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ORIGINAL CONTRIBUTION

Child and adolescent psychiatry training in Brazil, Argentina, Uruguay and Chile: current panorama and future challenges

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Abstract

Mental disorders affect approximately 10–15% of children and adolescents worldwide. In South America these numbers are probably higher due to poverty and adverse life events that frequently affect this region. The availability of qualified services and well-trained professionals to care for those children are by far insufficient. The aim of this study was to assess and describe child and adolescent psychiatry (CAP) training in Brazil, Argentina, Uruguay, and Chile, to support the development and strengthen training standards. The coordinators of CAP residency programs in Brazil, Argentina, Uruguay, and Chile were invited to answer an online questionnaire about the characteristics of their training programs. Twelve programs from Brazil, three programs from Chile, two from Argentina, and one from Uruguay completed the questionnaires. In the last three countries, CAP is recognized as an independent specialty, while in Brazil it is considered a subspecialty of psychiatry. None of the countries have a national guideline for CAP residency training. Recently, there has been an increase in the number of professionals interested in pursuing a formal CAP training. This is the first study aiming to evaluate the current scenario of CAP training in South America. The results point to a great potential in the evaluated programs, but also to the need for homogeneous criteria for CAP training and evaluation of residents. A more efficient communication among programs would be an enriching strategy for their development, which may be facilitated by the results of this study.

Keywords Child and adolescent psychiatry (CAP) training · Skills · Competencies · South America

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Introduction

Mental disorders affect 10–15% of children and adolescents worldwide [1–3] and rates tend to be even higher in regions where children are exposed to adverse conditions, such as poverty, war, civil strife or natural disasters [4–6]. Surveys assessing representative national samples in South America are scarce, but in Chile a study reported a 22.5% rate of mental disorders [7]. In Brazil and Uruguay, studies with representative samples indicate rates of mental disorders of 13.1% [2] and 22% [8], respectively. After accidental injuries, mental disorders are the leading cause of disability worldwide in those aged 10–24 years [9].

The World Health Organization [10] advocates for the need of one child and adolescent psychiatrist (CAP) for every 30,000 children and adolescents. However, meeting this demand is still a worldwide challenge [11]. For instance, in Europe, the proportion varies from 1:2,648 to 1:78,950, with an average of one CAP for every 14,914 children and adolescents [12]. In Mexico, a country of more than 100 million inhabitants, there is only one child psychiatry hospital located in the capital [13]. Even in the USA, where the average is one CAP for every 2238 youth requiring mental health care, there is a concentration of CAP in large urban centers, in contrast to rural or deprived areas [14].

In low- and middle-income countries, where children are exposed to more social risk factors, the number of mental health services is even lower [15]. In South America, the current child and adolescent psychiatry scenario is concerning. In 2015, the population aged 0–19 years in this region was approximately 215 million [16]. Of these, 44% of children under 14 years of age were living in poverty and 14.6% were living in extreme poverty [17].

In Chile, there were 57 specialists recognized and certified by the National Autonomous Corporation of Certification of Medical Specialties (CONACEM) in 2000 [18]. This number has increased during the last two decades and according to the latest information provided by the Chilean Ministry of Health there are 356 CAP, corresponding to 2.15 CAP for every 30,000 children and adolescents. Currently in Argentina, there are 36 CAPs enrolled in the Asociación Argentina de Psiquiatría Infanto Juvenil for a population of approximately 10 million people under 14 years [16]. In Brazil there are 61 million children and adolescents [19]. Considering that at least 15% of this population presents a mental health disorder, the number of children and adolescents who would need specialized psychiatric care in South America is around 9 million. However, a recent study reported that 81% of children with mental disorders living in developed cities in Brazil did not receive treatment [20].

There are many different reasons for the difficulty in meeting the demand of services for children with mental disorders in South America. One of them is the stigma surrounding the diagnosis and treatment of mental health disorders in children and adolescents [21]. Another issue is the shortage of specialized services. For instance, in 2014, throughout Brazil, there were only 201 centers for psychosocial treatment of children and adolescents (CAPSi), where public treatment is offered to any child and/or adolescent with a mental health disorder. Of these programs, only 14 are located in the North- and Midwest Brazilian regions, which are the most deprived regions in Brazil [22]. In addition to the lack of specialized services for children and adolescents, there is a lack of trained professionals. In Brazil, in 2007 there were 107 professionals with a recognized CAP certificate [23], that is, one CAP for every 621,504 potential patients. Furthermore, in 2007 there were only 15 programs in Brazil offering training in child and adolescent psychiatry [23].

