units in Alfenas, MG (usage: AS 8.6; SD 2.0) (accessibility: AS 3.2; SD 1.5).<sup>20</sup>

**Table 1 – PCATool-Brazil<sup>a</sup> average characteristics, essential, derived and overall scores and high score frequency for Primary Health Care according to service user evaluation (n=409) of the Northern Health District Health Centers of Florianópolis, Santa Catarina, 2012**

Primary Health Care Characteristics	Mean scores (95%CI <sup>b</sup> )	Proportion of high scores (≥6,6) n (%)
First Contact Access - usage	8.4 (8.2;8.6)	360 (88.0)
First Contact Access – accessibility	3.5 (3.3;3.6)	14 (3.4)
Continuity of Care	6.4 (6.2;6.6)	211 (51.6)
Care coordination - integration of care	6.7 (6.5;7.0)	151 (36.9)
Care coordination - information systems	7.0 (6.8;7.2)	287 (70.2)
Comprehensiveness - available services	5.4 (5.2;5.7)	142 (34.7)
Comprehensiveness - service delivery	5.1 (4.9;5.3)	125 (30.6)
Essential Score	6.6 (6.4;6.7)	208 (50.9)
Family Centeredness	5.8 (5.5;6.1)	205 (50.1)
Community orientation	5,2 (4,9;5,5)	130 (31,8)
Derived score	5.5 (5.2;5.5)	168 (41.1)
Overall Score	6.4 (6.2;6.5)	190 (46.4)

a) PCATool: Primary Care Assessment Tool.

b) 95% CI: 95% confidence interval.

Note:

Scores assume values of 0 to 10.

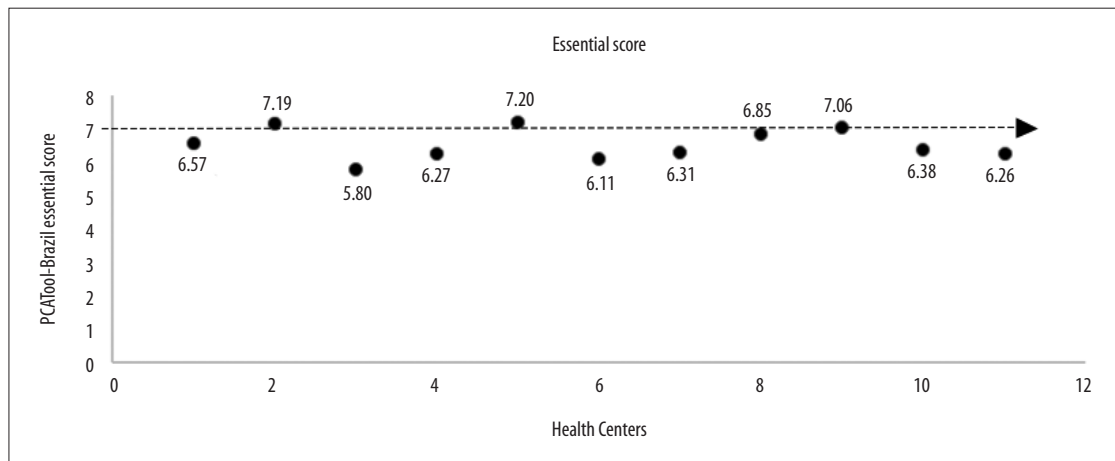
These results suggest that although people are using FHS, there are difficulties regarding the accessibility of these services. Access means not only the user's admission to health system or the availability of services and resources at a given time and in a given place, but also the match between the needs of the population and the delivery of these services.<sup>21</sup>

Among the findings of our study, PHC Continuity of Care obtained a lower average score, although it was near to the cut-off point of 6.6 (AS 6.4; 95%CI 6.2;6.6). This result is similar to that found by Chomatas et al. in Curitiba (AS 6.6; 95%CI 6.4;6.7).<sup>12</sup> This characteristic is a central and exclusive PHC feature. Greater extent of Continuity of Care tends to produce greater diagnostic and treatment accuracy, reducing the number of unnecessary referrals and the performance of procedures of greater complexity, and therefore lowering public health costs.<sup>22</sup>

The Coordination of Care characteristic achieved a high average PHC score, both for the integration of care (AS 6.75; 95%CI 6.5;7.0) and for information systems (AS 7.0; 95%CI 6.8;7.2). Furtado et al. reached the same conclusion in a study in which they administered PCA with 44 mothers of children under one year old who used FHS in Ribeirão Preto, SP: using the original scale of the instrument, which varies

