

Self-efficacy and knowledge in pediatrics among family medicine physicians in Armenia: A survey study

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ABSTRACT

Background: Armenia has trained physicians to practice family medicine (FM) for over 20 years. The pediatric population comprises a significant proportion of patients seen by FM practices, yet to date, there have been no studies assessing the knowledge and self-efficacy of FM physicians regarding pediatric care. As the first step is needs assessment to improve the quality of care, this study aims to assess the self-efficacy and knowledge of FM physicians regarding the care of pediatric patients. **Materials and Methods:** We distributed a survey to attendees at an FM conference in Lori Province, Armenia. The survey instrument assessed demographics and experience, self-efficacy in providing pediatric care, and pediatric knowledge via questions adapted from the American Board of Family Medicine (ABFM). **Results:** Eighty-seven percent of participants were female. Roughly half (45%) had trained through an FM residency program, while the remainder had retrained to become FM physicians following a residency in another field. Almost all (97%) practiced outside of the capital city, Yerevan. About half believed that their didactic (51%) and clinical education (48%) prepared them either "extremely" or "very" well. Overall, there was no clear relationship between participants' reported self-efficacy in a given area of pediatrics and their score in that area on the knowledge portion of the survey. **Conclusions:** Our findings reveal opportunities for improvement in knowledge related to pediatric care in FM physicians in Armenia, as well as a lack of relationship between reported self-efficacy and knowledge. Thus, future programs should not rely solely on self-reported gaps to identify or prioritize areas of focus. Further study is recommended in other specialties in Armenia and internationally to improve future programs.

Keywords: Capacity building, former Soviet Union, medical education, surveying

Introduction

The Republic of Armenia is a landlocked country located in the South Caucasus with a population of 3.0 million, with children (0–15 years of age) comprising 21% (21% of the

capital, Yerevan, and 22% of the provinces).^[1] Under the Soviet Union, all citizens of Armenia were provided with medical care (including primary, secondary, and tertiary care), free at the point of use, in a centralized system operating under the Semashko model.^[2,3] As with many other former Soviet republics, the healthcare system was partially privatized, and universal coverage ended following the collapse of the Soviet Union. These changes included the privatization of numerous medical facilities, the decentralization of organizational

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structure and management, and a decrease in hospital capacity.^[4,5] Armenia has been working to improve health outcomes recently towards universal health coverage.^[6] Primary care has long been established as a fundamental component of improving health outcomes. The importance of primary care has been further highlighted by global experiences with COVID^[7] and armed conflict,^[8,9] both of which are relevant to Armenia.^[10,11]

Family medicine (FM) is a relatively new medical field in Armenia. There have been two paths leading to FM certification: residency programs (currently two) for graduating medical students and an intensive retraining program (currently unavailable) for physicians who had previously trained in another specialty. Training in FM in Armenia officially commenced in 1993, though FM was not recognized as a medical specialty by law until 1995.^[12] Efforts continued to strengthen primary care, and in 1999, the first FM residency program in Armenia was established by Yerevan State Medical University (YSMU) (the program spans two years and, as of 2019, graduated 6–11 residents each year).^[13] In 2000, the Family Doctors Provision Guidelines were adopted, and finally, the Unified Curriculum for Family Medicine was established in 2002 and formally adopted by the Ministry of Health in 2003.^[12] In addition to YSMU, the National Institute of Health, which had paused its FM residency program for a short while, has since restarted it.^[13] As of 2010, 1,082 physicians in the country had trained in FM.^[14]

FM as a specialty is especially important in rural Armenia, where FM physicians are the main providers of care for children and adults. In rural areas, access to specialty care is limited due to geography and cost, healthcare utilization is lower, and significant healthcare inequities have been identified between urban and rural areas.^[4,15,16] As of 2020, 37% of Armenia's population lives in the rural setting.^[17]

Care for children in Armenia may present a challenge to medical providers not specifically trained in pediatrics.^[18,19] This is likely multifactorial, with many of the causes related to fundamental and systemwide issues in medical education,^[20] including the still-evolving system of continuing medical education.^[15] It is also possible that FM physicians who underwent retraining from other specialties may not have had sufficient exposure to pediatric cases, and pediatric knowledge has anecdotally been identified as a point of weakness. However, there are no studies to date that describe the FM physician's self-efficacy and knowledge in pediatric care in Armenia.

