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Artigo Original

UNA-SUS system as a democratization tool for Permanent Education in Health: user profile and capillarization of self-instructional courses

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Abstract

UNA-SUS System was established to enforce the National Policy of Permanent Education in Health, composed of a network of 34 institutions responsible for online educational offerings, in response to the demands generated by the Ministry of Health. **Objectives:** to verify the profile of users and the capillarization of UNA-SUS self-instructional courses and the contribution to the democratization of permanent education of health workers. **Methods:** data were collected from Arouca Platform and statistical analysis was performed by the Open Free Software R 3.6. **Results:** there were more than 2.7 million enrollments in UNA-SUS self-instructional courses with a capillarity for all health regions, Brazilian municipalities state. Courses with the greatest demand were related to

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important clinical situations faced by the Primary Care professionals in Brazil. There was a predominance of women (80%), whites (36%), followed by browns (33%), singles (57%) and in the age group of 21 to 40 years (70%). Nurses, doctors and dentists were the professionals who most sought courses at UNA-SUS. There was no relationship between enrollment in population-weighted self-instructional courses and the state HDI, but a negative relationship was established between the Gini coefficient and enrollment in courses, showing that the more unequal the region, the fewer enrolled students it had. **Conclusion:** the UNA-SUS System proved to be effective in providing permanent education to health workers living in all Brazilian geographic regions, including those with few presential or free educational offerings, contributing to the democratization of Permanent Education in health.

Keywords: self-instructional courses – permanent education – Distance Education.

1. Introdução

In 1978, the Pan American Health Organization (PAHO) conceptualized Permanent Education in Health (EPS) as a dynamic process of teaching and learning, active and continuous, with the purpose of analyzing and improving the training of people and groups, facing technological evolution, social needs and institutional objectives and goals (MICCAS; BATISTA, 2014). EPS is described by Unesco based on the principle that man is educated throughout his life, paying attention to his personal and professional development, the evolution of capacities, motivations and aspirations, and his needs are not always of an emerging character (DAVINI, 1994).

The Brazilian historical context during the 1980s justified the interest and mobilization around the theme of EPS, as the country was experiencing the Sanitary Reform Movement, which culminated in the structuring of a new health model - the Unified Health System (SUS), whose proposal presents health as a right of every citizen and a duty of the State (PAIVA; TEIXEIRA, 2014).

Subsequently, the National Policy for Permanent Education in Health (PNEPS) was implemented to align the need to reorient the services provided in the Unified Health System, whose expansion of supply and complexity are increasingly greater (BRAZIL, 2007; BRAZIL, 2018). The two ordinances (GM nº 198/2004 and GM nº 1.996 / 2007) referring to this policy propose that the qualification processes of workers take as reference the needs and the local reality of health, which have as objectives the transformation of professional practices and the organization of work itself, and that they are, above all, structured from the problematization of health work processes (CARDOSO *et al*., 2017).

Considering the extent and specificity of the Brazilian regions, the distribution of health services across the national territory, as well as the routines and demands of these services, which require the maintenance of professionals in their posts for their proper functioning, Distance Education (EaD) has been an important tool for PNEPS, providing health professionals with training and updating, whose time is, in most cases, scarce for the realization of a face-to-face course, especially those residing in remote regions, where there are few offers (CAMPOS; SANTOS, 2016; CEZAR; COSTA; MAGALHÃES, 2017). In Brazil, the distance education modality obtained legal support for its realization with the Law of Directives and Bases of Education, which establishes the possibility of organic use of the distance education modality at all levels and modalities of education (BRAZIL, 1996).

In this sense, the Open University System of the Unified Health System (UNA-SUS) was instituted, composed of a network of 34 public institutions of higher education and federal institutes accredited by the Ministry of Education (MEC) responsible for offering distance education. These offers are generated by demands produced by the Ministry of Health (MH) (BRAZIL, 2010).

Through Interministerial Ordinance No. 10, of July 11, 2013 (BRAZIL, 2013), an Advisory Council, an Institutional Collegiate and an Executive Secretariat for the UNA-SUS Network were instituted. The Advisory Council is responsible for receiving from the MS, discussing and presenting the projects, proposals, training and qualification actions to the Institutional Collegiate Body, with the establishment of

priority lines of action and on the feasibility of them being carried out by UNA-SUS. The Institutional Collegiate of UNA-SUS is responsible for defining the form and means of implementing the proposals and actions sent by the Consultative Council under UNASUS and defining the mechanisms for selecting the institutions that make up the UNA-SUS Network and that will participate in each priority action. It is composed of representatives from the Secretariat for the Management of Labor and Health Education (SGTES / MS), the Oswaldo Cruz Foundation (Fiocruz) and PAHO. The Executive Secretariat will be exercised by Fiocruz.