In the last ten years, there seems to have been an increase in the demand for specific training in South America and also in the number of accredited programs for CAP training. However, to the best of our knowledge, there is no recent data about the number and nature of accredited programs for CAP training, nor is there a minimum training curriculum established in South America. Thus, the objective of this study was to describe the current scenario of CAP training in Brazil, Argentina, Uruguay, and Chile regarding the number of CAP residency training programs, curriculum and recruitment of new child and adolescent psychiatrists. With these data, we aim to promote the information exchange between the CAP centers and to strengthen the child and adolescent psychiatry field in South America.

Methods

Participants

We identified and contacted all CAP programs with residency training programs in Brazil, Argentina, Uruguay, and Chile. In Brazil, there are 23 centers accredited by the National Council of Medical Residency (CNRM) of the Ministry of Education (MEC). There are nine centers in Argentina accredited by Comisión Nacional de Evaluación y Acreditación Universitaria (CONEAU), nine centers in Chile, and two centers for training with a common program in Uruguay.

Procedures

The coordinator of each residency training program was contacted by one of the authors to explain the purposes of the study, the questionnaire, and to obtain consent to report the results. The residency program coordinator was asked

to complete the questionnaire in conjunction with a resident or former resident via RedCap platform. The answers were checked for accuracy prior to the data analysis.

Measure

The questionnaire was adapted from the one used in the ESCAP 2019 survey [12] and included: (1) general information about the country, such as number of inhabitants, population with less than 20 years of age, number of CAP residency training programs and number of CAP; (2) undergraduate exposure to CAP; (3) whether CAP was a specialty or subspecialty, and the existence of a national curriculum and certification; (4) recruitment process and duration of training; (5) characteristics of the residency training program (date of the beginning of the residency program, positions offered each year, number of current residents, number of dropouts in the last 5 years, specialization courses offered in the area, the structure of services, theoretical and practical training program, skills and competencies requirements, supervision and assessments during training); (6) information about the faculty in the CAP training programs; (7) employment perspectives in the area. It was also possible to inform details about the structure of training program in a descriptive answer. The final adapted version of the questionnaire had 83 questions.

Analysis

Descriptive analysis of quantitative data was performed. The descriptive answers, with details about the curriculum of residency training program, the functioning of the service, and assessment strategies, were analyzed and grouped according to their content—this process was reviewed to assure group reliability. Qualitative results were used to add information and better understand the quantitative data. The SPSS program version 23-2016 was used to analyze the data.

Results

Of the 23 Brazilian CAP residency training programs registered in the Ministry of Education, 12 completed the questionnaire (10 fully and 2 partially completed). All training programs are affiliated to universities. There are 68 training positions in these programs, and 66 are currently occupied. Three programs from Chile, two from Argentina, and one from Uruguay completed the questionnaires. These six programs currently offer 37 fully occupied training positions (Table 1).

Table 1 Residency training programs in South America—distribution

	Population below age 18	Number of CA psychiatrists	Number of CAP training programs	Number of places
Brazil	61,000,000	468	23	68
North		9	0	0
Northeast		49	4	8
Midwest		54	2	3
Southeast		235	12	41
South		123	5	16
Argentina	12,000,000	500	9	NA
Chile	4,973,277	356	9	NA
Uruguay	1,000,000	80	2	NA

Number of CAPs and residency training programs

In May 2019, the Brazilian Federal Medical Council was consulted regarding the number of child and adolescent psychiatrists registered. There were 516 child and adolescent psychiatrists registered, but 35 were excluded (canceled or transferred), totalizing 481 valid state registers. Of these, 13 professionals work simultaneously in more than one state, resulting in 468 registered CAPs (10.4% in the Northeast, 11.5% in the Midwest, 50% in the Southeast, and 26.7% in the South). Distribution of accredited CAP residency training programs follows the same pattern: none in the North, 4 (16%) in the Northeast, 2 (8%) in the Midwest, 12 (54%) in the Southeast, and 5 (21%) in the South. The North region does not have any training program in CAP and only nine child and adolescent psychiatrists working in the region.