The aim of this study was to evaluate FM physicians' reported self-efficacy and knowledge in pediatrics in order to inform the future development of training programs in Armenia, specifically for needs-based interventions to improve the quality of pediatric care. We distributed a survey to determine training status and current practice in addition to self-efficacy and knowledge in pediatric content areas through board-type questions. In summary, this study serves as the first evaluation of FM pediatric

self-efficacy and knowledge in Armenia for further improvement of primary care. It can guide similar research efforts for additional specialties in Armenia and other countries.

Materials and Methods

Design and setting

This was an anonymous self-administered survey study developed based on Bandura's self-efficacy theoretical framework. No personal identifiers were collected. The survey instrument was developed by the study team and reviewed by experts in FM in the United States and Armenia. It was created in English and subsequently translated to Armenian by a professional medical translator and reviewed by an FM physician and pediatrician in Armenia. The survey was reviewed by a select group of ten FM physicians in the United States and Armenia (the survey instrument is described in more detail below). The study took place in the Republic of Armenia. Armenian is the state language of the Republic of Armenia.^[21]

Selection and description of participants

The survey was offered to a convenience sample of FM physicians who were present at an annual FM conference in Debet, Lori Province, the Republic of Armenia, in November 2019. Completion of the survey implied consent to participate. No personal identifiers were collected. Participation was voluntary, and the survey was anonymous and self-administered.

Survey instrument

The survey had three sections. The first part collected information on demographics and experience. The second part (self-efficacy) asked the participants on a scale from 0 (cannot do at all) to 100 (highly certain can do) their degree of self-efficacy in taking care of patients in eight categories of combined gender and age: 0–2 years old, female; 0–2 years old, male; 3–17 years old, female; 3–17 years old, male; 18–64 years old, female; 18–64 years old, male; 65+ years old, female; 65+ years old, male. Participants were asked to rate their self-efficacy in diagnosing and treating pediatric patients (0–17 years old) in 19 different instances. Each question (total of 30) was categorized into one or more of the following medical areas: cardiovascular, childhood development, dermatology, emergency, endocrine, ear, nose and throat, general, gastrointestinal, hematologic, infectious diseases, neurology, ophthalmology, orthopedics, pulmonology, and urology. The third part (knowledge) of the survey tested participants' knowledge of pediatric practice in the same categories using a multiple-choice format. Questions were obtained and minimally adapted with permission from the American Board of Family Medicine (ABFM) question bank.

For the third part of the survey, we reviewed three years of ABFM in-service exams and selected diverse questions that were country-appropriate and pediatric-specific. Country appropriateness was further evaluated by reviewing all questions with an FM physician and a pediatrician from Armenia, especially

to determine whether questions were in scope for FM in the country (as per the country curriculum guidelines as well as an FM educator) or involved tests, treatments, or immunization schedules not used in the country. If appropriateness was unclear, we consulted with three additional physicians from Armenia; one FM physician and one pediatrician had extensive experience in medical education and training in the country. We also reviewed the topics of the questions to ensure that they were within the scope for FM physicians in Armenia based on the country's Unified Family Medicine Curriculum. Approximately 30 questions were chosen, three of which had changes made to either the question stem or answers. Adjustments were either minor (e.g., answer A was switched with answer D; medication name was changed to local name or generalized to its class; "early intervention" was edited to "further evaluation and treatment") or major (e.g., medication option was removed; the question itself adjusted; "heliox" was changed to "oxygen").

Ethics

This study was deemed exempt by the Institutional Review Board of Cambridge Health Alliance (no reference number provided) and approved by the Ethics Committee of Yerevan State Medical University after Mkhitar Heratsi (no. 2-6/19). The requirement for documentation of informed consent was waived by both committees. Completion of the survey implied consent to participate. This study was completed in accordance with the Declaration of Helsinki.

Data analysis

Frequencies were calculated for categorical data. Means and standard deviations were calculated for continuous data. For the second part of the survey specifically, a self-efficacy score was calculated by averaging across all the items to yield a total score or across each area to yield area-specific self-efficacy scores. For the third part of the survey specifically, percent correct was calculated by averaging across all the items to yield a total score or across each area to yield area-specific percent correct. Correlations or Chi-squares were calculated to explore associations. All analyses were performed using SAS software (JMP Pro version 15.1, SAS Institute Inc., Cary, NC, USA).