UNA-SUS has an Educational Health Resources Collection (ARES, 2021), where all public technologies, educational experiences and materials produced by the system are deposited. Considered today as the largest digital health collection in Latin America, ARES brings together thousands of educational resources that deal with different themes of free access and reuse, produced by the educational institutions that make up the UNA-SUS Network. In December 2019, we observed more than 10,000 (ten thousand) materials deposited (8789 Course Completion Papers; 1544 texts; 1441 videos; 236 images; 553 multimedia materials, 64 tables; and 52 institutional documents) at ARES.

The System also has a platform created to serve as a site for the national database, being integrated to the SUS information system, the Arouca Platform, where the courses 'offers are found, as well as the registration of the students' activities, its professional certificates and activity reports (PLATAFORMA…, 2021). In this platform, it was informed, in December 2019, that there are more than 2.5 million enrollments in 435 health regions in the 27 Federative Units, in a total of 829 educational offers.

Based on the guidelines of the National Policy for Popular Education in Health (PNEPS) and considering that permanent education is understood as lifelong learning at work, UNA-SUS proposes actions to meet the needs for training and permanent education, inducing and guiding the offer of specialization, improvement and other types of qualification courses and programs aimed at SUS workers (BRAZIL, 2010).

In this study, we sought to verify the profile of users and the capillarization of the self-instructional courses of UNA-SUS throughout Brazil and how much this system has expanded the scale and scope of educational activities, contributing to the reduction of inequalities between different regions of the country. country and increasing the democratization of continuing education for health workers.

2. Material And Methods

2.1. Survey of self-instructional courses and their users

Data regarding students entering and graduating from self-instructional courses without tutoring, offered by UNA-SUS, will be considered since the formation of the network. The survey of enrollments and sociodemographic data of users was done through an extraction with the variables of interest in the database of the Platform Arouca, integrated with the base of the National Register of Health Establishments (CNES). All offers of courses that have tutors and all enrollments in which users' CPFs were not found in the CNES registration base were excluded. The extractions were carried out in September 2019 and refer to the total number of offers since the establishment of the UNA-SUS System.

A spreadsheet in PowerBI® was generated for data analysis. From this spreadsheet, auxiliary spreadsheets were created with the groupings of the variables, according to the analyzes of interest, allowing to verify the distribution of enrollments in self-instructional courses in Brazil and the profile of SUS workers enrolled in these courses. Excel® and Tableau® were used to present the data.

2.2. Relationship between the location of SUS workers and the Gine and HDI indexes of the states where these workers work

In order to verify whether there was a relationship between the location of SUS workers who sought self-instructional courses and measures of social inequality and human development, spreadsheets referring to Brazilian states were exported to the Gini and HDI-M coefficient. For the HDI-M, on the website of the Atlas of Human Development in Brazil (http://www.atlasbrasil.org.br/consulta), a spreadsheet was generated in Excel®, choosing, as Spatiality, "States", and then , "All States - Brazil" in "Indicators". "MHDI" is selected as Dimension, "MHDI" as Theme and, in Indicators, "All" was selected, so that a spreadsheet that generated the MHDI, the MHDI Income, the MHDI Longevity and the MHDI Education was generated.

For the Gini coefficient, a spreadsheet published on the Ministry of Health website (http://tabnet.datasus.gov.br/cgi/ibge/censo/cnv/ginibr.def) was exported, exported from IBGE, comparing this index in the last census survey of Brazilian municipalities in 2010.

2.3. Statistical analysis

After the descriptive analysis of the data, a Bayesian spatial model was used to verify the effect of the Gini coefficient and the average HDI on student adherence to UNA-SUS courses. A Bayesian spatial model can be understood as an extension of a hierarchical model that takes into account similarities based on neighborhood or distance (BLANGIARDIO; CAMALETTI, 2015).

In this case, a conditional autoregressive model was used to deal with the presence of correlation between the residues. It was assumed that the adherence variable follows a Poisson distribution, and little informative priors were assigned to all parameters of the model. For the posterior calculation, the Integrated Nested Laplace Approximation (INLA) approach was used. The analyzes were performed using the free statistical software R 3.6.1 (R Development Core Team 2019). Details