While in Chile, Uruguay, and Argentina CAP is an independent specialty, in Brazil it is considered a subspecialty of Psychiatry. After graduating from medical school, it is necessary to attend 3 years of General Psychiatry before entering the additional year of CAP training. There are no national guidelines for CAP residency training programs in Brazil.

In Chile, CAP has been an independent specialty since 1980 and the access to the CAP residency training is direct after the end of the medical school. There are eight training programs that offer a 3-year training and there is a ninth newer program in the Universidad de la Frontera, in Temuco, in the south of the country, that is expected to fulfill its third year in early 2021. There is not a unified national program, but there is a minimum curriculum to be developed in 3 years. In Argentina, there are nine CAP training programs. In Uruguay, there are two CAP programs. The two programs have the same training program, lasting 4 years and with unified theoretical courses.

In the last 10 years, 311 trainees completed their CAP residency in Brazilian programs and 93 in the other countries.

However, nine trainees gave up before finishing their residency in Brazil and two in Chile and Argentina.

Exposure to CAP during medical school, recruitment and training programs characteristics

In Brazil, only five programs have regular activities for medical students, varying from theoretical classes to observation of clinical appointments at the outpatient units. Students interested in CAP can participate in research projects and academic activities. Regarding the selection of candidates to residency, it is performed by each residency program, following local criteria (written exam about child and adolescent psychiatry, curriculum analysis and interview). The curriculum analysis evaluates the institution of Medical graduation, the institution where the residency of General Psychiatry was concluded and academic performance; scientific production, participation in courses and congresses, volunteer activities and knowledge of other languages. There is also an interview with the candidate to clarify any issue about the curriculum, evaluate interest and professional attitude. Only one program performs an assessment of clinical skills (case discussion) as part of the selection process. In Argentina, the selection process is similar to that of Brazil, performed by each residency program. By contrast, in Uruguay and Chile, the selection is made at national level, and in Chile it consists of two stages—first phase of the selection is national, conducted by the Ministry of Health based on the candidates working and academic information, and then the candidates selected for the second phase are interviewed by the faculty members of each of the programs to check their qualification for the specialty.

In Brazil, the minimum workload of the residency program in child and adolescent psychiatry is 2,880 h, to be held over a period of 1 year: of these, 10–20% should be in theoretical activities and 80–90% in clinical activities. All Brazilian residency training programs offer theoretical classes, and attendance is mandatory in all but one of them. The course content to be taught are usually the same throughout the country, but the way they are taught and the hours allocated to each are quite different. The theoretical knowledge generally includes: evidence based medical skills, child development, epidemiology and etiology of mental disorders, assessment according standardized diagnostic criteria, course and prognosis of disorders, emergency child psychiatry, and treatment. In Brazil, practical activities occur mostly in outpatient clinics that are opened for various age groups and different diagnoses. Nine programs provide experience in an inpatient unit, with variable duration—from 2 h/week to 6 months long. Only one program includes training in child neurology and consultation for children hospitalized due to other medical conditions.

In Chile, the training has a duration of 3 years. In the first year, trainees develop practical activities in the CAP service. In the second year, they spend 8 months in adult psychiatry (4 months in an inpatient care unit and 4 months in outpatient clinics) and 4 months in child neurology. In the third year they return to clinical practice in the CAP service. In Argentina, the programs can have durations of 3 or 4 years and include training in pediatrics for 6 months and child neurology as an optional internship for 3 months.

The clinical skills training is focused on developing skills on interviewing, examining, and treatment. Management, leadership, and teaching skills were much less emphasized—only three programs described these specific topics to be taught. Trainees were required to observe senior colleagues' clinical skills in all programs.

Only eight centers that participated in the research specified which type of psychotherapy is taught in the training of the residents, with predominance of cognitive behavioral therapy (CBT), family-based systemic therapy and parental training. In none of the programs, there is a minimum number of patients or a specific diagnosis to be followed.