Results

Seventy individuals attended the conference, including non-FM physicians and nurses. Of the 44 individuals who submitted a survey response, 31 responses (70%) were deemed appropriate for inclusion in data analysis (the rest were minimally completed). Among the 31 survey participants, 87% were female, and 87% graduated from YSMU. Of all participants, 45% participated in an FM residency, and 55% underwent an FM-specific retraining program following another residency. As shown in Table 1, participants in residency were younger (36.4 vs. 55.1 years), had fewer years since medical school (11.1 vs. 27.5 years), and had been working fewer years as an FM physician (6.5 vs.

Table 1: Participant characteristics of a survey assessing self-efficacy and knowledge of family medicine physicians (Debet, Lori Province, Republic of Armenia, 2019)

Demographic	Training Group	
	Residency	Retraining
Gender		
Female		
Count	13	14
Male		
Count	1	3
Age (yr)		
Mean	36.4	55.1
SD	10.4	8.3
Time since Medical School Completion (yr)		
Mean	11.1	27.5
SD	10.8	10.3
Time Working as Family Medicine Physician (yr)		
Mean	6.5	13.0
SD	6.5	3.7
Practice		
Size of Patient Population		
Mean	1925.8	2211.8
SD	949.6	798.5
Pediatric Patients (%)		
Mean	60.7	64.2
SD	16.4	16.5
Nurse Co-Workers (no)		
Mean	3.9	3.9
SD	3.9	2.5

yr=year, SD=standard deviation, FM=family medicine, no=number (count)

13.0 years) ($P < 0.003$). The two training groups did not have a different practice pattern ($P > 0.3$). Participants practiced in the following provinces of Armenia: Lori (29%), Armavir (19%), Tavush (19%), Kotayk (10%), Shirak (10%), Ararat (6%), Vayots Dzor (3%), and Yerevan (3%). None were from Aragatsotn Province, Gegharkunik Province, or Syunik Province.

The FM practitioners were asked, "How well did the didactic education you received (teaching through lectures) during family medicine training prepare you to practice as a family medicine doctor?"; 51% replied, "extremely" or "very" and the remaining 49% replied "moderately" or "slightly" (none replied "not at all"). Additionally, they were asked, "How well did the clinical experience you had (taking a history and performing a physical exam on actual patients) during your family medicine training prepare you to practice as a family medicine doctor?"; 48% responded, "extremely" or "very" and an additional 45% replied "moderately" or "slightly" (two participants did not reply to this question).

Self-efficacy

Self-efficacy in taking care of patients was scored for two categories of questions: gender and age combinations (as listed in Materials and Methods) and specific medical conditions. The gender and age self-efficacy items all showed high correlations between genders (i.e., a high correlation between FM physicians

being female and rating higher self-efficacy in caring for females and vice versa), separately for each age group ($r > 0.5$, $P < 0.01$). A principal component analysis indicated that 79% of the variance could be attributed to self-efficacy in two areas: self-efficacy in taking care of the pediatric population (the four items for individuals aged 17 and younger) and self-efficacy in taking care of individuals 18 years of age and older. Accordingly, an average self-efficacy score was calculated for these two groups. The average score for taking care of patients up to 17 years of age was 78 (range = 45–100), and the average self-efficacy for taking care of individuals who are at least 18 years old was 81 (range = 53–100). The two were moderately correlated ($r = 0.45$, $P = 0.016$).

Self-efficacy was also rated for the diagnosis and management of 15 specific general fields of pediatric medical knowledge. The median correlation between the items was $r = 0.43$ (range = -0.11 – $+0.84$). In addition to the total self-efficacy in diagnosis and treatment scores, the averages for the 15 medical areas were also calculated. For the 29 individuals who responded to these items, the average total-score self-efficacy score was 77 (range = 57–94). The “Self-Efficacy” column in Table 2 shows the total self-efficacy averages as well as self-efficacy in the 15 medical areas. Across the specific medical areas, self-efficacy scores ranged from a low of 63 in ophthalmology to a high of 85 in endocrinology.

