Articles

Elderly care: performance of interventions carried out by More Doctors Program professionals

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In order to assess coverage and quality of elderly care, a cross-sectional study of 204 interventions of Family Health Specialization students of UFPel was conducted, both connected and not connected to the More Doctors Program (PMM). The coverage difference between the third and first months of intervention and the percentage at the end of the third month were calculated in order to obtain quality indicators. An average increase in coverage of 35.7 percentage points (pp) (32.9, 38.6) was found: 42.1 pp (38.6, 45.7) and 26.1 pp (22.3, 30) were, respectively, related and not related to PMM. Brief Multidimensional Assessment (AMR), up-to-date clinical examination and assessment of the need for dental treatment showed better results in interventions conducted by PMM professionals. The interventions were effective regardless of supply and nationality, obtaining significantly better results those conducted by PMM professionals, especially Cubans.

Keywords: Medical education. Elderly health. Primary healthcare. Family Health Strategy.

Introduction

In Brazil, the Brazilian National Health System (SUS), formalized by the 1988 Federal Constitution, is aimed at drafting and implementing the national health policy. This policy, in turn, is aimed at promoting healthy life conditions; preventing population's health risks, diseases and aggravations; and ensuring equal access to services in order to guarantee a comprehensive healthcare[1,2].

This new healthcare context of the population would require changes in education, which would need to be articulated with the concept of health and with the principles and guidelines of primary healthcare. Members of the constitutional convention attributed to SUS the responsibility for organizing the education of human resources in health[1].

The Brazilian Ministry of Health created, in 2003, the Management Department for Work and Education in Health (SGTES)[3] and, in 2004, the National Policy for Permanent Health Education (PNEPS) through Directive 198, which is specifically aimed at the education and development of SUS workers[4]. With these initiatives, the ministry showed its intention of using education and its articulation with work regulation to reorient primary care education, intensifying the integration between teaching and SUS[5].

Under the scope of SUS, since 2006, the Family Health Strategy (ESF) has been adopted as a preferential model to organize primary healthcare. The strategy identifies individual and collective demands and needs, providing a comprehensive care to all users[6,7].

The continuous expansion of primary care, in geographical terms and considering the expansion of its focus, evidenced the shortage of professionals to meet this social and political commitment[8]. As a policy to supply medical professionals, the Brazilian government instituted, in 2011, the Qualification Program for Primary Care Professionals (PROVAB)[9] and, in 2013, the Project More Doctors for Brazil (PMMB)[10].

In 2011, in order to provide permanent education to SUS professionals, the UNA-SUS Network[11] was created. Starting in 2013, the network was responsible for offering Family Health specialization courses to PROVAB and PMMB participants.

The increase in life expectancy resulting from the decrease in fertility and mortality rates is responsible for the growth in the proportion of elderly people in Brazil[12,13]. In 2006, the National Health Policy for the Elderly[14] created actions to promote an active and healthy aging. It also determined that, in primary care, teams should develop promotion, prevention, protection, diagnosis and rehab actions, being responsible for providing a comprehensive care to elderly users, registering elderly people living in the territory, welcoming them and conducting a multidimensional assessment[15,16].

The objective of this article is to compare changes in coverage and reach of care quality goals to elderly people among interventions conducted by PMMB and non-PMMB student-professionals under the scope of the Family Health specialization course of Universidade Federal de Pelotas (UFPel).

Method

Design

This cross-sectional study analyzed all 204 interventions focused on elderly health interventions conducted by student-professionals in the health units where they worked at.

Context

UFPel's course was focused on implementing an intervention in a typical programmatic primary care action in the service where student-professionals were allocated at[17]. According to the team and based on a situational analysis, the course set the focus for its intervention trying to understand the health service's true demand.

The course lasted for one year, during which time each student-professional: 1) developed a situational analysis of the Primary Care Unit (UBS) where they worked at; 2) created an intervention project; 3) conducted a three-month intervention; 4) assessed the intervention; and 5) wrote academic reports to managers and the community. The course completion essay was comprised of a set of documents related to the intervention, including spreadsheets and graphs with results and their analysis.

From July 2011 to July 2016, the course certified 2,173 professionals in eight classes: 1,050 PMMB doctors, 555 PROVAB doctors and nurses, and 568 doctors, nurses and dentists who signed up spontaneously. The interventions covered six programmatic actions: Prenatal and Puerperium, Child Health, High Blood Pressure and Diabetes Mellitus, Cervical and Breast Cancer, Elderly Health, and Oral Health.

