ORIGINAL ARTICLE

ANALYSIS OF THE LONGITUDINALITY ATTRIBUTE WITH THE IMPLEMENTATION OF THE ADVANCED ACCESS MODEL: MULTIPLE CASE STUDY

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Highlights:

(1) Longitudinality of care impacted by Advanced Acces Model. (2) Access and Longitudinality: Accessible Service or Continuing Care Service? (3) Few studies use the UPC method to measure longitudinality of care.

PRE-PROOF

(as accepted)

This is a preliminary and unedited version of a manuscript that has been accepted for publication in Revista Contexto & Saúde. As a service to our readers, we are providing this early version of the manuscript as accepted. The article will undergo further editing, formatting, and author approval prior to final publication.

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ANALYSIS OF THE LONGITUDINALITY ATTRIBUTE WITH THE IMPLEMENTATION OF THE ADVANCED ACCESS MODEL: MULTIPLE CASE STUDY

ABSTRACT

The aim was to evaluate the longitudinality of care in family health units before, during, and after the implementation of the Advanced Access model. The reference for this evaluation was the usual provider continuity index (UPC). This was a descriptive study with a mixed-methods approach, conducted at the Southern Regional Coordination of the city of São Paulo-SP. The research participants were the coordinators of 5 basic health units (BHU), doctors, nurses, and 295 users of these BHU. Data were collected using the Primary Care Assessment Tool (PCATool) and production records available at the BHU. The data were organized on the REDCap® platform. Statistical analysis was performed using R® software. The results demonstrate that 3 of the 5 BHUs had a higher provider continuity index (UPC) before the implementation of the Advanced Access model, indicating that in these BHUs the implementation of the Advanced Access model compromised the longitudinality of care. In contrast, in two BHUs, there was an improvement in the provider continuity index (UPC) after the model was implemented. It was concluded that the longitudinality of care attribute was due to planning and coverage problems in the BHUs in the southern region of the city of São Paulo. These problems cannot be attributed solely to the implementation of the Advanced Access model.

Keywords: Longitudinality; Continuity of Patient Care; Access to Health Services; Primary Health Care; Accessible Primary Care.

INTRODUCTION

Primary Health Care (PHC) is the first level of contact with health services[1]. The fundamental components of this area of assistance aim not only to expand access but, more importantly, to emphasize justice and social equity and strengthen care through a paradigm shift toward a focus on health rather than disease[2]. In Brazil, PHC has been supported since 2006 by the National Primary Care Policy (*Política Nacional de Atenção Básica*, PNAB), which plays a central role in organizing, coordinating, and ensuring accountability within the health system[3].

According to Borin et al.[1] PHC is based on four main attributes: first contact, longitudinality, comprehensiveness, and care coordination. First-contact assistance aims to

serve as the gateway to the country's health system, providing services with a lower technological density. The second attribute, longitudinality, indicates that when a user consistently seeks the same source of assistance and this source meets their needs regularly, it creates and maintains a bond with the service over time, so that when a new demand arises, it will be responded to more efficiently.

This attribute refers to the continuity of care over time, in which the health professional establishes a lasting relationship with the user[4], knowing them in depth and accompanying them in all phases of the care process, from prevention to the treatment of chronic diseases[5]. This type of approach promotes the effectiveness and efficiency of care, since the professional has a more comprehensive and integrated view of the user's health, being able to identify their needs early and act preventively[6]. Furthermore, longitudinality favors the construction of a bond of trust between the user and the professional, which contributes to greater adherence to treatment and an improvement in the quality of life of users[7].

In the same interim, comprehensiveness requires that PHC adequately recognize the full range of user health-related needs and make resources available to address them[8]. Care coordination is responsible for organizing, coordinating, and integrating care for the patient, regardless of the level of assistance they received[9]. The four attributes are interrelated. A relationship with a regular source of assistance implies that this is the first point of contact for assistance. This also implies that the regular source of assistance ensures that it is comprehensive and coordinated[4].