Table 2: Pediatric knowledge and self-efficacy results of a survey assessing self-efficacy and knowledge of family medicine physicians (Debet, Lori Province, Republic of Armenia, 2019)

	Average		Correlation
	Self-Efficacy	Knowledge (%)	
Pediatric Diagnosis and Treatment	77	31	0.09
Cardiovascular	72	10	0.19
Childhood Development	81	28	0.14
Dermatology	73	35	0.00
Emergency	72	29	-0.12
Endocrine	85	29	0.12
Ear, Nose, and Throat	76	15	0.05
General	84	27	-0.07
Gastrointestinal	77	35	0.18
Hematologic	82	16	0.23
infectious diseases	79	26	0.12
Neurology	69	68	0.07
Ophthalmology	63	55	-0.04
Orthopedics	70	26	-0.03
Pulmonology	74	28	0.00
Urology	79	55	-0.22
Treating Patients 0-17 Years Old	78	–	0.22*
Treating Patients 18+ Years Old	81	–	0.16*

*Correlation between average self-efficacy for respective row and average knowledge for Pediatric Diagnosis and Treatment. Note: Average self-efficacy was scored using a scale of 0=cannot do at all, 50=moderately can do, and 100=highly certain can do. Average knowledge was scored as percentage correct. Correlation is Pearson's product-moment correlation coefficient

Knowledge

The multiple-choice questions assessed knowledge using 30 items, and these items were scored as percent correct in the specific medical areas they represented. The “Knowledge” column in Table 2 demonstrates an average percent correct of 31% (range = 10–68%).

Practitioner characteristics

There was no evidence for a relationship between the total knowledge or total self-efficacy scores and the practitioner characteristics (i.e., gender, age, years in practice, years in residency or retraining program, and practice size).

Relationship between self-efficacy and knowledge

The “correlation” column in Table 2 shows the correlation between participants’ average self-efficacy and percent-correct knowledge scores. There was no significant relationship between the total-knowledge score and self-efficacy in taking care of patients up to 17 years old ($r = 0.22$, $P = 0.25$) and likewise no relationship with self-efficacy across the diagnosis and treatment area total score ($r = 0.09$, $P = 0.61$). Table 2 also displays knowledge scores in each diagnosis and treatment area, self-efficacy scores in taking care of individuals with those conditions, and their correlation coefficients. Uniformly, there is no evidence of a relationship between self-efficacy and knowledge [Figure 1].

Discussion

Our survey is the first to formally evaluate the self-efficacy and knowledge of FM physicians in pediatric care in Armenia. Given the critical role of FM physicians in rural Armenia, the importance of primary care in improving health outcomes, and the documented need for improving medical education in

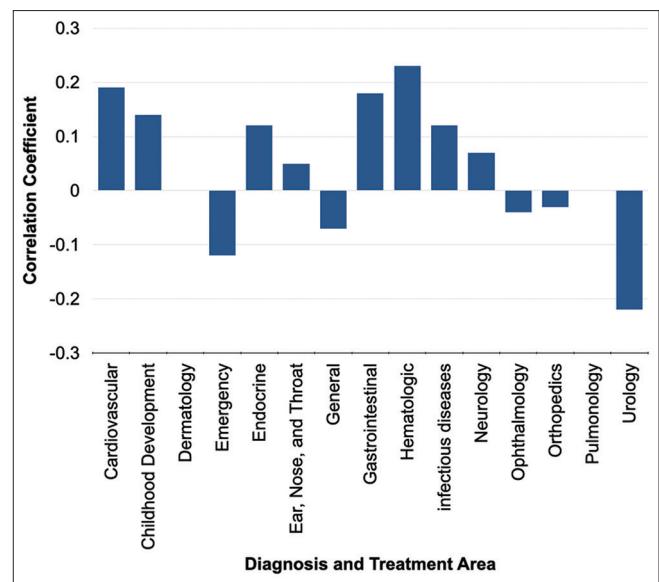


Figure 1: Pearson's product-moment correlation between average self-efficacy and knowledge scores for each pediatric diagnosis and treatment area (values listed in Table 2)

Armenia,^[18,20] it is important to understand where the greatest needs lie in primary care, including care for children. Such findings can promote the development of strategies ensuring that such interventions are adapted to provide physicians in Armenia with the quality, knowledge, and skills needed to deliver high-quality care.