Participants

For the purposes of this article, Elderly Health interventions conducted by 204 professional-students were analyzed.

Variables

The first outcome was the difference between the coverage achieved in the end of the third intervention month and the one achieved in the end of the first month. This difference was expressed in percentage points. For example, if there were one thousand elderly people living in the health unit's coverage area among which two hundred (20%) were included in the intervention in the first month and six hundred (60%) in the third, the difference would show an increase of forty percentage points in the intervention coverage.

Additionally, four other outcomes related to the quality of care were discussed here as quality indicators, i.e., proportion of elderly people with: 1) Brief Multidimensional Assessment (AMR); 2) up-to-date clinical examination; 3) assessment of the need for dental treatment; and 4) Elderly Health Handbook. This was the treatment of choice due to its design and potential use in monitoring and assessing actions. Estimates

were obtained by dividing the number of elderly people who undertook an action by the total number of elderly people included in the intervention, multiplied by 100. The percentage levels achieved in the end of the third intervention month related to the goal agreed upon among the professionals in their projects, as 100%, were taken into consideration in this calculation. The quality indicators were chosen based on the recommendations of Primary Care Guide no. 19 – Elderly Aging and Health, of the Ministry of Health[15], and of "SUS elderly care guidelines: a proposal for a comprehensive care model"[16].

The main exposure variable was the student-professional connection or not to PMMB. The other variables were: for student-professionals, education (nurse/doctors), sex (masculine/feminine) and nationality (Brazilian/Cuban/other); for health units, location (urban/rural/mixed), team population (up to or more than four thousand inhabitants), number of teams (one/two/more) and the intervention's target population (up to two hundred/201 to five hundred/more than five hundred); and for the city, population size in quartiles (up to 12,301/12,302 to 31,524/31,525 to 121,972/121,973 and more).

Data processing and analysis

Data was extracted from the data collection spreadsheets used by students to record interventions. Templates are available at https://dms.ufpel.edu.br/p2k/coletiva/ – Kurt Kloetzel Platform, Educational Family Health Platform. Data was also obtained from the course completion essay's final versions. Data related to each intervention was gathered in an Excel® spreadsheet and transferred to the statistic package Stata 12.0. The average of the outcomes was calculated according to the exposure variables. In all measures – coverage difference (in percentage points) and achievement of quality goals (in percentage) –, their respective 95% confidence interval was obtained. Differences among averages were tested using the t-test (dichotomous exposures) with a 5% significance level. All analyses were stratified according to their connection with PMMB. Differences were considered significant when there was no overlap of limits of the confidence intervals, corroborated by the t-test results.

Ethical aspects

The research project "Contributions of a continuing education process of doctors and nurses in the performance of Primary Care Units" was approved by the Research Ethics Committee of UFPel's School of Medicine, opinion 1.555.311. The student-professionals expressly authorized the use of their data.

Results

All interventions conducted with elderly people (n=204) were analyzed. The majority of the student-professionals were doctors (82%) and women (63%). Regarding their nationality, 49% of them were Cuban; 47%, Brazilian; and 4%, professionals from the following countries: Argentina, Belize, Colombia, Nigeria, Dominican Republic, Uruguay and Venezuela. Interventions occurred in health units

mostly focused on ESF (95%), located in urban areas (72%), with attached population of up to four thousand inhabitants (74%) and only one health team (74%). The intervention's target population varied from 39 to 3,323 elderly people: 59% from 201 to five hundred. The city's population distribution in quartiles shows that half of the interventions occurred in cities of up to 31,524 inhabitants (Table 1). More than half of the student-professionals (60%) were enrolled in PMMB.

Coverage difference

The average increase in coverage of the Elderly Health programmatic action was of 35.7 percentage points, being significantly higher (t=5.874, p<0.001) among interventions conducted by PMMB participants – 42.1 pp (95% CI 38.6, 45.7) – than among non-participants – 26.1 pp (95% CI 22.3, 30.0) (Table 1).

Compared to interventions conducted by Brazilians who participated in the study, those conducted by Cubans showed a bigger difference in coverage (t=7.223, p<0.001): 26 pp (22.4, 29,7) and 45.5 pp (41.8, 49.1), respectively. Interventions conducted in populations of up to 4,000 people showed a higher increase in coverage – 39.1 pp (95% CI 35.8, 42.5) – than those conducted in populations of more than 4,000 inhabitants – 27.2 pp (95% CI 22.3, 32.2) (t=3.747, p<0.001). The larger the population size, the smaller the coverage, with a great difference between smaller cities – 41.7 pp (95% CI 35.7, 47.6) – and larger ones – 29.1 pp (95% CI 23.6, 34.6) (t=3.131, p<0.01) (Table 1).