In Brazil, PHC is officially considered the preferred gateway to the healthcare system, with Family Health as a priority strategy for organizing services. Thus, it is expected that PHC services, with family health teams (FHTs), will be accessible and responsive to the health needs of the population[2]. Therefore, for the population to access health services, access is considered the first step for the user. In this sense, Basic Health Units (BHU), as well as Family Health Strategy (FHS) units, require mechanisms to be an effective point of first contact, in order that this can be the beginning of strengthening the other attributes to be guaranteed by the health team[4].

To this end, some countries have developed mechanisms to reorganize access in PHC. One such approach is Advanced Access (AA) or Open Access. This healthcare access model has the motto "Doing today's work today". This model was created by Murray and Tantau[10] in the US, who describe AA as a scheduling system that consists of scheduling patients for same-day care. Studies show that this model has contributed to a decrease in the number of missed medical consultations and an increase in the number of appointments for the population[11-14].

AA expands access to spontaneous demand while simultaneously organizing appointments for priority groups. It works to reduce the gap between supply and demand. The AA model protects future work capacity because today's work is done in the present[11].

A case-control study conducted in England[15] compared units with and without AA and showed that the waiting time for consultations with any physician decreased significantly with AA compared to control practices. The number of appointments offered also increased; however, no differences were observed in continuity of care or in the reduction of professional workload.

Based on its dimensions, longitudinality in relation to the organization of traditional scheduling intervenes to reduce scheduling in the long term and reduces waiting time for medical consultations. This system seeks to balance supply in relation to demand, adapting to practices in the APS, in addition to contingency plans for unusual circumstances that may occur in the daily routine of services[16].

It also represents an important guideline for strengthening the FHS in its purpose of transforming the health reality of the population, improving its potential to increasingly become the usual source of assistance and care within the scope of the Unified Health System (*Sistema Único de Saúde*, SUS)[17].

Longitudinality is the long-term personal relationship between health professionals and users, permeated by strong interpersonal ties that reflect mutual cooperation between people and health professionals[4]. From this perspective, ensuring longitudinal assistance requires good communication between the parties, trust, and a sense of responsibility throughout the relationship[5]. The word continuity often replaces longitudinality; however, continuity of care is conceptualized as "the monitoring by the same doctor or not of a specific problem of the

user". Continuity is not a characteristic element of Primary Care nor does it require a personal relationship between the professional and the user, since good records can meet the need for information for proper monitoring of the pathology[6].

In this context, achieving longitudinal assistance means that those individuals in the population identify a source of assistance as usual, that providers or groups of providers recognize, at least implicitly, the existence of a formal or informal contract to be the usual source of person-oriented (not disease-oriented) assistance; and that this relationship exists, for a defined or indefinite period of time, until explicitly changed[1-4].

Thus, it is assumed that, among the challenges of implementing the AA, the longitudinal nature of care represents an important guideline for strengthening the FHS because it is a model of assistance that prioritizes care. Therefore, to achieve this longitudinal assistance, it is necessary for the user to identify a source of assistance as usual, this usual source of assistance being person-oriented.

A study on the implementation of the AA model in a Basic Health Unit (BHU) in the interior of São Paulo showed that there was an increase in the number of medical appointments, which is an indirect measure of increased access for the population. However, it is questionable whether this increase comes at the expense of shorter appointments, which could affect the quality of assistance in health and longitudinality[18].

In this sense, this study proposed to evaluate the longitudinality of care before, during, and after the implementation of AA in the Southern Regional Coordination (*Coordenadoria Regional Sul*, CRSul) in São Paulo-SP, through the Usual Professional Continuity (UPC) method.

METHODOLOGY

To define the population of this study, the database of the research "*Regulação em saúde: fatores relacionados à resolutividade na Atenção Básica*" (Health Regulation: Factors Related to Resolution in Primary Care) was used. This project was approved by the Ethics and Research Committee of the Hospital Israelita Albert Einstein in a meeting held on March 12, 2019, CAAE 06807019.2.0000.0071, Opinion No. 3,212,241, and funded by CNPq ((Process 409134/2018-

0). The aim was to identify the factors involved in the resolution of health assistance, utilizing user satisfaction measured through the PCATool adult user dimension and the sociodemographic characteristics of the region.

