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ORIGINAL RESEARCH

Cardio-Obstetrics Practice in Latin America

A Regional Survey of General Cardiologists

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ABSTRACT

BACKGROUND Cardiovascular (CV) disease is a leading cause of death in pregnant women globally, especially in low- and middle-income countries including Latin America (LATAM), where there is lack of data on how cardiologists are trained in cardio-obstetrics (CO) and the practice patterns in the care of pregnant patients.

OBJECTIVES The authors aimed to identify CO competency and practice patterns among LATAM general cardiologists.

METHODS An anonymous cross-sectional Google-based electronic survey was sent via email to clinical cardiologists through local American College of Cardiology chapters and CV societies. Demographics, prior CO training, and practice patterns related to pregnant patients with CV disease were assessed.

RESULTS A total of 464 participants responded: 53% male, 52.5% from Central America and the Caribbean, 36.5% from South America, and 11% from Mexico. Most (67%) had not received didactic education in CO during fellowship; the majority expressed interest in participation in educational activities on this field, and only 18% reported practicing in centers equipped with CO teams or experts. Specific characteristics of CO practices in the region are shown in the figures.

CONCLUSIONS Based on this survey, the CV care and follow-up of pregnant patients in LATAM is suboptimal; most cardiologists report lack of CO formal education during training and feel uncomfortable providing care during pregnancy although expressed interest in enhancing their knowledge in this field. (JACC Adv. 2024;■:101295)

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ABBREVIATIONS AND ACRONYMS

CO = cardio-obstetrics

CV = cardiovascular

CVD = cardiovascular disease

LATAM = Latin America

LMIC = low- and middle-income country

REBECGA = Brazilian Registry of Pregnancy and Heart Disease

Cardiovascular disease (CVD) remains a major cause of death among pregnant women worldwide, particularly in low- and middle-income countries (LMICs) where limited resources and social determinants of health play a critical role in disease expression.[1-6] While the risk imposed by CVD upon childbearing women expands beyond pregnancy and the postpartum period to reach midlife, most adverse events are preventable by increasing awareness, implementing preventive measures, and early therapeutic interventions.[7,8]

Latin America (LATAM), defined as a region in the Americas where Romance and Latin-derived languages such as Spanish, Portuguese, and French are predominantly spoken, is conformed of 20 countries stretching from Mexico, Central America, and the Caribbean to Chile, its southernmost territory. Compared with North America or Europe, LATAM nations have younger populations, higher fertility rates, and most are categorized as LMICs with marked socioeconomic disparities.[9,10]

Racial, cultural, and language differences; limited access to health care, as well as a high prevalence of CV risk factors brought upon by the epidemiological transition of agricultural to service economies, have led to epidemic levels of CVD in the region. As such, hypertensive disorders, valvular disease, heart failure, and adult congenital heart disease remain important causes of morbidity and mortality during pregnancy, responsible for maternal death rates as high as 26%. In fact, among the top 8 countries in the world with the highest hypertension-related maternal deaths, 5 are in LATAM.[2] Adolescent pregnancy is an additional burden that makes young patients even more vulnerable; reported rates in LATAM are the second highest in the world, with 15% of all pregnancies occurring in women under 20 years of age.[11,12]

Aside from Mexico, Argentina, Colombia, and Brazil, some of LATAM's largest countries where a strong infrastructure of cardio-obstetrics (CO) care is developing in major urban areas, there is a paucity of data regarding the providers caring for pregnant patients and in which settings that occurs in this highly populated area; what gaps remain in the education and training of cardiologists in this field, and what policies and interventions are required to improve care.[13] In this survey, we aimed to identify CO competency among LATAM general cardiologists, CO clinical practice characteristics/patterns, as well as selected features of the care received by pregnant patients with CVD.

METHODS

An anonymous Google-based cross-sectional electronic survey was sent to practicing LATAM general cardiologists through local American College of Cardiology chapters and countries' CV professional societies. Clinicians were surveyed using a nonprobability sampling technique using all voluntary responses. The study was conducted from April 9 through September 30, 2023, during which period up to 3 reminders were sent.