Larger increases in coverage were observed in interventions conducted by PMMB student-professionals, when compared to those that are not part of the program. The favorable pattern towards PMMB was also observed among female student-professionals among the interventions that occurred in urban, rural and mixed areas, in teams with up to 4,000 people under its responsibility, in health units with only one team, in all target population sizes and in cities of up to 31,524 inhabitants (Table 1).

In general, the increase in interventions conducted by doctors was significantly higher than those conducted by nurses. When comparing nurses with non-PMMB doctors, the difference is not significant (Table 1).

For the Brazilians who participated in the study, PMMB connection did not imply in a significant change in the increase in intervention coverage. Cubans achieved significantly higher average increases in coverage than all Brazilians who participated in the study (from PMMB, PROVAB or spontaneous walk-in) (Figure 1). The same pattern was observed considering the absolute number of elderly people who benefited from the interventions (Figure 2).

Table 1. Distribution of student-professionals and increase in the Elderly Health program coverage according to individual characteristics, health unit's characteristics, city's characteristics and PMMB connection. UNA-SUS/UFPel, 2016.

		n	%	Non-PMMB n=82 Percentage points (95% CI)	PMMB n=122 Percentage points (95% CI)	Total n=204 Percentage points (95% CI)
Student-professional	Education					
	Nurse	36	17.7	23.3 (17.8, 28.7)	N/A	23.2 (17.8, 28.7)
	Doctor	168	82.3	28.4 (22.8, 33.9)	42.1 (38.6, 45.7)	38.4 (35.2, 41.5)
	Sex					
	Male	75	36.8	30.4 (21.7, 39.2)	44.0 (38.3, 49.7)	40.6 (35.7, 45.5)
	Female	129	63.2	24.8 (20.4, 29.2)	40.5 (35.9, 45.2)	32.8 (29.4, 36.3)
	Nationality					
	Brazilian	95	46.6	26.1 (22.3, 30.0)	25.5 (12.4, 38.5)	26.0 (22.4, 29.7)
	Cuban	100	49.0	N/A[b]	45.5 (41.8, 49.1)	45.5 (41.8, 49.1)
	Other	9	4.4	N/A[b]	29.3 (15.0, 43.6)	29.3 (15.0, 43.6)
Health unit	Location					
	Urban	143	71.5	26.2 (21.3, 31.0)	38.3 (34.1, 42.5)	33.8 (30.5, 37.1)
	Rural/Mixed	57	28.5	27.3 (20.0, 34.7)	53.8 (48.3, 59.3)	41.7 (36.1, 47.3)
	Team population					
	Up to 4,000	149	73.8	27.1 (22.4, 31.8)	46.6 (42.8, 50.4)	39.1 (35.8, 42.5)
	More than 4,000	53	26.2	24.7 (17.3, 32.0)	29.3 (22.3, 36.3)	27.2 (22.3, 32.2)
	Number of teams					
	One	148	73.6	26.2 (21.8, 30.6)	43.7 (39.6, 47.8)	37.0 (33.7, 40.3)
	Two or more	53	26.4	27.8 (19.2, 36.3)	38.6 (31.0, 46.1)	33.9 (28.2, 39.6)
	Intervention's target population					
	Up to 200	41	20.1	28.4 (15.8, 40.9)	53.8 (48.3, 59.3)	45.7 (39.3, 52.1)
	201 to 500	121	59.3	27.9 (23.1, 32.8)	43.2 (38.5, 47.8)	36.2 (32.7, 39.8)
	More than 500	42	20.6	16.9 (11.2, 22.2)	28.1 (25.0, 35.7)	24.4 (18.9, 29.9)
City	Size (inhabitants in quartiles)					
	Up to 12,301	51	25	28.3 (19.7, 36.9)	51.8 (45.5, 58.1)	41.7 (35.7, 47.6)
	12,302 to 31,524	52	25.5	27.8 (14.5, 31.0)	44.6 (38.7, 50.6)	37.1 (31.6, 42.5)
	31,525 to 121,972	50	24.5	30.4 (19.6, 41.1)	37.3 (30.0, 44.6)	35.0 (29.1, 40.9)
	121,973 and more	51	25	23.7 (17.8, 29.7)	34.3 (25.2, 43.3)	29.1 (23.6, 34.6)
	Total	204	100	26.1 (22.3, 30.0)	42.1 (38.6, 45.7)	35.7 (32.9, 38.6)