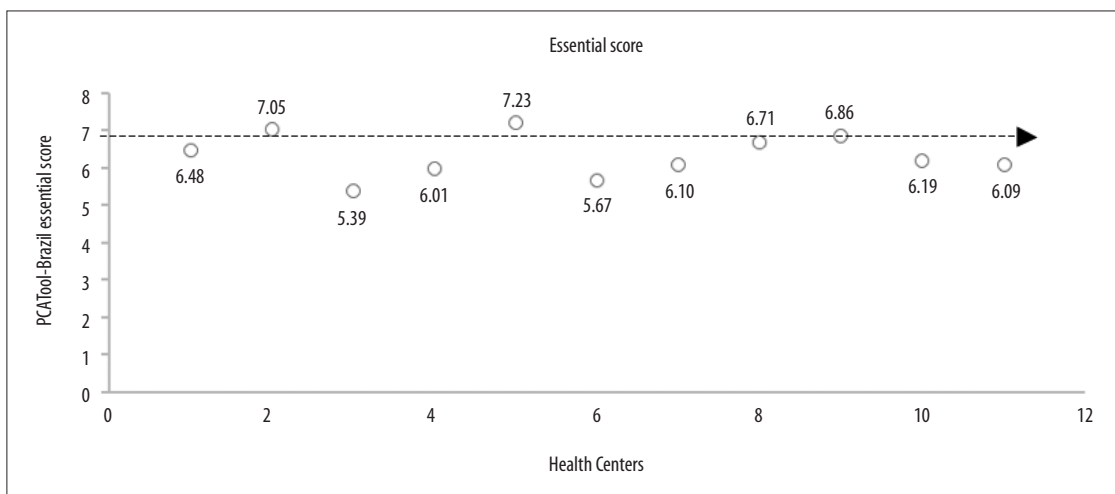
from 1 to 4, the scores they found above 3.0 represent strong presence and extent of the Coordination of Care characteristic, with regard to its integration of care (AS 3.7; SD 0.4) and information systems (AS 3.6; SD 0.3) subdimensions.<sup>23</sup> This shows the ability of the FHS teams in ensuring continuity of care within the health care network. The availability of information in the service network about service users, i.e., the existence of medical records with information on service users at all points of the network, is essential for health care coordination. The aging population and the consequent increase in the prevalence of chronic diseases make information system integration increasingly necessary.<sup>24</sup>

As to the Comprehensiveness of care, both services available (AS 5.4; 95%CI 5.2;5.7) and services delivered (AS 5.1; 95%CI 4.9;5.3) obtained a low score. Lima et al. reached a similar conclusion after interviewing 215 women between 20 and 49 years old who used FHS services in Serra, ES, (available services: AS 5.05; SD 1.6) (service delivery: AS 3.9; SD 2.16).<sup>25</sup> The low score for Comprehensiveness points to the difficulty the local health services evaluated have in arranging the health care team in such a way as to ensure all necessary services for its population, as well as taking responsibility for the delivery of these services at other points in the care network.<sup>24</sup>



a) PCATool: Primary Care Assessment Tool.  
 Note:  
 Scores assume values of 0 to 10.

**Figure 2 – Average PCATool-Brazil<sup>a</sup> Essential Score for Northern District Health Centers, Florianopolis, Santa Catarina, 2012**



a) PCATool: Primary Care Assessment Tool.  
 Note:  
 Scores assume values of 0 to 10.

**Figure 3 – Overall PCATool-Brazil<sup>a</sup> average scores for Northern Health District Health Centers, Florianopolis, Santa Catarina, 2012**

Family Centeredness (AS 5.8; 95%CI 5.5;6.1) and Community Orientation (AS 5.2; 95%CI 4.9;5.5) obtained a low overall PHC score, similarly to the results found by Marques et al.<sup>26</sup> when evaluating the PHC and maternal and child health based on interviews with 76 carers of children aged 0-5 years in a quilombola community in the state of Minas Gerais (Family Centeredness: AS 3.8; SD 2.6) (Community Orientation: AS 5.8; SD 1.9).<sup>26</sup> These results are evidence of the

difficulty health professionals have in two relevant aspects: (I) having greater knowledge about the way patients' families function and their dynamics, in order to resolve any conflicts and needs, and (ii) learning to recognize the needs of the population in their physical, economic and social development contexts.<sup>24</sup>

Among the limitations of this study, restricting interviews to up to two per household, owing to logistic and financial restrictions, may have increased

the average age of the sample studied and reduced its representativeness. Nevertheless, the distribution of the age frequencies of the sample studied is similar to that of the adult population who effectively used PHC services in Florianópolis in the year 2017. Although the community health agents/interviewers were allocated to health centers other than those where they routinely worked, in order to minimize possible effects of measurement bias, they introduced themselves to the people to be interviewed as municipal government health professionals. This fact may have intimidated the interviewees when assessing their usual source of care as unsatisfactory and consequently may have given better evaluation scores, even though they participated voluntarily and signed a Free and Informed Consent Form to take part in the study.

Another possible limitation of the study is that PCATool-Brazil applies the same weight to all characteristics used by the instrument, assuming that the service performance can be assessed solely by the presence and extent of these PHC characteristics.<sup>20</sup> Moreover, the use of PCATool-Brazil is limited to adults. Not using other versions of the instrument - for children, health professionals or health service managers - may lead to limitations in the generalization of the performance results of the services assessed, which might be avoided if all those involved in service delivery were interviewed.

The performance of the PHC services evaluated should be enhanced by strengthening the structure and process components to achieve the best performance. The First Contact Access/accessibility dimension was the worst rated characteristic, contributing substantially to the reduction of the average overall and essential

scores. Changes are therefore needed in order to improve accessibility to these services. Changes in the way consultation appointments are made are important and can contribute toward this.

Many FHS teams in Brazil have sought to improve their accessibility by deploying more agile models of appointment making, such as the so-called Advance Access, which allows for a greater balance between supply and demand for health services, reducing the waiting time for consultations - not without effort, with the necessary adaptations to the local reality.<sup>27</sup>

As a conclusion of this report, its authors believe that the establishment of horizontal cooperation strategies between health teams and health managers, institutional support for planning, conducting monitoring and assessment of the presence and extent of PHC characteristics periodically, and the rational use of their results, can contribute to the reformulation and development of the quality of Primary Health Care in Brazilian municipalities.

### Authors' contributions

Vidal TB contributed to the preparation of preliminary versions and final version of the manuscript. Vidal TB and Fontanive PVN contributed to the design of the study, data collection, data analysis and interpretation and critical review of content. Tesser CD and Harzheim E contributed to the design of the study, preparation of preliminary versions and critical review of content. All the authors have approved the final version and declared themselves to be responsible for all aspects of the study, ensuring its accuracy and integrity.

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