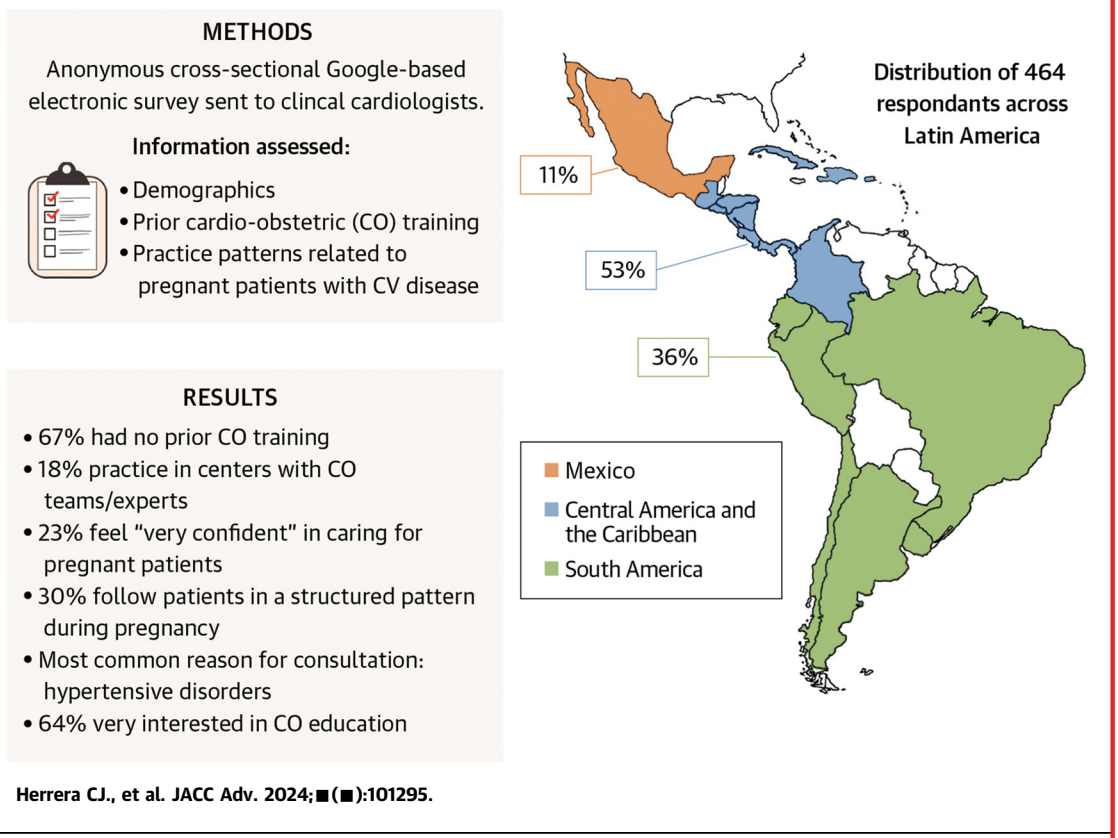
Coinvestigators (representatives from each country) randomly contacted physicians via email or instant messaging applications explaining the purpose of the study and ensuring confidentiality and anonymity of responses. Although several languages are dialects spoken in LATAM, the content of the survey was made available only in English and Spanish given the financial limitations in this effort and the fact that these are the predominant ones. It was structured by the senior authors, with some components adopted from a similar survey distributed in the United States.[14] The survey was composed of 12 closed questions that included the following: demographics (sex, geographic region of residence, number of years post training completion); clinical practice characteristics (work setting, presence of CO experts or team in their respective centers); knowledge and attitudes about the delivery of care to pregnant patients with CVD (prior training, participation in CO educational activities, and desire to enhance competency in the field); and specific practice patterns related to evaluation and follow-up of pregnant patients with CVD (see Supplemental data). The study protocol conforms to the ethical guidelines of the 1975 Declaration of Helsinki as reflected in a priori approval by the institution's human research committee.

For this analysis, the 17 participating countries were divided into 4 geographic regions: South America (Argentina, Brazil, Ecuador, Chile, Colombia, Peru, and Uruguay); Mexico; and Central America, and the Caribbean (Costa Rica, Cuba, Dominican Republic, El Salvador, Guatemala, Honduras, Nicaragua, Panama, and Puerto Rico). Statistical analyses were performed using Stata 17 software (Stata Corp).

RESULTS

A total of 696 cardiologists received the survey, 464 completed it in its entirety, for a response rate of 66%; 244 (53%) self-identified as male, 53% were from Central America and the Caribbean, 36% from South

CENTRAL ILLUSTRATION **Distribution of 464 Respondents Across Latin America**



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CV = cardiovascular.