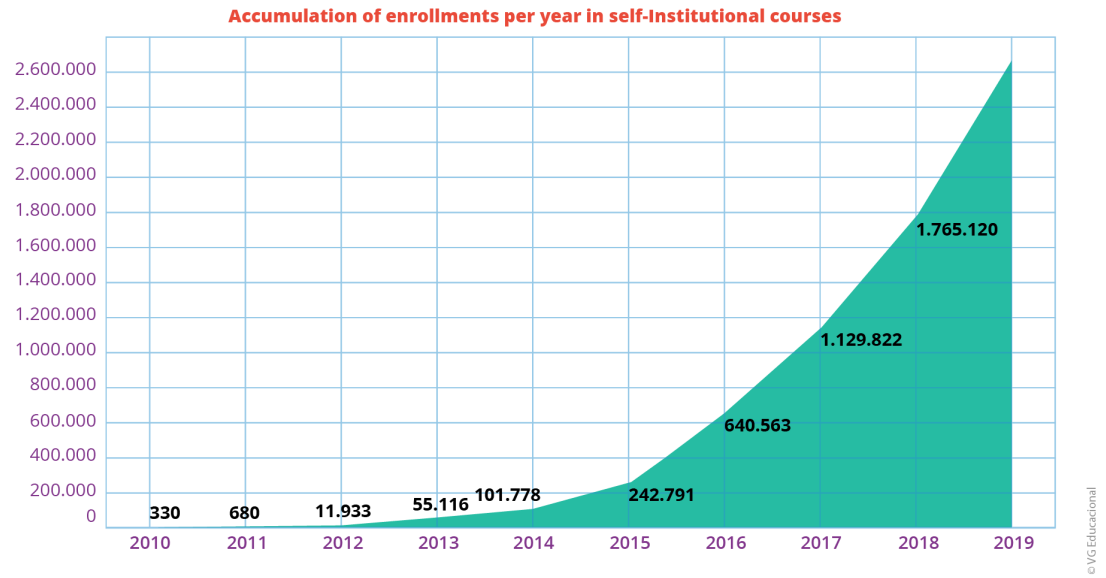
on the packages and commands used can be found in the available supplementary material (S1 - script).

3. Results

3.1. Survey of self-instructional courses at UNA-SUS

UNA-SUS has already offered 256 self-instructional courses in 467 offers, and on December 18, 2019, 61 of them had an open offer, totaling an additional 2.6 million enrollments. The data used in this study refer to data from completed offers (Figure 1).

Figure 1 - Enrollment in self-instructional courses offered by UNA-SUS from 2010 to 2019

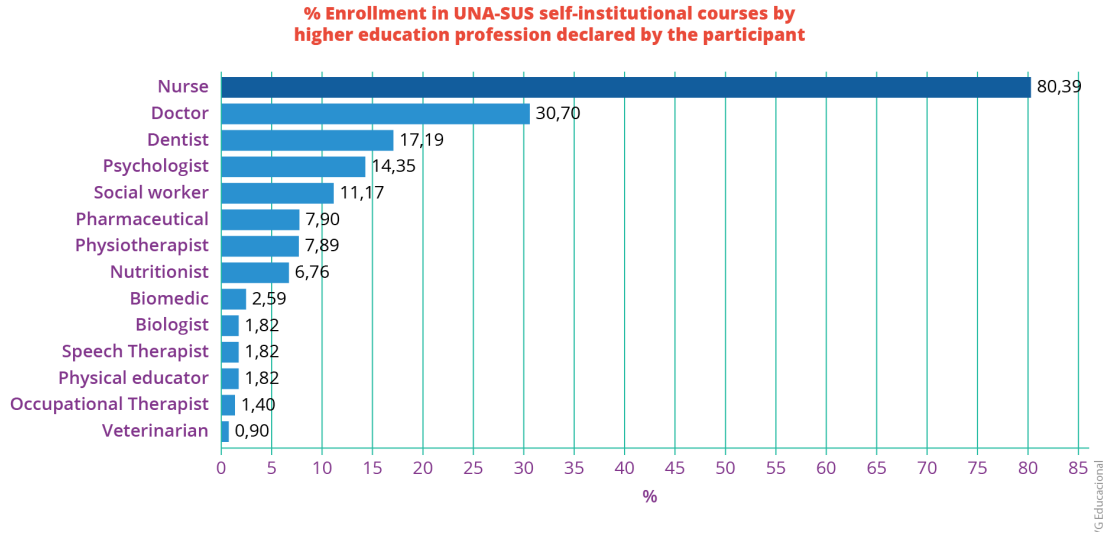


Source: Prepared by the authors.

A descriptive analysis of the users of these courses shows that, considering only health professionals with higher education, the majority were composed of nurses (80.39%), followed by doctors (30.70%) and dentists (17.19 %) (Figure 2). Most users are between 21 and 40 years old, totaling more than 70% of all enrollments, with a predominance of females (79.98%) (Figure 3). Most users declared themselves to be