Research projects with presentation and/or publication is not required as part of the training in 44% of the programs (8 out of 18 programs that gave this information), despite being encouraged during and after the residency period. The universities usually offer postgraduate opportunities after completion of the CAP training.

Trainees are strongly encouraged to attend national and international conferences and to spend training time in other programs and countries, but with little or no financial coverage. Some of the programs have research funding that is offered to the trainee when he/she has a poster or an oral presentation accepted at a conference. Although supplementary CAP training abroad is recommended, there is also no specific financial support for it. The CAP program at the Department of Psychiatry at the University of São Paulo is an exception: the program has been offering a 3-month internship at Yale Child Study Program for up to 2 residents per year with covered costs since 2014, and 13 residents have already benefited from the program.

There are no specific supervision guidelines in Brazil, but they are usually conducted face to face, individually and full time during clinical activities. Each clinical case is evaluated by the trainee and discussed with a supervisor, with attention to the ability to perform a clinical examination, differential diagnosis and therapeutic plan. Discussions are based on the balance between appropriate clinical evidence and the supervisor's clinical experience. In Uruguay, Argentina, and Chile, the supervision of trainees varies according to the training program, but is usually done individually and daily. Gesell chambers or one-way screens are frequently used in these countries.

Follow-up evaluation—assessment of trainees

In Brazil, there are no national guidelines for the follow-up assessment of trainees. Each residency program has autonomy to carry out its own evaluation system, which varies widely among the different programs. Exposition and performance during seminars, elaboration and discussion in clinical case sessions, and the competencies demonstrated during clinical case discussions with the supervisors are some of the ways by which trainees are routinely evaluated. In three programs (25%), there are formal assessments of skills and abilities every 2 or 3 months. In these individual assessments, trainees receive feedback from the supervisors and the residency programs coordinator about ethical behavior, doctor-patient relationship, abilities to work in a multi-specialty team, knowledge, application of knowledge in clinical settings, conflict mediation skills in more complex clinical conditions, planning capacity for therapeutic interventions, among other aspects. It is also an opportunity for trainees to evaluate the program and make suggestions to improve the activities.

Four programs (out of 18 respondents) do not perform a formal final exam, using these periodic assessments to evaluate and estimate the skills needed to complete the specialty training. An exam and a clinical case discussion are conducted at the end of the training in 13 of the 18 programs, and a final paper is required in 2 programs. In Chile, the evaluation of trainees takes place at the end of each semester, during the 3 years of training, with practical and theoretical exams. Some of the pedagogical features of the training centers accessed by this research are presented in Table 2.

In Brazil, to be recognized as a child and adolescent psychiatrist, it is mandatory to complete a CAP residency training program, but there is also the possibility to be certified by the Brazilian Psychiatric Association (ABP). In the last case, it is necessary first to be certified as a specialist in General Psychiatry by ABP, then to prove more than 5 years of practice in Child and Adolescent Psychiatry, and finally, to be approved in the exam to obtain the certificate in CAP held by the ABP. Similarly, in Argentina, title of specialist is issued by the Ministry of Health and the certificate by the Argentine Association of Child Psychiatry. In Chile, the title is issued by the universities or the National Commission for the Accreditation of Medical Specialties. In Uruguay, the specialist title is provided only by the Ministry of Health. In all countries, the title of specialist can be obtained after completing the residency training program or by approval in the exam held by the country's association or commission.

Organization of the training programs

In Brazil, to accredit the residency training program and to adjust the number of training positions offered in each program, the National Medical Residency Council (CNRM) evaluates the following items: program coordinator (time of practicing in the specialty, qualification, weekly workload for the program), faculty members (number, training of professionals, presence of chief resident, scientific production, hours dedicated to the residency training program), pedagogical program (availability of training in inpatient, outpatient, other rotations), assessment tools (both for trainees follow-up and the training program). To match the number of positions, the ratio of residents to supervisors (ideally, 3:1 at most) should be respected.

In Chile, the accreditation agency has specific standards to be met to recognize a CAP training program: it is necessary to have a professor of CAP with dedication to the university, faculty members with a specialist degree (hired by the university or volunteer) with availability to dedicate 2 h daily for each resident, a multidisciplinary team (psychologist, occupational therapist, social support), and minimal physical structure (to observe medical care, internet access, library).