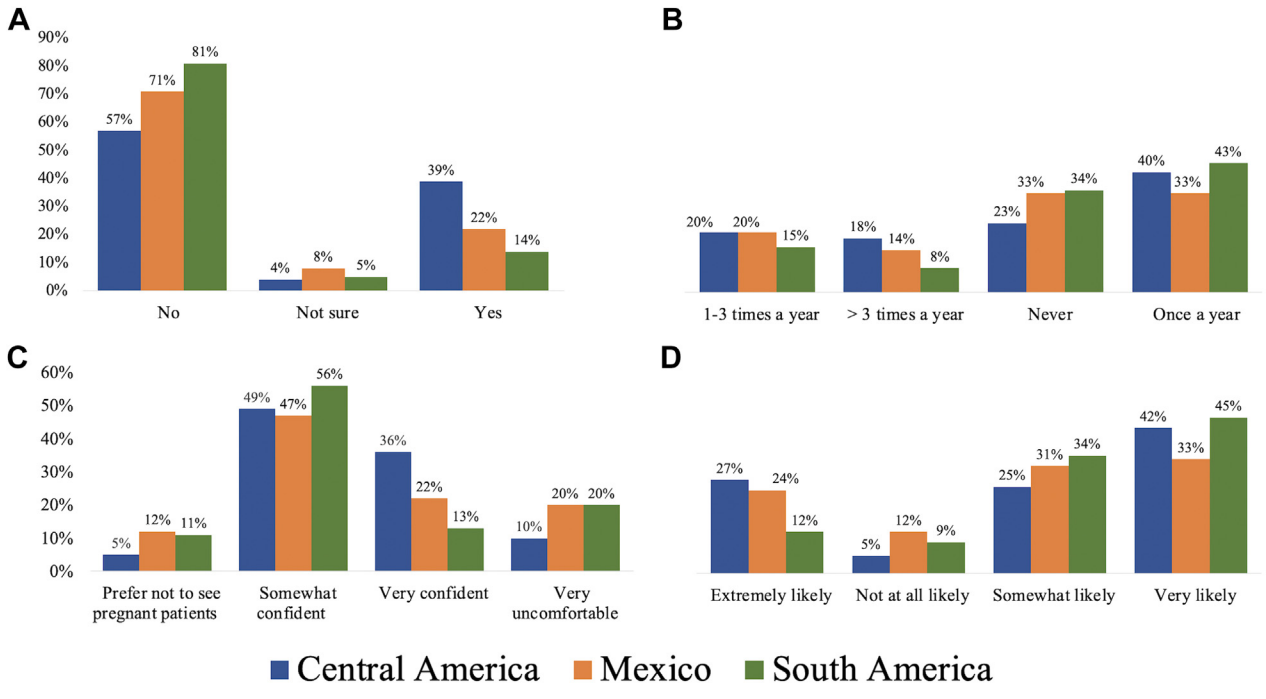
America, and 11% from Mexico (Central Illustration). Almost half of the respondents worked in a private practice setting (49%), followed by academic institutions (26%) or public-governmental hospitals (25%). Thirty-seven percent had practiced ≥20 years, 11% for 16 to 20 years, 29% for 6 to 15 years, and 23% for ≤5 years. Very few participants (5.2%) indicated they did not provide care for pregnant patients at all.

Figures 1 and 2 depict physicians' education and practice-related characteristics. In 73% of cases, hypertensive disorders were the most common reason for cardiologists' consultation during pregnancy; other less common requests included the coexistence of congenital heart disease (9%), valvular heart disease (7%), heart failure, and cardiomyopathies (5%), among others (6%). Obstetricians (79%) were the most frequent patient referral source.

Among respondents, half reported evaluating pregnant patients "whenever needed or requested" and not in a structured pattern; fewer than one-third indicated they provide follow-up care in a structured pattern, whereas 6% did so only once during gestation. When queried about comfort level managing CVD in pregnancy, 54% expressed "feeling somewhat confident"; 23% stated "feeling very confident," whereas 8% answered they preferred not to see pregnant patients at all.

The survey revealed that only 18% of cardiologists in LATAM practice in a center with a dedicated CO team or expert, slightly more likely in Central America and the Caribbean. Among respondents, 67% had not received formal CO education during the fellowship, and fewer than one-third had not read or participated in CO didactic activities in the recent past. When time was devoted to these learning activities, most (40%) did so once a year, although the majority (64%) expressed being very/extremely interested in educating on the topic. No significant differences in responses to individual questions were noted across the 3 geographical subregions.