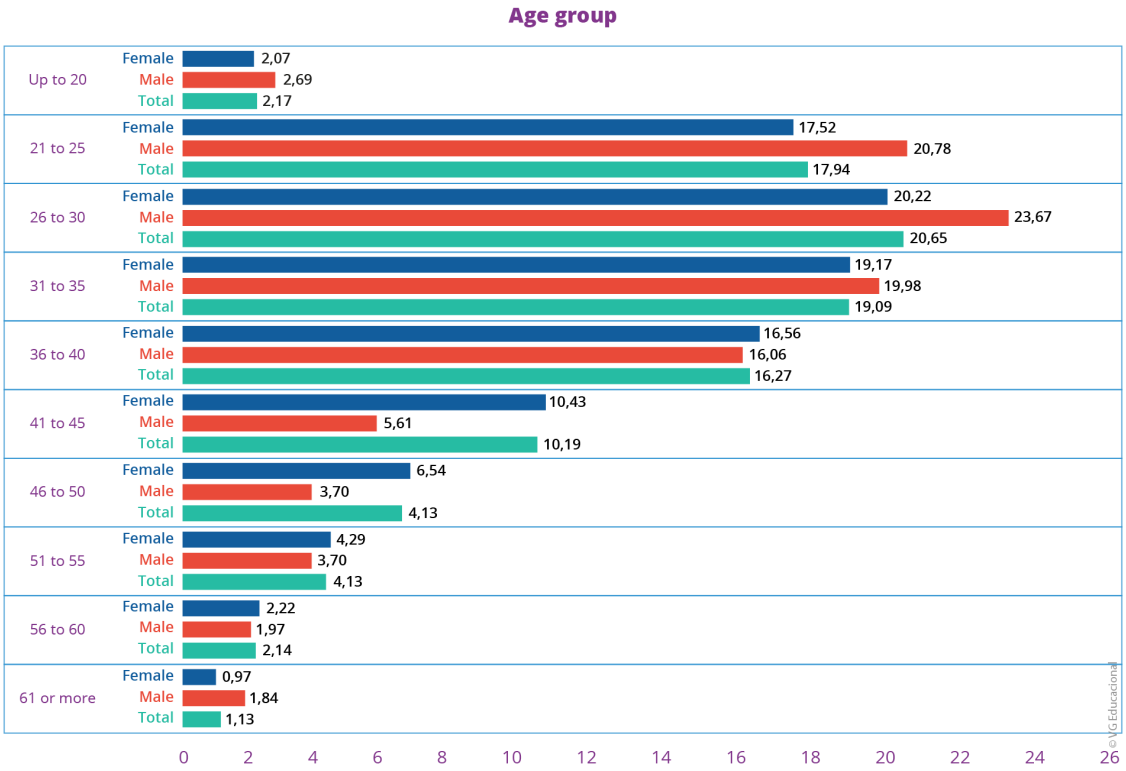
white (1,015,949, that is, 36.46%) or brown (928,317, that is, 33.31%). Blacks, yellows and Indians represented 9.82% of users. In total, 20.40% of users do not declare themselves. Considering marital status, 57.14% declared themselves unmarried; and 25.89%, married.

Figure 2 - Percentage of enrollments in self-instructional courses, categorized by higher health professions



Source: Prepared by the authors.

Figure 3 - Distribution of those enrolled in self-instructional courses by gender and age groups



Source: Prepared by the authors

The Federal University of Maranhão was the institution whose courses had the highest number of enrollments (452,233), followed by the Executive Secretariat of UNA-SUS (373,788), the Federal University of Santa Catarina (254,603) and the Federal University of Health Sciences of Porto Alegre (207,755). The courses address the most diverse themes in the health area, from specific subjects, such as diagnosis and treatment of diseases, to broader themes, such as public health management and policies. The courses with the highest number of enrollments by modality are shown in Table 1.

Table 1 - Self-instructional courses with the highest number of enrollments

Course	Enrollment
Leprosy in Primary Care	**127.339**
Zika: Clinical Approach in Primary Care	**85.346**
Clinical Management of Chikungunya	**69.471**
Health of the Black Population	**49.503**
Introduction to Health Assessment (Focus on Primary Care)	**49.176**
National Comprehensive Health Policy for Lesbians, Gays, Bisexuals, Transvestites and Transsexuals	**47.143**
The work process in SUS and the importance of Health Planning Actions	**43.098**
Clinic Management in Primary Care	**40.273**
Update on Clinical Management of Dengue	**37.655**
For them: comprehensive health care for women in situations of violence	**34.297**