From a secondary database collected by the aforementioned study, Basic Health Units (BHUs) that had coordinators participating in the institution's Strategic Planning Regulation Committee and that began implementing AA in June 2018 were selected for this study. Thus, five units were eligible, named: BHU A, BHU B, BHU C, BHU D, and BHU E.

Interviews were conducted using the PCATool with 5 Family Health teams and 295 users. The Primary Care Module (*Módulo de Atenção Básica*, MAB) system was also used (a system no longer in use, but was in use at the time of data collection). This system stores data on all actions carried out in Health Units and Family Health teams, similar to an electronic medical record. The data were allocated to the REDCap® platform - Research Electronic Data Capture and the Research Project Management System (RPMS), in anonymized form.

Based on the data collected in the research "Health regulation: factors related to resolution in Primary Care", the BHUs with health coordinators and that began implementing AA in June 2018 were selected for this study. Thus, the Units in this study were named BHU A, BHU B, BHU C, BHU D, and BHU E, using data from the PCATooL instrument, adult user version, to evaluate the first contact Access Attribute - Utilization and Accessibility, and the Longitudinal Care Attribute in Teams that implemented Advanced Access from the user's perspective. And data from the MAB system to calculate the UPC (Usual Provider Continuity), which is the indicator of continuity of care used in this study.

The UPC aims to evaluate the number of visits to a regular source of care, dividing this number by the total number of visits in the same period. The resulting ratio is known as the UPC[19]. The closer the ratio is to 1, the higher the longitudinality. This measure, when applied to all visits within a given period of time (usually a year), indicates the extent to which a habitual source of care is used over time[1].

The variables of interest for the study taken from the MAB system were:

1- Total number of times the patient sought care at the BHU;

2- Total number of times the patient was seen by their primary FHS (physician, nurse);
3- Total number of times the patient was seen by their sister FHS (physician, nurse);
4- Total number of times attended by professionals (doctor, nurse) from another team;
5- UPC FHS result.

The data were divided respectively: before AA implementation in the five BHU (start of the 2nd semester of 2017 to the 1st semester of 2018), during AA implementation in the five BHU (start of the 2nd semester of 2018 to the 1st semester of 2019) and after AA implementation in the five BHU (start of the 2nd semester of 2019 to the end of the 1st semester of 2020).

Statistical analysis was performed using R software, version 4.1.2®20. The analysis was performed using absolute numbers and proportions. Differences between proportions were tested using Fisher's Exact test. A significance level of 5% was considered. This study adhered to the ethical standards for research involving human subjects.

RESULTS

To ensure the anonymity of the BHUs, instead of using their names, the BHUs have been designated A, B, C, D, and E. The data show that BHUs A, B, and C had a higher UPC before the implementation of AA. BHU A had a UPC >0.6 to 1 in 81% of its services before the implementation of AA, increasing to a UPC >0.6 to 1 in 74.8% of services one year after the implementation of AA (p-value = 0.604). BHU B had a UPC >0.6 to 1 in 91.6% of its services before the implementation of AA, increasing to a UPC >0.6 to 1 in 78.2% of services one year after the implementation of AA (p-value = 0.217). Not unlike this, BHU C had a UPC >0.6 to 1 in 77.4% of its services before the implementation of AA, and went on to have a UPC >0.6 to 1 in 55% of services after 1 year of the implementation of AA (p-value=0.218), this being the BHU with the most compromised longitudinality after the implementation of AA.

In contrast, BHU D and E demonstrated an improvement in UPC after the implementation of AA. The BHU D had a UPC >0.6 to 1 in 38.8% of its appointments before the implementation of the AA, rising to a UPC >0.6 to 1 in 81.5% of appointments one year after the implementation of the AA (p=0.0017). And BHU E had a UPC >0.6 to 1 in 60.8% of

its appointments before the implementation of AA, and had a UPC >0.6 to 1 in 84.6% of appointments after 1 year of the implementation of AA (p=0.00), (Table 1). The only statistically significant difference was identified in BHU D.