CI = 95% confidence interval.
N/A = Not applicable: There were no PMMB nurses or foreigners.
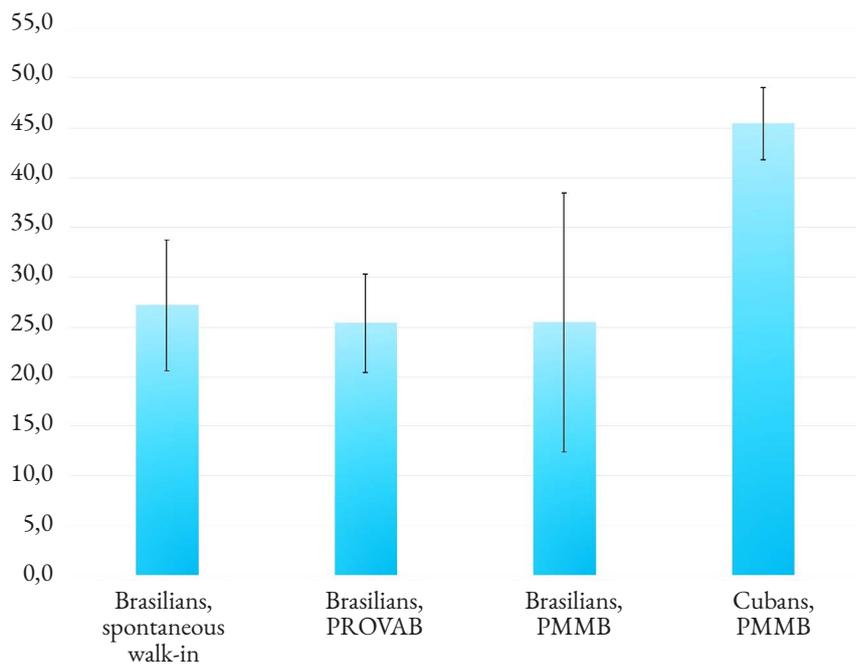
Figure 1. Average increase in coverage (percentage points) of elderly care actions according to the student-professional's nationality and supply program. UNA-SUS/UFPel, 2016.
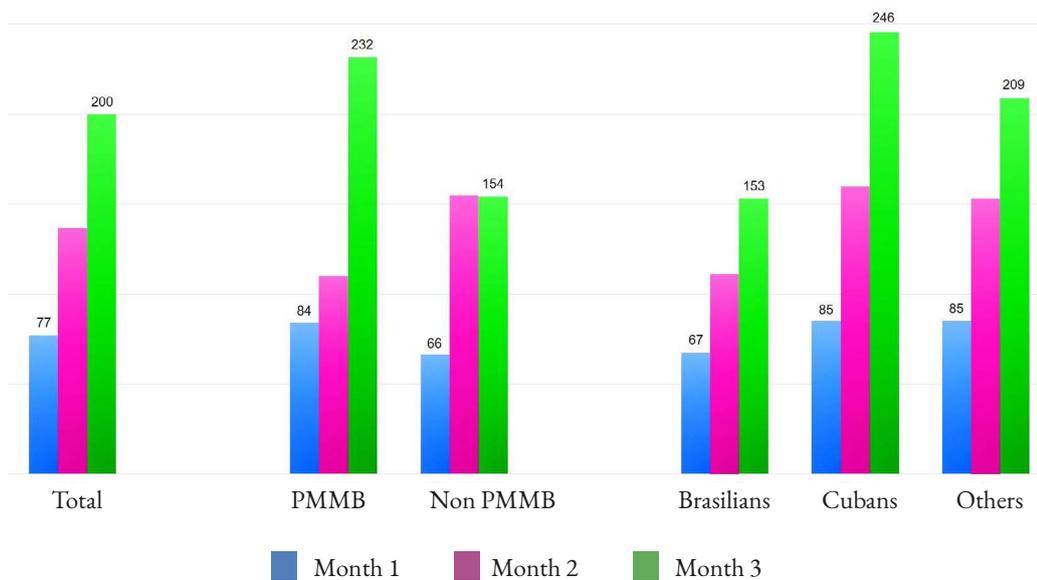

Figure 2. Absolute number of people who benefited from the elderly care interventions according to the student-professional's nationality and supply program. UNA-SUS/UFPel, 2016.