In Brazil, the funding for trainees comes from different sources in each program, but they are mostly provided by the Ministry of Education and each State Health Department. The average trainee's income is around US$ 80,000 per month. In Uruguay, the Ministry of Health is responsible for funding and the trainee income is around US$ 75,000 to 95,000 per month. In Argentina, there is no contribution by the government, making costs either the responsibility of students or of the hospital where they carry out their training. In Chile, there are also different sources of funding and can be paid by the government (around US$ 1.00000 per month), by the trainee or by the university.

In Brazil, in seven out of ten programs the CAP coordinator holds a PhD degree, while in the other three, they hold a MSc. Only four of ten coordinators are registered as Child and Adolescent Psychiatrists in the Brazilian Association of Psychiatry (ABP). In Uruguay, the coordinator has a PhD degree and is not registered in the national association of Child and Adolescent Psychiatrists, while in Argentina in the two programs the coordinators have a MSc degree and are registered in their national association. In Chile, they have one program with the coordinator with a PhD and another with MD degree.

In Brazil, requirements for being a senior clinician that supervises trainees are heterogeneous and specific for each program: in some it is necessary to have a post-graduation degree; in others it is necessary to be part of the clinical staff of the university hospital; while in another, many of the seniors are composed by volunteers. Almost half of the programs do not require the participation of the senior clinician in continuous educational courses related to training. Despite the heterogeneity, in only two programs it is not required that senior clinicians have paid working time.

Table 2 Residency training programs in South America—program activities

	Brazil	Uruguay	Chile	Argentina
Complete questionnaire	10	1	2	1
Incomplete questionnaire	2	0	1	1
Unified national curriculum	No	Yes	Yes	No
Status of cap	Subspecialty of psychiatry	Separate specialty	Separate specialty	Separate specialty
Minimum length of training time to qualify as cap after qualifying as a medical doctor (years)	4	4	3	3
Organization of the recruitment process	Local (organized by hospital)	National	National	Local (organized by hospital)
Theoretical training[1]: % of programs that provide formal teaching sessions; mean time spent on it (min–max)	100%; 4.8 h/week (1–12)	100%; 5 h/week	100%; 33.3 h/week (10–20)	100%; 12 h/week (8–16)
Diagnostic assessment according to ICD/DSM % of programs that cover this item of theoretical knowledge	100%	100%	100%	100%
Epidemiology and etiology of CAP disorders % of programs that cover this item of theoretical knowledge	100%	100%	100%	100%
Course and prognosis of CAP disorders % of programs that cover this item of theoretical knowledge	100%	100%	100%	100%
Pharmacological treatment % of programs that cover this item of theoretical knowledge	100%	100%	100%	100%
Practical training				
Inpatient[2] % of programs that provide inpatient experience; mean time spent on it (min–max)	81.8%; 561.1 h (40–1500)	100%; 4400 h	100%; 2133 h (400–4800)	100%; 6600 h
Outpatient[3] % of programs that provide outpatient experience; mean time spent on it (min–max)	91.6%; 801 h (240–2200)	100%; 6600 h	100%; 5066 h (3800–6600)	100%; 6600 h
Psychotherapy (individual and/or family systemic)[4] % of programs that provide training in psychotherapy; mean time spent on it (min–max)	54.5%; 149.6 h (88–176)	100%; 60 h	100%; 1760 h (1584–2112)	100%; 1056 h (792–1320)
Pediatrics[5] % of programs that provide experience in Pediatrics; mean time spent on it (min–max)	0	100%; 600 h	33.3%; 7200 h	100%; 1200 h
Neurology[6] % of programs that provide experience in Neurology; mean time spent on it (min–max)	30%; 146 h (96–200)	100%; 600 h	100%; 3733 h (800–9.600)	100%; 600 h

Table 2 (continued)

	Brazil	Uruguay	Chile	Argentina
Formative assessment				
Every 2 or 3 months[7] % of programs that conduct structured assessment	27.2%	0	100%	50%
Final written exam[8] % of programs that require written exam to complete the training	36.3%	100%	66.6%	50%
Research activities[9] % of programs that require a research project with presentation/publication	45.4%	100%	66.6%	0
Undergraduation exposure[10] % of programs in which medical students spend time in CAP	45.4%	100%	66.6%	0
Perceived variation in training	High[13]	Low[11]	Low[11]/considerable[12]	Low[11]/considerable[12]

Questions included in the survey:

[1]To support theoretical learning, do you have formal teaching sessions as part of training? If there are formal teaching sessions, how many hours per week/month?