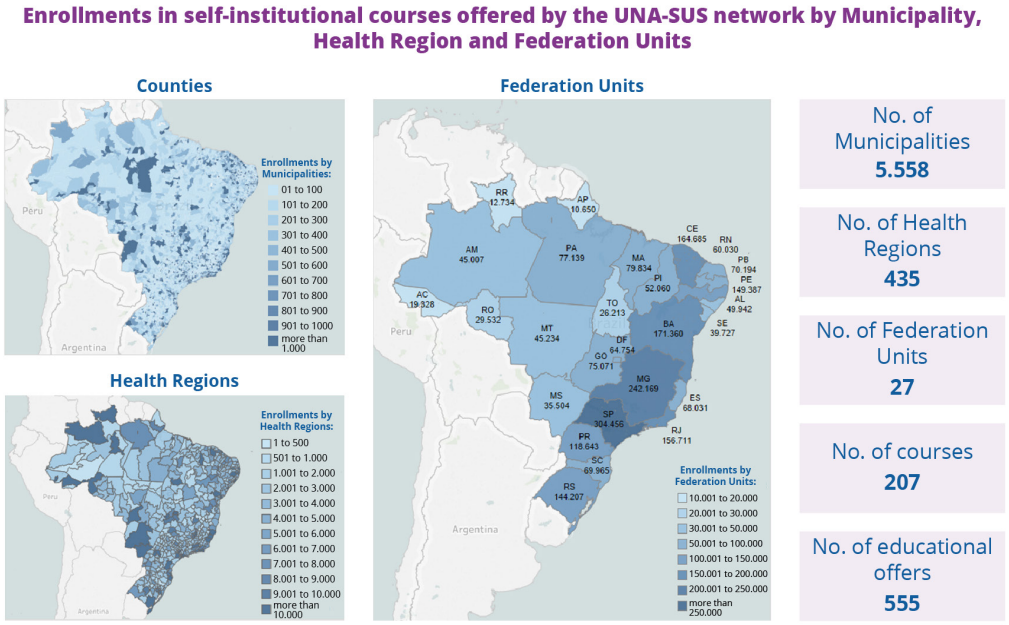
Source: Prepared by the authors.

3.2. Distribution and capillarity of self-instructional courses at UNA-SUS

The capillarity of self-instructional courses at UNA-SUS can be seen in Figure 4. Self-instructional courses were enrolled in all Federative Units in Brazil. All Brazilian states had a higher number of enrollments in self-instructional courses than the number of SUS employees registered with CNES.

Considering the data registered with CNES and DataSUS, the states with the highest number of enrollments were São Paulo, Minas Gerais and Bahia, with 250,447, 203,080 and 138,060, respectively. These data represent adherence to the courses of 35, 59 and 73% of the total health workers in the states (718,209, 344,978 and 189,705, respectively) (INEP, 2019). The completion rate for self-instructional courses ranged from 24.48% for the state of Maranhão to 35.22% for Acre.

Figure 4 - Capillarity in the Brazilian territory of the self-instructional courses offered by UNA-SUS



Source: Prepared by the authors.

All Brazilian municipalities had enrollments in self-instructional courses offered by UNA-SUS, led by the city of São Paulo, with 85,753 enrollments, followed by Fortaleza, with 61,155 enrollments, and Rio de Janeiro, with 59,463. A total of 477 cities registered a maximum of 10 enrollments in self-instructional courses, for example: Lagoa do Piauí (PI) and Cajazeirinhas (PB). Of these municipalities, only 8 have more than ten CNES registrations for health workers.

The health regions with the highest number of enrollments in self-instructional courses at UNA-SUS, by federation unit, are: SP - São Paulo (99,028), RJ - Metropolitana (94,807), PE - Recife (86,865), CE - First Region Fortaleza (72,446) and DF - Distrito Federal (65,431). By federation unit, the health teams that had the highest number of enrollments were: AC - PACS - CS Deusimar Pinheiro (n = 333), AL - NASF III - Centro (n = 104), AM - PSF Ilha Redonda (n = 47), AM - ESF-239 (n = 98), BA - Health Center - Urban Zone I (n = 178), CE - Headquarters II (n = 266), DF - ESF 22 EQ 412 Blue (n = 97), ES - Notice (n = 144), GO - PSF Coimbra (n = 207), MA - Centro (n = 180), MG - USF Urban (n = 182), MS - EACS - Santo Andre (n = 128), MG - PSF Novo Horizonte (n = 171), PA - Inussun (n = 98), PB - PSF Contendas (n = 139), PA - Rural

(n = 257), PE - PACS 24 (n = 174), PI - Family Health Unit (n = 187), RJ - PSF Ponta Grossa (n = 76), RN - Team (05) - São Judas Tadeu (n = 257), RS - PACS (n = 146), RO - Jacy Paraná (n = 97), RR - ESF - União (n = 60), SC - Family Health Strategy II (n = 211) , SP - Team IIII (n = 337), SE - City (n = 79), TO - City (n = 159).

3.3. List of enrollments in self-instructional courses in relation to Development Indicators

In this study, no relationship was found between the number of enrollment in self-instructional courses weighted by the population and the state HDI, and it is not possible to establish whether the increase of 0.01 points in this indicator would reflect, on average, an increase or decrease in the number of enrollments. . The Gini coefficient showed a negative relationship with the number of enrollments in the courses. In this case, the 0.1 point increase in this indicator led to an average student loss (Estimated = - 0.9, 95% CrI = - 1.3; -0.4).