A range of systemic improvements have been recommended to improve the quality of medical education in Armenia.^[20] In addition, various FM-specific strategies have been incorporated into the Armenian healthcare system. Since 2005, FM has had an overall increase in salary, though it is still generally less than the compensation of physicians in other subspecialties. Since physicians are required to pay tuition for their graduate medical education (the equivalent of residency) in Armenia, they may choose to pursue more lucrative specialties. Though training in FM is currently centered on traditional learning methods, active learning among residents in the field has been demonstrated to be a promising approach.^[13]

Our study identified areas of relative strength and weakness in pediatric knowledge. Participants, on average, scored best in the following areas: neurology (68%), ophthalmology (55%), and urology (55%). Conversely, they scored lowest in the following areas: cardiovascular (10%), ear, nose, and throat (15%), and hematologic (16%). This indicates that future educational efforts could emphasize these three areas.

Our findings indicate that there is no relationship between reported self-efficacy and knowledge. About half of the participants rated that their didactic and clinical education in FM (51% and 48%, respectively) prepared them “extremely” or “very” well, though participants scored an average of 31% on all questions pertaining to the management of pediatric patients. There was no relationship between general self-efficacy and overall knowledge score, nor was there a relationship between self-efficacy and knowledge in specific areas of pediatric care. These findings indicate that providers’ perceptions of their strengths and preparedness cannot be the sole factor in determining where knowledge gaps are, how to prioritize them, or the effectiveness of educational programs. Future interventions may need to prioritize or focus on gaps identified through other means (e.g., assessments, chart reviews, and direct observations).

Addressing pediatric care is crucial. Though non-utilization of healthcare is a driver of preventable deaths, utilization of poor-quality healthcare is an even greater burden in low-to-middle-income countries (LMICs) for the general population.^[22] In the case of Armenia (which was considered an LMIC at the time of the cited study), 53% of preventable deaths (equivalent to a loss of about 50 thousand years of life) from 1980 to 2016 were due to the use of poor-quality healthcare.^[22] A need to bridge the gap between outpatient and inpatient care for children in Armenia exists; there has been an increase in hospital admissions, but about one in three is unnecessary.^[23] Childhood illnesses include acute respiratory

infections, diarrhea, asthma, recurrent otitis, allergies, spinal curvature disorders, malnutrition, as well as other problems.^[23] High-quality care can help reduce the burden of many of the aforementioned conditions, lead to physical and emotional well-being and developmental and educational success, and pave the path toward healthy adulthood. Furthermore, proper pediatric care (or lack thereof) can impact families emotionally and financially.

Limitations

This was a self-administered survey study and subject to the biases and limitations of this study design. Due to the convenience sampling of participants, issues with generalizability are likely to be present. Furthermore, our study had a low rate for valid responses, with an estimate of ~ 70%. While the ABFM questions were validated in the United States, the translated questions were not validated in Armenian prior to this study. Furthermore, we included only a small number of questions as this survey was administered at a conference. Additionally, this study had a small sample size, with an uneven representation of the different regions of Armenia. Finally, physicians in Armenia may have relatively minimal experience with multiple-choice questions, which could have adversely affected scores (independent of medical knowledge level).

While this study was focused on the pediatric knowledge and self-efficacy of FM physicians, it is crucial to note that it is highly likely that similar knowledge gaps and discrepancies between self-efficacy and knowledge exist in other fields as well. Thus, the authors recommend that studies be conducted to better understand these patterns and improve interventions. Additionally, similar studies would ideally be conducted in other underserved areas of the world for the development efforts to be targeted based on the specific needs of the communities.

Conclusions

Our findings reveal the need to improve the pediatric knowledge of FM physicians in Armenia. Furthermore, our results indicate that the process to determine where the greatest gaps and needs lie must include more than reported perceptions, and assessments may play a significant role. FM plays an important role in addressing the rural physician shortage and thus should be focused on by relevant parties for continued development and expansion. Finally, our findings can aid in informing the development of subsequent capacity-building interventions.

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Conflicts of interest

There are no conflicts of interest.

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