Quality indicators

Brief Multidimensional Assessment (AMR)

At the end of the three-month intervention, the average AMR performance in services was of 90.8%, being significantly higher among those related to PMMB – 95.5% (93.0, 97.9) – than non-PMMB – 83.1% (76.9, 89.2) (t=4.309, p<0.001). This favorable difference towards PMMB is also shown among female student-professionals among urban units, with team population of up to four thousand inhabitants and only one team (Table 2).

Up-to-date clinical examination

This indicator achieved an average of 94.5% and was higher (96.4%) in interventions conducted by PMMB student-professionals (95% CI 94.6, 98.3) when compared with those conducted by non-PMMB participants (90.5%) (95% CI 86.2, 94.9) (t=2.479, p<0.05). This difference was also shown when interventions were conducted by women and in which the team's population was of up to 4,000 inhabitants (Table 2).

Table 2. Achievement of quality goals (%) in AMR and clinical examination according to individual characteristics, health unit's characteristics, city's characteristics and PMMB connection. UNA-SUS/UFPel, 2016.

		AMR (%)			Up-to-date clinical examination (%)		
		Non-PMMB (95% CI)	PMMB (95% CI)	Total (95% CI)	Non-PMMB (95% CI)	PMMB (95% CI)	Total (95% CI)
Student-professional	**Education**						
	Nurse	79.3 (68.7, 89.9)	N/A	79.3 (68.7, 89.9)	88.7 (79.4, 98.1)	N/A	88.7 (79.4, 98.1)
	Doctor	85.8 (78.3, 93.4)	95.5 (93.0, 97.9)	93.0 (90.3, 95.7)	91.4 (86.3, 96.4)	96.4 (94.6, 98.3)	95.1 (93.2, 97.0)
	Sex						
	Male	84.4 (69.2, 99.5)	94.8 (91.0, 98.6)	92.2 (87.7, 96.8)	94.6 (88.3, 100.9)	95.6 (92.6, 98.6)	95.4 (92.7, 98.1)
	Female	82.7 (75.9, 89.5)	96.1 (92.9, 99.4)	89.9 (86.2, 93.7)	89.1 (83.5, 94.7)	97.1 (94.8, 99.4)	93.9 (91.2, 96.6)
	Nationality						
	Brazilian	83.1 (76.9, 89.2)	85.0 (68.7, 101.3)	83.4 (77.7, 89.0)	90.5 (86.2, 94.9)	93.4 (82.3, 100.5)	91.0 (87.0, 95.0)
	Cuban	--	96.6 (94.4, 98.8)	96.6 (94.4, 98.8)	--	96.9 (95.2, 98.7)	96.9 (95.2, 98.7)
	Other	--	98.2 (95.8, 100.6)	98.2 (95.8, 100.6)	--	95.3 (87.5, 100.3)	95.3 (87.5, 100.3)
Health unit	**Location**						
	Urban	78.7 (70.1, 87.3)	95.7 (92.9, 98.6)	89.7 (86.0, 93.5)	89.0 (83.0, 95.0)	96.3 (94.0, 98.7)	94.0 (91.6, 96.6)
	Rural/Mixed	91.6 (85.4, 97.8)	96.2 (92.0, 100.2)	94.1 (90.6, 97.7)	93.4 (87.3, 99.6)	97.1 (94.5, 99.8)	95.7 (92.8, 98.5)
	Team population						
	Up to 4,000	81.9 (74.4, 89.4)	96.1 (93.6, 98.6)	91.0 (87.7, 94.3)	89.7 (83.8, 95.7)	97.6 (96.3, 98.9)	95.1 (93.1, 97.3)
	More than 4,000	85.8 (74.4, 97.3)	95.6 (90.3, 101.0)	91.4 (85.7, 97.1)	92.1 (86.0, 98.2)	95.0 (89.8, 100.1)	93.8 (90.0, 97.6)
	Number of teams						
	One	83.4 (76.2, 90.7)	96.3 (93.8, 98.8)	91.6 (88.4, 94.8)	92.1 (87.3, 96.9)	97.4 (96.1, 98.8)	95.8 (94.0, 97.5)
	Two or more	82.3 (69.8, 94.8)	95.1 (89.8, 100.3)	89.7 (83.6, 95.7)	79.9 (60.2, 99.6)	95.0 (87.9, 102.1)	90.3 (82.8, 97.9)