4. Discussion

Permanent Education in Health (EPS) presents the proposal of educating "in" and "for" work. In this sense, SUS presents itself as an adequate place to work the teaching and learning processes, making it more democratic, equitable and efficient. (BRAZIL, 2018; LEMOS, 2017; MEDEIROS et al., 2010; MICCAS; BATISTA, 2014).

PAHO reinforces the EPS proposal as a mechanism for the development of the conditions and capacities of human resources in health (PAHO, 2017; ROVERE, 1996). When considering permanent education, it is important to think about the theoretical assumptions of andragogy, in which adult learners need to know to what extent the knowledge to be acquired may be useful to them. (DRAGANOV; FRIEDLÄNDER; SANNA, 2011).

Education at work makes it possible to recompose work processes, so that SUS workers can recognize, negotiate and respond in a more

pertinent way to the users' health needs, seeking to ensure rights and quality in the provision of services and in the perspective of strengthening of the system (CEZAR; COSTA; MAGALHÃES, 2017; SODRÉ et al., 2016). It is in this context that the National Policy for Popular Education in Health (PNEPS) was instituted and, for its fulfillment, the UNA-SUS System was created as a proposal for the realization of this policy, offering distance courses in different modalities, with or without the tutoring mediation (BRAZIL, 2010).

Currently, distance education is used at all levels of education, including formal and informal courses, serving millions of students, both public and private (REICH, 2015). In Brazil, we see an increase in supply and demand for distance learning courses, accounting for 9,374,647 enrollments, 3,627,327 of which are in non-corporate open courses (ABED, 2019), such as those offered by UNA-SUS, which represent approximately 49 % of that total. In health, distance education is an important EPS strategy, as it provides opportunities for training and qualification, enabling a better use of available time, in which the student has better control and management of his educational process (CEZAR; COSTA; MAGALHÃES, 2017).

Distance education is still seen as a novelty by many health professionals, such as participants in the Mais Médicos Program, but it no longer represents an impediment to the identification of the potential in this type of teaching, contributing to the training and qualification of practices professionals' daily lives, both in relation to their individual clinical performance and in conducting teamwork (CEZAR et al., 2019).

With regard to dropout rates, national data indicate that the majority of free non-corporate courses offered (40.3%, excluding 22.8% of undeclared data) have dropout rates between 16% and 50%. UNA-SUS courses have an average completion rate of 30.94%, values similar to the Census and higher than other studies that evaluate evasion in online self-instructional courses (OLIVEIRA; OESTERREICH; ALMEIDA, 2018; JORDAN, 2015; REICH, 2014).

There are many speculated causes for dropout rates in online courses,

although there is a variation depending on the institution and the course modality. But, in general, the main reasons given by users are: lack of time to dedicate themselves to the course, content that does not meet expectations, inadequate didactic material, inadequate technology or lack of resources to fund the course (OLIVEIRA; OESTERREICH; ALMEIDA, 2018; KIZILCEC *et al*., 2017; MACHADO; PRADO, 2016; TAMARIZ; SOUZA, 2015; FRANKOLA, 2001).

It is necessary to consider that there are those users who take the course with no interest in completing it, either because they do not need the certification offered, or because they are interested in updating themselves in only some of the course modules (JORDAN, 2015). In a previous study, Harvard University, through a questionnaire applied to students before the start of the edX Platform courses, investigated the intention to complete the course and observed that 58% of them had the intention of certification, 25% only to evaluate the course, 14% were unsure whether they wanted certification and 3% just intended to navigate the course. Only 22% of those who intended to certify, in fact, finished the course, and a maximum of 10% of those belonging to the other groups completed the course (REICH, 2015).

To say that the lack of intention to certify would be the justification for the low conclusions is criticized, because even in the platforms that offer the possibility to complete the course for free, without certification, or to be certified through the payment of a fee, completion rates are low (REICH; RUIPÉREZ-VALIENTE, 2019; LEDERMAN, 2019).

The results of this study show that UNA-SUS contributes to the expansion of access to EPS in remote regions of the country, since all Brazilian municipalities have been enrolled in at least one course. Given the appropriate proportions, the number of enrollments in self-instructional courses can be compared with major world platforms that offer courses in all areas of knowledge, without restriction, such as Coursera (38 million), EdX (18 million) and XuetangX (14 million) (SHAH, 2018), with 39% of these enrollments located in underdeveloped countries (ZHENGHAO et al., 2015).