FIGURE 1 Physicians' Education



(A) Did you receive formal didactic education in CO during fellowship? (B) How often do you read or participate in CO educational activities? (C) How comfortable do you feel treating pregnant patients with CVD? (D) How likely are you to participate in educational activities in the field of CO? CO = cardio-obstetrics; CVD = cardiovascular diseases.

DISCUSSION

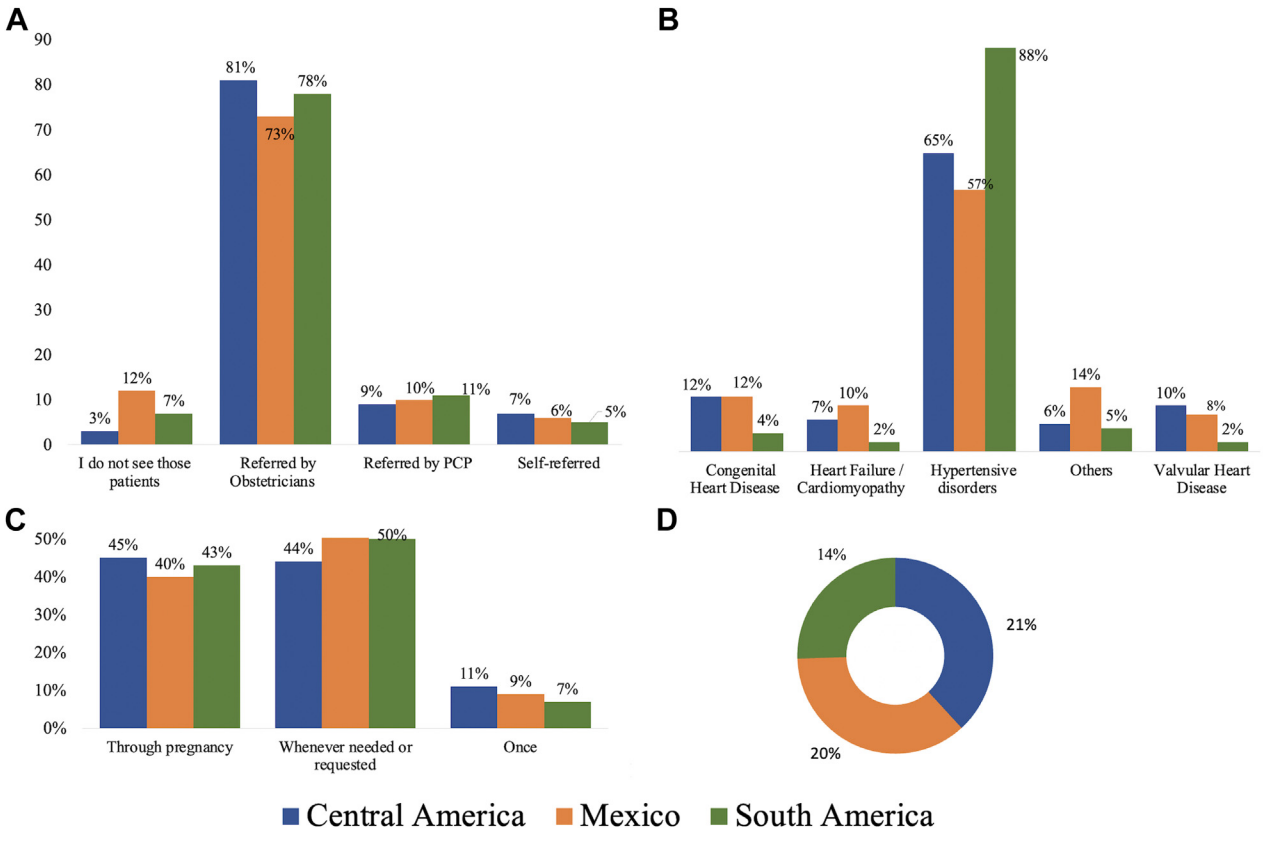
To our knowledge, this is the first study that systematically addresses cardiologists' CO competencies and practices in LMICs. The main findings are as follows: CV care of the pregnant patients in LATAM is suboptimal, and while most cardiologists lack CO didactic or clinical training and/or feel uncomfortable treating these patients, there is enthusiasm toward enhancing knowledge through educational opportunities.

Our results highlight significant system-related deficiencies in CO care throughout the region, including informal clinical follow-up practice patterns and the absence of a multidisciplinary team approach. Most cardiologists we surveyed do not receive formal education in CO, with nearly half of the respondents indicating they had been in clinical practice for ≥15 years. These findings highlight opportunities for improvement to address knowledge gaps while reexamining practice patterns to improve patients' outcomes.