Table 1: Distribution of UPC data, before the implementation of AA (P1), during the implementation of AA (P2), and after one year of the implementation of AA (P3), in the 5 BHU, São Paulo, SP, 2021.

	BHU A						**BHU B**						**BHU C**						**BHU D**						**BHU E**					
N	52						79						40						56						68					
	P1		P2		P3		P1		P2		P3		P1		P2		P3		P1		P2		P3		P1		P2		P3	
UPC	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
*UWM	15		5		4		20		8		6		9		5		0		17		9		2		27		18		3	
0	1	2.7	3	6.3	4	8.3	2	3.4	5	7.0	10	13.7	3	9.7	2	5.7	11	27.5	11	28.2	3	6.4	2	3.7	5	12.2	3	6.0	1	1.5
0.1	1	2.7	1	2.1	1	2.8	0	0.0	0	0.0	0	0.0	0	0.0	1	2.9	0	0.0	1	2.6	0	0.0	0	0.0	0	0.00	0	0.0	0	0.0
0.2	0	0.0	1	2.1	3	6.2	0	0.0	0	0.0	1	1.4	0	0.0	1	2.9	4	10.0	1	2.6	1	2.1	1	1.8	1	2.4	1	2.0	1	1.5
0.3	2	5.4	1	2.1	2	4.1	0	0.0	1	1.4	0	0.0	1	3.2	2	5.7	3	7.5	3	7.7	1	2.1	2	3.7	2	4.9	1	2.0	3	4.6
0.4	0	0.0	2	4.2	0	0.0	0	0.0	1	1.4	2	2.7	0	0.0	0	0.0	0	0.0	4	10.3	1	2.1	2	3.7	3	7.3	1	2.0	1	1.5
0.5	3	8.1	12	25.5	2	4.1	3	5.1	2	2.8	3	4.1	3	9.7	3	8.6	4	10.0	4	10.3	3	6.4	3	5.6	5	12.2	3	6.0	4	6.1
0.6	0	0.0	3	6.3	3	6.2	2	3.4	0	0.0	1	1.4	0	0.0	2	5.7	2	5.0	2	5.1	1	2.1	1	1.8	5	12.2	2	4.0	3	4.6
0.7	2	5.4	9	19.1	9	18.7	8	13.6	6	8.4	11	15.1	3	9.7	3	8.6	3	7.5	3	7.7	5	10.6	9	16.7	9	21.9	7	14.0	17	26.1
0.8	2	5.4	0	0.0	6	12.5	4	6.8	3	4.2	4	5.5	5	16.1	7	20.0	2	5.0	1	2.6	4	8.5	5	9.3	1	2.4	2	4.0	5	7.7
0.9	2	5.4	0	0.0	3	6.2	3	5.1	7	9.9	4	5.5	3	9.7	1	2.9	0	0.0	0	0.0	5	10.6	3	5.6	1	2.4	7	14.0	5	7.7
1	24	64.8	15	31.9	15	31.2	37	62.7	46	64.8	37	50.7	13	41.9	13	37.1	11	27.5	9	23.0	23	48.9	26	48.1	9	21.9	23	46.0	25	38.5
Total	37	100	47	100	48	100	59	100	71	100	73	100	31	100	35	100	40	100	39	100	47	100	54	100	41	100	50	100	65	100
>0.6 a 1		81.0		57.3		74.8		91.6		87.3		78.2		77.4		74.3		55.0		38.8		80.7		81.5		60.8		82		84.6

* UWM: Users without medical or nursing care during the study period

P1: Period corresponding to 1 year before the implementation of the AA (beginning of the 2nd semester of 2017 to the end of the 1st semester of 2018)

P2: Period corresponding to the year during the implementation of the AA (beginning of the 2nd semester of 2018 to the end of the 1st semester of 2019).

P3: Period corresponding to 1 year after the implementation of the AA (beginning of the 2nd semester of 2019 to the end of the 1st semester of 2020).