When searching for courses in the health field, few self-instructional

courses are observed in proportion to the amount offered in other areas of knowledge. In a previous study, only 376 courses were found in the "health and society" category, representing only 8.19% of the 4,593 courses available on MOOC-List.com, with courses registered on the main world platforms (BRITES; ROCHA, 2017) . Of these courses, the Coursera platform offered 142 (37.77%); FutureLearn, 59 (15.69%); and edX, 54 (14.36%). Again, the expressiveness of UNA-SUS numbers needs to be emphasized, due to the almost 2.7 million enrollments in only courses in the health area and designed for EPS.

The data from UNA-SUS courses can be related to the enormous expansion of Primary Care in Brazil, which occurred in the last two decades (BRASIL, 2017). According to the CNES database, all primary care health teams were enrolled in UNA-SUS courses. There are more than 2,457,210 workers linked to SUS, in the various areas of activity and in the most different Brazilian Occupation Codes (COB), distributed among the States of the Federation, with 800,405 professionals with higher education. Of these, nurses (230,018), doctors (278,479) and dental surgeons (61,845) are the professionals with the greatest number in SUS (CNES, 2021; PEREIRA JUNIOR; RUAS, 2019).

The state of Roraima has the lowest number of professionals (9,189), and São Paulo would be the state with the highest number of professionals (522,309). Reflecting a similar proportion of these professionals, nurses, doctors and dentists were the professionals who most enrolled in self-instructional courses at UNA-SUS. This proportion is related to the changes in human resources observed with the evolution of SUS in the last 30 years, in which there was a greater increase in health professionals in general, more specifically in Primary Care Units (AB), thus demonstrating the effects of specific policies, such as the National Primary Care Policy and the Mais Médicos Program (VIACAVA *et al.*, 2018).

The courses that had the most enrollments date back to epidemiological emergencies that occurred in the last decade, requiring updating by health professionals. The offerings of "Leprosy in Primary Care" courses had a higher number of enrollments, possibly due to the increase in cases that occurred in recent years. In 2016, 25,218 new cases

were reported, with a detection rate of 12.2 / 100 thousand inhabitants (BRASIL, 2020).

The high demand in the courses related to arboviruses Zika, Chikungunya and Dengue refers to the outbreaks that have occurred in Brazil and South America recently (PATTERSON; SAMMON; GARG, 2016). In 2013 and 2014 there was an epidemic outbreak of Chikungunya in South America and the Caribbean (CDC, 2019a). Dengue is the most prevalent and dangerous arbovirus infection, with an estimated 96 million new cases in 2013 alone (CDC, 2020).

For many decades, Zika has obtained little concern for medical attention, but in 2016, the World Health Organization officially declared arbovirus as a Public Health Emergency of International Concern (GULLAND, 2016), as 1,3 million cases in Brazil alone and that the virus has spread to more than 33 countries or territories (CDC, 2019b; PETERSEN et al., 2016).

In addition to these courses, the courses "Health of the Black Population", "National Policy for the Comprehensive Health of Lesbians, Gays, Bisexuals, Transvestites and Transsexuals (PNSILGBT)" and "For them: comprehensive health care for women in situations of violence" deserve to be highlighted, as they show a change in the behavior of health workers and a concern with cross-cutting themes that have great significance when considering the comprehensive care that is desired in Primary Care.

There are also alarming data on the health of the black population that require greater attention from health workers, such as high levels of suicide (BOTEGA, 2014) and the prevalence of structural racism in institutions (OLIVEIRA; CARVALHO, 2017).

There have been considerable advances in society in relation to the Lesbian, Gay, Bisexual, Transvestite and Transsexual (LGBT) community, and SUS seeks to adapt itself through the PNSILGBT and other actions, such as the Transexualizador Process (PrTr). But Brazilian society still faces a heteronormatizing process that excludes people who do not fit the standards imposed by conservative groups and end up

suffering prejudice, discrimination and violence (SOUZA et al., 2015).

In a study analyzing medical training for health care for the LGBT population, it was observed that there are deficiencies from the medical school curriculum formation to weaknesses in the daily care of LGBT health care (NEGREIROS *et al*., 2019). As health professionals can make a substantial contribution to improving the quality of access to basic health services and humanized care for this population, the high demand for this course demonstrates the interest and the paradigm shift that has been taking place in the conduct of patients. Health professionals.

The search for the course "For them: comprehensive health care for women in situations of violence" denotes the interest of health professionals in working to face violence against women, which results in damage to individual and collective health, with an impact on mortality throughout society, demanding, for their prevention, their coping, articulated policies and actions that aim to serve women in their entirety (MENEZES *et al*., 2014; LETTIERE; NAKANO, 2015).

In Brazil, most EaD students are female (51%) (ABED, 2019), similar to the Census for face-to-face graduations, in which women represented 60% of graduates in undergraduate courses (INEP, 2019). In this study, the values observed for UNA-SUS are higher (79%), possibly because there is a predominance of women in health (RICOLDI; ARTES, 2016).