In a similar survey of this nature conducted in the United States in conjunction with the American College of Cardiology, respondents indicated they had not received formal CO didactics during training, and significant gaps were noted in managing CVD during pregnancy among faculty, fellows in training, and CV team members. The widest knowledge gaps on the care of pregnant compared with nonpregnant patients were reported for medication safety, acute coronary syndromes, aortopathies, and valvular heart disease (30%). Most respondents (76%) lacked access to a dedicated CO team, and only 29% of practicing cardiologists received CO didactics during training. These findings subsequently led to an expert panel providing recommendations for training requirements for fellows in training in the United States.[14,15]

Other efforts toward the betterment of women's CV health in the CO arena have been important undertakings embraced by professional organizations, governmental institutions, and scientists in the United States and elsewhere.[16-22] However, data

FIGURE 2 Practice-Related Items



(A) How CO patients come to your practice? (B) What is the most common reason why you are asked to see pregnant patients? (C) How often do you see pregnant patients? (D) Does your hospital or clinic have a CO expert/team? Abbreviation as in Figure 1.

addressing this matter in LATAM are scarce, although regional guidelines have begun to appear.[23-27]

It is important to emphasize that the diagnosis and treatment of CV conditions during pregnancy may be challenging to the untrained provider as they span a broad range of topics, including preconception counseling, hypertensive disorders, thromboembolic phenomena, valvular and congenital heart disease, cardiomyopathies, arrhythmias, medication safety, and labor and delivery planning, among others.[28]

A recent publication addressed the characteristics of CV training outside the United States demonstrating that most fellowship programs lack a formal curriculum and evaluation methods and that accreditation processes are quite varied.[29] As such, local and regional CV and obstetrics professional organizations could implement appropriate competencies and didactic efforts in medical schools and fellowship training programs.

Published data support that the outcomes of pregnant patients with underlying CVD can be positively impacted by prevention, early diagnosis, and intervention; hence, the dissemination of CO education among practicing physicians residing in LMICs may certainly lead to reductions in morbidity and mortality affecting this typically younger population.[2]

Given the proven success of multidisciplinary CO clinics, widespread team-based CO care initiatives should be implemented in LATAM, not only in referral tertiary-level urban centers but also in remote communities where care is even more limited.[30-32] Other likely favorable steps to be taken may include the creation of multidisciplinary multicenter

registries on peripartum cardiomyopathy, Chagas disease, hypertensive disorders, and valvular and adult congenital heart disease, among others. These databases could shed light on what local factors should be addressed and prioritized so that regional CO outcomes are improved. One such experience is currently ongoing in Brazil with the Brazilian Registry of Pregnancy and Heart Disease (REBECGA) Registry.[33]

STUDY LIMITATIONS. This survey has several limitations: its sample size may or may not be fully representative of the LATAM cardiology workforce; existing distinct differences among participating nations, including geographical and cultural variations, may influence the responses; lastly, as with any survey, potential bias could be present since respondents were likely more interested/knowledgeable in CO than nonrespondents. As such, the nature of existing gaps in the education and training of cardiologists in CO and the design and implementation of policies and interventions aimed at improving care in LMICs deserve further study.

CONCLUSIONS

Despite these unavoidable methodological shortcomings, we believe that the information derived from this survey presented here should allow leaders and investigators to engage comprehensively and systematically all interested parties in the whole LATAM region so integrated initiatives in CO care can be disseminated. Fostering efforts aimed at addressing the status of this specialty, identifying knowledge gaps, and ultimately engaging policymakers is certainly an urgent and necessary undertaking.

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PERSPECTIVES

COMPETENCY IN MEDICAL KNOWLEDGE: The CV care and follow-up of pregnant patients in LMICs is suboptimal; most cardiologists lack formal didactic or clinical training in CO and feel uncomfortable treating these patients. The dissemination of CO education among practicing physicians in LMICs may lead to reductions in morbidity and mortality in this typically younger population.

TRANSLATIONAL OUTLOOK: Understanding the need to implement appropriate CO competencies and curricula in fellowship training programs and establishing multidisciplinary clinics will help improve CO care and outcomes in Latin American countries.

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KEY WORDS cardio-obstetrics, LATAM, Latin America, pregnancy

APPENDIX For Latam Cardio-Obstetrics Survey, please see the online version of this paper.