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Table 2 – continuation

		AMR (%)			Up-to-date clinical examination (%)		
		Non-PMMB (95% CI)	PMMB (95% CI)	Total (95% CI)	Non-PMMB (95% CI)	PMMB (95% CI)	Total (95% CI)
city	**Size (inhabitants in quartiles)**						
	Up to 12,301	84.8 (73.7, 95.9)	95.4 (90.9, 100.0)	91.0 (85.7, 96.3)	87.4 (76.1, 98.7)	96.5 (93.4, 99.6)	93.1 (88.6, 97.6)
	12,302 to 31,524	84.8 (69.2, 100.4)	96.9 (92.5, 101.2)	93.2 (87.7, 98.7)	94.1 (86.5, 101.8)	98.0 (96.4, 99.5)	97.1 (94.8, 99.2)
	31,525 to 121,972	84.5 (73.3, 95.6)	95.3 (90.8, 99.8)	91.9 (87.3, 96.6)	92.5 (85.6, 99.3)	96.7 (93.9, 99.5)	95.6 (92.9, 98.2)
	121,973 and more	79.5 (65.7, 93.2)	94.0 (86.7, 101.3)	87.2 (79.6, 94.7)	89.9 (81.1, 98.7)	94.1 (86.8, 101.4)	92.3 (86.9, 97.7)
	Total	**83.1 (76.9, 89.2)**	**95.5 (93.0, 97.9)**	**90.8 (87.9, 93.7)**	**90.5 (86.2, 94.9)**	**96.4 (94.6, 98.3)**	**94.5 (92.5, 96.4)**

CI = 95% confidence interval.

N/A = Not applicable: There were no PMMB nurses or foreigners.

Assessment of the need for dental treatment

This indicator reached an average of 80.5% and was higher in interventions conducted by PMMB student-professionals (86.5%) (95% CI 81.7, 91.3) when compared with those conducted by other student-professionals (63.8%) (95% CI 52.8, 74.8) (t=3.799, p<0.01). The favorable pattern towards PMMB was also observed in interventions conducted by women in urban areas, performed by teams with population of up to 4,000 inhabitants with only one health team (Table 3).

Table 3. Achievement of quality goals in the assessment of the need for dental treatment and delivery of the Elderly Health Handbook according to individual characteristics, health unit's characteristics, city's characteristics and PMMB connection. UNA-SUS/UFPel, 2016.

		Assessment of the need for dental treatment (%)			Delivery of the Elderly Health Handbook (%)		
		Non-PMMB (95% CI)	PMMB (95% CI)	Total (95% CI)	Non-PMMB (95% CI)	PMMB (95% CI)	Total (95% CI)
Graduate	Education						
	Nurse	56.9 (37.1, 76.6)	N/A	56.9 (37.1, 76.6)	72.5 (62.0, 83.0)	N/A	72.5 (62.0, 83.0)
	Doctor	68.8 (55.3, 82.3)	86.5 (81.7, 91.3)	83.4 (78.8, 88.1)	76.5 (65.9, 87.1)	84.5 (79.5, 89.5)	82.3 (77.7, 86.9)
	Sex						
	Male	73.2 (50.0, 96.3)	79.6 (71.1, 88.1)	78.5 (70.6, 86.3)	76.5 (58.2, 94.8)	85.9 (78.4, 93.3)	83.5 (76.4, 90.6)
	Female	60.2 (47.2, 73.2)	92.4 (87.5, 97.3)	82.0 (75.9, 88.1)	74.2 (66.1, 82.4)	83.3 (76.4, 90.2)	78.8 (73.5, 84.2)
	Nationality						
	Brazilian	63.8 (52.8, 74.8)	82.1 (62.3, 101.9)	68.1 (58.5, 77.6)	74.7 (67.4, 82.1)	83.2 (64.5, 101.9)	75.9 (69.1, 82.7)
	Cuban	--	87.8 (83.0, 92.7)	87.8 (83.0, 92.7)	--	83.7 (78.1, 89.4)	83.7 (78.1, 89.4)
	Other	--	77.5 (45.1, 109.9)	77.5 (45.1, 109.9)	--	95.1 (86.9, 103.3)	95.1 (86.9, 103.3)