The feminization of the health workforce has been a topic of discussion for decades, and the expansion of the capacity of women, the municipalization of jobs, the outpatient care, the higher qualification of the team and the flexibility of work bonds can be explanations for the presence of women in health spaces (MATOS; TOASSI; OLIVEIRA, 2013).

There are those who believe that the predominance of female labor in the health sector occurs due to the fact that professional health activities are generally similar to those performed in the woman's daily life, such as family care (DURÃES; JONES; SILVA , 2010). Following

this reasoning, it is pertinent to reflect on the sexual division of labor, in order to seek equality between the sexes, identifying how the distribution of men and women in the labor market occurs, seeking to combat inequalities that generally work in a way systematic, which is also associated with different professional practices and, therefore, gender (BORGES; DETONI, 2017).

Racial inequality is still present in access to Brazilian education, although in recent years there has been a decline (REDAÇÃO, 2019). Indicators of racial inequality (years of study, failure, dropout, age-grade distortion, developed school curriculum, student performance, teacher-student relationship, quality of school equipment and location) have been released in recent years showing the disparities between whites and blacks in access, permanence and completion of school pathways (PASSOS, 2012).

National data on access to higher education, stratified by color and ethnicity, show that the difference between whites and browns was approximately double for the South, Southeast, Northeast and North regions, and 10 percentage points for the Midwest (IBGE, 2021). Data from the last Higher Education Census show that in 2018, of the total of 8,450,755 enrollments in on-campus and distance undergraduate courses, 42% represented whites and 36% were black or brown (INEP, 2019).

The results of enrollments in UNA-SUS courses show important data in the fight against racial inequalities, since there was a proximity between the number of enrollments of self-declared white people and those of black and brown people. Considering that the public of the courses evaluated is made up of health professionals, this result highlights the effectiveness of political actions to combat structural racism and to encourage access by blacks and browns to higher education, which have occurred in recent decades.

The predominant age group of students in non-corporate free courses is 26 to 30 years old (29%) (ABED, 2019), similar to UNA-SUS courses (21%). These data are expected, above all, for self-instructional courses, as it is an age group in which the user is active in the labor market and chooses distance education due to the flexibility of hours and

access (APAZA *et al*., 2014).

At the beginning of the system, UNA-SUS had as its guideline the expansion of access to EPS by SUS workers. Currently, the courses offered by UNA-SUS are a tool for the democratization of EPS, since the majority of SUS workers are in health regions located in areas with little or no opportunity for face-to-face education, as there is a concentration of healthcare institutions. Higher education in large centers, and huge areas with no offers (MOURA; CAVALCANTE, 2017).

In addition, the system is an instrument to reduce social inequalities, which start when a citizen is excluded from access to public services, such as health, safety, education, that is, the rights of any Brazilian citizen, or when the citizen receives these services. with low quality (OLIVEIRA; SILVA, 2015).

There was no relationship between the number of enrollment in self-instructional courses weighted by the population and the state HDI, possibly because, although we have inequalities in the different Brazilian regions for the HDI values, when establishing an average by state, there was a homogenization of the social aspects of the entire population, compensating for the differences in enrollments that exist at the municipality or region health level. In addition, there were enrollments in all states of the federation and in all municipalities, masking the data, if they were compared by health region within the municipalities.

However, with every 0.1 increase in the Gini index (which measures inequality), there was a loss of enrollment in self-instructional courses. That is, the more unequal a region was, the fewer students enrolled in the courses that region had. These data, possibly, would be even more alarming if, within each state, analyzes were made by municipality, since we are considering macro inequalities, those analyzed between states and large regions, without considering the heterogeneities existing within each state. , as already observed in previous studies on inequality in Brazil (RODRIGUES *et al*., 2017; Tavares; PÔRTO JUNIOR, 2011).

In order to investigate the most challenging points of self-instructional courses (enrollment, intention and conclusion), a study with the

edX platform (comparing two course producers: MIT and Harvard University) was conducted. In total, 565 courses with interactions in 261 countries and 12.67 million enrollments carried out by 5.63 million users.

The results showed that there was an increase in continuity and frequency in the course and in its certification in users from rich countries or with high levels of socioeconomic development (REICH; RUIPÉREZ-VALIENTE, 2019). Previously, a United Nations report showed that 80% of apprentices in self-instructional courses that completed the course were from countries with high or very high HDI (ONU, 2018).

5. Conclusion

Self-instructional courses at UNA-SUS are an effective EPS tool for health workers and for strengthening the SUS. The UNA-SUS system proved to be effective in providing permanent education for health workers residing in all geographic regions of the country.

The UNA-SUS system is an important tool for the democratization of Permanent Education in Health, allowing access to workers residing in areas with few on-site or free educational offers.

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