The data show that BHU A, BHU B, and BHU C had a higher UPC before the implementation of AA. In other words, for these BHUs, the implementation of AA compromised the longitudinality of care. In contrast, BHU D and BHU E demonstrated an improvement in the UPC after the implementation of AA. These distinct results with these two BHUs may have been directly influenced by the model adopted by managers of not having sister teams for BHU E since the beginning of the AA implementation, and the withdrawal of sister teams from BHU D throughout the AA implementation process. This event, which by its very nature would help FHS improve their longitudinality of care, proved to be an obstacle to the performance of this attribute. No correlation was found in the literature between sister teams interfering with the longitudinality of care.

DISCUSSION

In Brazil, no studies were found that used the UPC method to measure longitudinality of care. A study conducted with users with high blood pressure who were followed for at least one year at the Primary Care Clinic of the University of Malaya Medical Center found that the average UPC was 0.43, indicating that longitudinality of care did not directly affect blood pressure control[21].

Another study aimed to measure continuity of care in a general practice with 9,409 patients in the United Kingdom, where they obtained an average UPC score of 0.61[22]. Continuity of care for people with diabetes, correlating with avoidable hospitalizations in Taiwan, showed a UPC <0.75, with these results being significantly associated with an increased risk of hospitalization compared to users with high continuity of care[23].

For longitudinal care to exist, it is necessary to understand the patient, their family, and the community. Primary care fosters good interpersonal relationships and bonds of trust, serving as a link between the user and health services in all their dimensions[4]. Research carried out in southern Brazil[7], found that, for most respondents, the health professional does not know them as a person, but only as someone with a health problem, which demonstrates that the traditional curative model focused on the disease remains present in PHC services.

Rose KD, Ross JS, Horwitz LI[24], evaluated the effects of AA on user satisfaction, and the results showed that AA was associated with a reduction in continuity of care, which can lead to a worsening of care quality and user health in the long term. Similarly, in a systematic review, Lin, W. et al. concluded that AA can lead to fragmentation of care, increasing the risk of medication errors and poor user outcomes[25].

Similarly, in 2018 in the United Kingdom, the impact of AA on the quality of primary care was evaluated[26]. The results showed that AA was associated with reduced continuity of care and decreased patient satisfaction. In the same period, a 2017 study in the United States compared continuity of care between patients seen in physicians' offices with and without AA[27]. The results showed that AA was associated with a reduction in continuity of care and an increase in the use of emergency services.

Brazilian studies[18,28,29] contradict the results mentioned above. However, these studies did not evaluate continuity, but they do mention that continuity improved. It is important to note that not all studies support the relationship between AA and longitudinality, and that more research is needed to fully understand the impacts of AA on care.

In the present study, the longitudinality attribute of care was impacted by the implementation of AA. This result may be influenced more by planning and administrative issues, such as the absence of sister teams in the units included in this study, than by the inadequacy of the AA model itself.

Balancing attributes, access, and longitudinality is a delicate position, because stating that it is not possible to improve access because it will undermine the longitudinality of care is practically saying that people will have to choose between an “accessible” service or a “continuous care” service. In fact, as advocates of PHC, it is important to pursue and strive to build services that possess both attributes, that is, services that are accessible and ensure the longitudinality of care.

It is concluded that the longitudinality of care attribute was due to planning and coverage problems in the BHUs in the southern region of the city of São Paulo. Such problems cannot be attributed solely to the implementation of the Advanced Access model.

FINAL CONSIDERATIONS

The study's purposes were achieved, but there are some limitations that should be considered. The outcomes presented in this context highlight the importance of conducting additional longitudinal studies in units using the Advanced Access model. Therefore, it is recommended that future research include empirical analyses capable of providing a more comprehensive perspective on the subjects addressed.

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ANALYSIS OF THE LONGITUDINALITY ATTRIBUTE WITH THE IMPLEMENTATION OF THE ADVANCED ACCESS MODEL: MULTIPLE CASE STUDY

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