it continues

Table 3 – continuation

		Assessment of the need for dental treatment (%)			Delivery of the Elderly Health Handbook (%)		
		Non-PMMB (95% CI)	PMMB (95% CI)	Total (95% CI)	Non-PMMB (95% CI)	PMMB (95% CI)	Total (95% CI)
Health unit	Location						
	Urban	64.9 (51.0, 78.9)	86.9 (81.0, 92.8)	81.8 (76.0, 87.5)	74.2 (65.4, 82.9)	83.6 (77.6, 89.6)	80.1 (75.1, 85.1)
	Rural/Mixed	58.0 (36.0, 105.3)	86.2 (81.1, 99.3)	77.8 (68.5, 87.2)	74.4 (58.8, 90.0)	87.4 (77.9, 97.0)	81.5 (72.8, 90.2)
	Team population						
	Up to 4,000	63.7 (50.8, 76.7)	89.4 (85.0, 93.9)	82.9 (77.9, 87.9)	75.1 (66.1, 84.1)	87.8 (82.6, 92.9)	82.9 (78.2, 87.6)
	More than 4,000	60.8 (34.6, 87.0)	80.1 (66.7, 93.5)	74.8 (63.0, 86.6)	72.8 (58.5, 87.1)	77.2 (65.4, 89.0)	75.2 (66.4, 84.1)
	Number of teams						
	One	60.0 (45.9, 74.2)	87.2 (81.9, 92.5)	81.0 (75.4, 86.5)	79.1 (71.1, 87.1)	89.4 (84.9, 94.0)	85.4 (81.2, 89.7)
	Two or more	54.1 (19.2, 89.0)	87.6 (74.3, 100.9)	78.9 (65.6, 92.3)	61.7 (44.8, 78.6)	72.5 (59.4, 85.6)	67.8 (57.7, 78.0)
City	Size (inhabitants in quartiles)						
	Up to 12,301	67.6 (48.4, 86.8)	88.5 (81.0, 95.9)	81.4 (73.1, 89.6)	68.0 (50.1, 86.0)	88.4 (79.7, 97.0)	79.6 (70.3, 88.9)
	12,302 to 31,524	66.1 (37.3, 94.9)	86.3 (77.4, 95.1)	82.1 (73.1, 91.0)	76.9 (61.5, 92.3)	87.4 (79.3, 95.4)	83.7 (76.4, 91.1)
	31,525 to 121,972	42.1 (0.69, 83.5)	89.3 (79.7, 99.0)	81.9 (70.9, 92.8)	76.7 (58.3, 95.1)	81.4 (70.1, 92.7)	79.8 (70.4, 89.2)
	121,973 and more	67.9 (46.7, 89.1)	80.9 (66.8, 95.0)	76.6 (65.2, 87.9)	77.8 (66.3, 89.3)	80.3 (66.7, 93.8)	79.0 (70.4, 87.6)
	Total	63.8 (52.8, 74.8)	86.5 (81.7, 91.3)	80.5 (75.8, 85.3)	74.7 (67.4, 82.1)	84.5 (79.5, 89.5)	80.6 (76.3, 84.8)

CI = 95% confidence interval.
N/A = Not applicable: There were no PMMB nurses or foreigners.

Receipt of the Elderly Health Handbook

Considering all interventions, this indicator achieved an average of 80.6% of the goal and did not show significant differences regarding participation or not in PMMB: 84.5% (95% CI 79.5, 89.5) among PMMB participants and 74.7% (95% CI 67.4, 82.1) (t=2.270, p>0.05) in interventions conducted by other professionals. Regardless of connection or not with PMMB, the interventions conducted in units with more than one health team achieved only 67.8% of the goal (95% CI 57.7, 78.0), when compared with 85.4 (95% CI 81.2, 89.7) (t=3.201, p<0.01) in those that had only one team (Table 3).

Discussion

Interventions conducted by PMMB student-professionals showed a better performance. This effect was consistent both in the coverage increase and in the quality indicator improvement. The only exception was the indicator related to delivery of the Elderly Health Handbook, which did not show a significant difference among groups. The Ministry of Health and State Health Departments are responsible for delivering Elderly Health Handbooks[18]. Lack of significant difference among groups may be explained by the reliance on external factors to UBS.

The better evolution of coverage and quality indicators in interventions led by PMMB student-professionals can be related to the type of connection and to the professional profile that differentiates them.

Student-professionals who participated in the course through spontaneous walk-in did not have support for improvement, did not have an allotted time during working hours to study and did not have financial aid. PMMB student-professionals, on the other hand, had a three-year scholarship contract, according to which the course was a requirement and which provided for eight weekly hours of study. PMMB predominantly attracted foreign doctors, mostly Cubans, with previous experience in primary healthcare. This fact may have contributed to the results[8,19].

The better results in the evolution of coverage and quality indicators by doctors, when compared to nurses, were a result of the better performance PMMB professionals had. Therefore, performance of non-PMMB doctors and nurses was similar. If the work process organization had provided nurses with a comprehensive practice, as described in the National Primary Care Policy (PNAB)[7], their intervention performance could have been better and maybe similar to that of PMMB participants[20].