[2]If there are specific requirements, please specify duration of time spent in outpatient experience

[3]If there are specific requirements, please specify duration of time spent in inpatient experience

[4]If there are specific requirements, please specify duration of time spent in psychotherapy

[5]How much training time is spent in Pediatrics?

[6]How much training time is spent in Neurology?

[7]For trainees, is there structured assessment of training?

[8]Is formal examination (written exam) required during training?

[9]Is a research project with presentation/publication part of the training?

[10]Do all medical students spend time in child and adolescent psychiatry clinics?

In response to the question: overall, how would you rate the variation of training experiences within your country?

[11]Low: there is a national curriculum and training guidelines and their implementation is closely monitored. Apart from some variation in supervisors and slight differences in expertise of different care environments, the training is very similar for all

[12]Considerable: although there is a national curriculum and national training guidelines their implementation is not monitored and trainees might have very different experiences depending of where they train

[13]High: there is very little available in terms of national training guidelines and national curriculum. Training is organized locally or regionally and it was barely possible to answer the questions in this questionnaire reliably for all trainees in the country

In Uruguay, Chile, and Argentina it is mandatory to have a nationally recognized CAP qualification, and in Chile and Uruguay it is also needed to be a faculty member (formal link with university) to supervise the trainees. Besides, in all three countries it is at least recommended to participate in continuous professional education related to training, and to be paid for the supervision working time. Some features of the organization of training programs accessed by this research are presented in Table 3.

In Brazil, in all but two programs the quality of the training is monitored regularly by the trainee's perception (varying mostly between 3 and 6 months), either by anonymous questionnaires and also through the trainee's personal feedback to the program coordinator. In Argentina, annual questionnaires are answered by the trainees to evaluate the quality of the training and in Chile written evaluations are also done. In Uruguay, the trainees evaluate the supervisors, but this is not carried out systematically.

Employment after training

In Brazil, considering the shortage of qualified CAP to meet the population demands, it is not difficult for the new CAP to find a paid job in the public sector at the end of training. It is common that those specialists also offer private consultations with or without the coverage of health insurance companies. In the three other South American countries accessed in this study, it is also common that CAP specialists find jobs after finishing the CAP residency, although in Argentina they tend to be poorly remunerated by the public

Table 3 Residency training programs in South America—organization of the programs

	Brazil	Uruguay	Chile	Argentina
Accreditation	National Medical Residency Council (Ministry of Education)	Yes	Yes	National Commission of University Education (Ministry of Health
Funding for trainees US$ per month; source of funding	800.00; Ministry of Education	750.00–950.00; Ministry of Health	1,000.00; Government or university	No contribution by the government
Program coordinator degree				
PhD % of program coordinators with this degree	66.6%	100%	33.3%	50%
MD % of program coordinators with this degree	0	0	33.3%	50%
MSc % of program coordinators with this degree	33.3%	0	0	0
Registration as CAP % of program coordinators registered as CAP in the Association of Psychiatry or Association of Child and Adolescent Psychiatrists of the country	25%	0	66.6%	50%
Certificate of cap				
Completed CAP residency training program	Yes	Yes	Yes	Yes
National specialist register	Yes; by the Brazilian Psychiatric Association	No	Yes; by the National Commission for the Accreditation of Medical Specialties	Yes; by the Argentina Association of Child Psychiatry
Requirements to qualify as a specialist by the residency training program				
Written exam % of programs	41.6%	100%	33.3%	50%
Oral exam % of programs	0	100%	100%	50%
Clinical exam % of programs	16.6%	100%	66.6%	0
No formal exam but structured assessments % of programs	33.3%	0	0	0

sector. Therefore, very frequently new psychiatrists end up working in the private practice sector.