PROVAB doctor student-professionals were going through a transition. They were concluding their undergraduate studies and starting residency. This may be the reason why they were less dedicated to their interventions. PMMB participants, on the other hand, not only had experience and were graduated in primary healthcare but also had the program and health units as the main focus of their professional activities[19].

Among the study's limitations, it is important to consider that the coverage expansion may have been underestimated. It was not possible to draw a baseline prior to the intervention due to lack of adequate records to assess programmatic actions. Therefore, the short intervention period (three months), which is an academic cut of a real process in which student-professionals already performed the course's activities in UBS, may have limited the appreciation for the intervention's effect. However, this circumstance was the same for the entire sample and did not prevent the expression of differences among the compared interventions. The magnitude of the interventions' effect on the elderly healthcare program's coverage was highlighted.

The number of users that were reached gains relevance when considering that the health units in which the interventions were conducted are located in socially vulnerable areas. Consequently, it promoted greater health equity in this populational group[21-25]. In total, all 204 interventions had a target population of 86,245 elderly people in 155 Brazilian cities. Each intervention reached a total of 15,715 elderly people at the end of the first month and 40,972 at the end of the third month, i.e., a 2.6x increase.

Regarding quality indicators, AMR assesses functional and cognitive abilities. Functional abilities are related to the elderly conditions to develop activities required by the environment where they live at. Cognitive abilities are related to their conditions to deal with information provided by reality: recording, storing and giving a proper meaning to data. These aspects determine the autonomy and independence elderly people effectively have[26].

According to Sirena and Moriguchi[27], elderly care aims at promoting their health and preventing diseases. In order to do that, they need to take a detailed routine clinical examination, including checking high blood pressure and diabetes mellitus, vital signals and anthropometric data, as well as obtaining guidance for healthy life

habits. For those who have high blood pressure or diabetes, it is important to include cardiovascular risk stratification and foot examination.

Several ESF teams do not have dentists yet. However, some oral health aspects are under the scope of competence of other health professionals, who can diagnose oral hygiene issues, cavities, need for prosthesis, mucosal injury and tumors. If needed, they can also refer the case to a dentist in the main unit or to a dental specialty center[28-30].

The 2014 Elderly Health Handbook[18] enables the longitudinal follow-up of elderly people for five years. It contains information related to: health conditions, social and family network, self-care guidance and health professionals' guidance related to AMR and the work process organization. This indicator favors social control, since it enables users to know how their assistance should be conducted.

The quality indicator's results do not detect significant differences according to the size of the city. These results indicate that the interventions promoted equity in contrasting social contexts[21-25]. Additionally, the course strengthened the teaching-service integration through the assessed actions[28].

Cuban doctors, on the other hand, showed a better performance in three, of four, quality indicators. The student-professionals' nationality was always related to the higher difference in intervention coverage, regardless of other factors. Given the sample's profile (strong collinearity between Cuban nationality and PMMB connection), the advantageous results observed in PMMB interventions are due to the Cuban professionals' characteristics regarding medical education, and primary healthcare experience and specialization. The greater presence of Cuban doctors in smaller cities reinforces their contribution to the interventions' equity regarding social context[21-25,30].

Primary healthcare studies measuring the achievement of quality goals and improvement in coverage through an intervention process in the services' reality are still scarce in our field. Additionally, there is no evidence of better results obtained by PMMB participants in the elderly healthcare program. This article can subsidize public policies in education of professionals to primary healthcare, particularly those focused on teaching-service integration and elderly healthcare.

Conclusion

Interventions improved the performance of health actions in elderly care in all tested scenarios, regardless of the type of supply and professionals' nationality. Interventions conducted by PMMB professionals, particularly Cuban doctors, showed significantly better results, both in coverage increase and improvement of the actions' quality indicators.

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Authors' contributions

Maria Elizabeth Gastal Fassa, Elaine Tomasi and Luiz Augusto Facchini contributed to writing and designing the work and to the creation and review of the manuscript, as well as literature review, and data analysis and interpretation. Louriele Wachs and Leonardo Pozza Santos participated in the data collection and processing. Anaclaudia Gastal Fassa and Elaine Thumé participated in the data analysis and interpretation, and critical review of the content. Pâmela Volz and Leandro Rodrigues contributed to the literature review and preliminary versions of the manuscript. All listed authors participated in the discussion of the results, and revised and approved the final version to be published.

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