Perceived variation in training

In Brazil, there is a consensus from the coordinators of CAP training programs about the high variation in training programs. Although institutions are guided by similar principles with regard to the content of topics to be addressed and the distribution of time devoted to theoretical and practical learning, there is no national curriculum or training guidelines. Each program has autonomy to organize its own program, which reflects in great heterogeneity. Besides, in Brazil CAP is considered a subspecialty of psychiatry, not yet recognized as a specialty, which contributes to lack of mobilization towards the creation of a national curriculum.

In Argentina, there is no national curriculum either. The residency programs were developed in the 80s, aiming to train university specialists and, in this scenario, there is still no national consensus on curriculum. In Uruguay the situation is quite different since the only two CAP training programs share the same training program, organized by university professors that are specialists in CAP. In Chile, there is no unified national curriculum, but there is a minimum program to guide the activities to be developed during training and therefore the programs are more homogeneous.

Discussion

To the best of our knowledge, this is the first study aiming to evaluate the current scenario of CAP training in South America. The results pointed out the potentialities of the residency training programs in CAP but also the aspects that need to be improved both in programs as well as in residency training centers.

Overall, there is a great variability among South American CAP residency training programs. Uruguay is a small country of only 3.5 million inhabitants and until 15 years ago there was only one Faculty of Medicine with a single training program for specialists, located in Montevideo. Eight years ago, another training program was accredited by the graduate school. The two CAP training programs have a unified selective process and a national curriculum for CAP training. The history of Argentinian CAP is marked by the influence of psychoanalysis and, due to that, there was a mixture of roles between psychiatry and psychoanalysis in the 1960s and 1970s. This context has made it difficult to draw up a national curriculum so far. In Brazil, there is still a challenge regarding the development of national guidelines. Potential explanations to the heterogeneity of CAP programs in Brazil are the continental dimensions of the country, with important cultural and socio-economic heterogeneity, as well as the status of CAP of a subspecialty.

In Brazil, there were 15 CAP registered training programs in 2008 and this number has increased to 23 currently, with 66 occupied positions out of 68 available. Considering the programs that answered the questionnaire, 311 CAP residents have completed their training in the last 10 years. This scenario is the opposite of that in the USA, where 37% of CAP residency training programs had vacant positions and the interest for CAP dropped from 67 to 55% from 2008 to 2017 [23]. Between 2006 and 2007, there were 107 officially certified CAPs in Brazil; comparing with data obtained between 2018 and 2019, there was a 284% increase, but there is a concentration of CAP training programs in the country's South and Southeast, which are the richest regions.

The number of residents completing their training in Chile has also increased in the last 20 years, with the opening of new programs at different universities. Until the early 1990s, Universidad de Chile had the only training program and between five and eight new CAP every year completed their training. Nowadays, we estimate that around 24 new CAPs complete their training every year in the eight residency programs that are currently with the complete training program. This number will also increase in the coming years, when a more recent program from Universidad de la Frontera will fulfill the three years training program. In Uruguay, there is a range of CAP professionals that have not been certified, probably because the Ministry of Health does not require this to allow the clinical practice of the specialty. Among ten residents who begin training, approximately two or three do not complete it. In Argentina, 136 CAPs are officially certificated by the National Ministry of Health, 92 of them registered between 2009 and 2019.

Despite the increasing number of CAP training programs in South America, there is a significant lack of CAP services and specialists. Possible reasons for this are lack of knowledge, poor advocacy, lack of training and skilled professionals, and lack of financial and personal resources for training programs and services development and implementation [10]. According to the WHO [10], continued neglect of the mental health needs of children and adolescents is unacceptable, and, to change this panorama, professionals must receive adequate training. Currently, child and adolescent psychiatrists are seeing increasingly severely ill children and families who are in need of complex approaches that should be delivered by multiple professionals.

With the intention of increasing the number of professionals able to treat children with mental disorders, there are proposals of training programs for pediatricians, general psychiatrists, and family doctors [24]. In Brazil, there is only one CAP training program that offers a specialization course for other medical specialties [25]. Despite the need for offering quality education to professionals who are already treating children and adolescents with mental health problems but did not complete the formal residency training, this issue is controversial, as it raises questions related to the required skills and knowledge for treating children and adolescents.

Exposure to CAP early in medical school is an important strategy to increase interest in the area [24]. In Brazil, as suggested by McCarthy et al. [24], classes are included in the medical curriculum, but the workload is minimal compared to other specialties. Another strategy to increase medical students' interest in CAP residence includes investing in campaigns to reduce stigma related to mental disorders and consequently, to the specialty. As proposed by Guerrero and Roberts [26] and knowing that less than 10–20% of all psychiatrists choose CAP as a subspecialty, most programs include CAP as part of general psychiatry training.

To have a global vision of the program and to monitor both the program and trainees, as well as helping to engage the resident with his/her own training and learning process, the definition of core competencies is essential. According to Dingle and Sexson [27], there are six areas of competence to be developed through training: (1) clinical science; (2) interpersonal skills and communication; (3) patient care; (4) practice-based learning and improvement; (5) professionalism and ethical behavior; (6) systems of care. All these

topics were covered in the CAP residency training programs that answered the questionnaires.

The biopsychosocial approach with attention to each phase of development best meets the particularities of mental disorders in childhood and adolescence [24]. In this sense, the trainee should invest in the ability to interpret scientific studies and in an integrative approach, including medical-, neurological-, and developmental knowledge. In all residency training programs of South America there is a clear direction to integrate knowledge from the areas of pediatrics and neurology, however, the minority of the training programs offer internship in neurology or pediatrics. CAP trainees must also learn about psychological, psychodynamic, family and behavioral factors that, together, influence the functioning of the child. To develop all those competencies, CAP's trainees have to rely on supervisors as role models. However, only in Uruguay, Chile, and Argentina the faculty must have a formal link with university; in Brazil, a great part of supervisors are volunteers, which may hinder greater dedication to teaching and compromise the role model.

Santos et al. [28] emphasize the importance of a curriculum with opportunities to develop communication and didactic skills, considering the need to interact with other professionals and to educate patients. Use of communication resources opens opportunity to establish a formal collaborative consultative network, that can be further strengthened through years of clinical practice. CAP's trainee should understand how the attendance system works, dialogue with different disciplines, but also should be encouraged to innovate and work within systems, seeking new partnerships and collaborations [24]. Rotations with a multidisciplinary team are essential for CAP to act as a consultant to other professionals and also to develop a comprehensive care system. All residency training programs have a multidisciplinary team to interact with trainees, even though internships sustainability is a great concern [29].

To summarize, the training should offer opportunities for the development of didactic, consulting and system analysis skills, maintaining a comprehensive curriculum, focusing on theories and the science of development and an understanding of the inner life of the child and family dynamics. One possible teaching strategy is to use active teaching technique: small groups, team-based learning, and advanced technological resources [30]. However, details about teaching techniques employed in the CAP residency training program are still lacking.

The major limitation of this study was the reduced number of respondents among the existing programs in the four countries. The timeframe to respond the survey (three weeks) may have been insufficient for all centers to respond satisfactorily. However, it is not possible to say if, with a longer period, we would have a higher response rate. Considering this limitation, it is not possible to guarantee that the scenario found is representative of the other existing CAP training centers and other countries. Additionally, it would be important to have information from other South American countries to have a more broad and complete scenario of the field in the region.

Despite these limitations, this is the first survey in South America on CAP residency training programs and the information gathered is relevant and can contribute to the promotion of experience exchange between the countries and the development of national guidelines for the training of CAP, as well as encouraging the approximation among those responsible for residency programs and to promote experience exchange.

In conclusion, our findings indicate that CAP is a growing field in Brazil, Argentina, Chile, and Uruguay, but significant heterogeneity exists within countries, especially in Brazil, and between countries. Overall, our results indicate a shortage of programs and specialists, with no standardized guidelines for training. In this sense, investments from governments and universities should be directed to ensure the development of existing programs and the creation of new ones. In addition, creative and innovative initiatives, which can be developed from cross-fertilization between programs in the region, and also from other regions, are necessary to overcome the existing barriers and to guarantee adequate training to the next generations of child and adolescent psychiatrists in South America.

Compliance with ethical standards

Conflict of interest On behalf of all authors, the corresponding author states that there is no conflict of interest.

Ethical approval No ethical approval was required for information collection in this study as it did not involve the collection of personal information.

Informed consent This work did not require a consent form nor used patients or individuals data.

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