



# Length of stay in a behavior change program in Primary Health Care: “VAMOS” Program

Permanência em um programa de mudança de comportamento na Atenção Primária à Saúde: Programa “VAMOS”

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## ABSTRACT

The present study aims to analyze the length of stay of adults and elderly individuals in the “Vida Ativa Melhorando a Saúde” (VAMOS - Active Life Improving Health) program implemented in Primary Health Care (PHC) in Brazil. A total of 106 users (87.7% females) aged 55.42 years ( $\pm 12.22$ ) were followed during 12 weeks in four Community Health Centers. Length of stay was analyzed according to socio-demographic variables (sex, age, marital status, level of education, current occupation, family income) and the indicators of VAMOS program effectiveness (physical activity level and food intake). Descriptive statistics, chi-square test, survival analysis applied by the Kaplan-Meier method and multivariate COX regression model were used. A significance level of 5% was adopted in all analyses. The rate of length of stay was 51.9% ( $n = 55$ ). Marital status was associated with a longer length of stay ( $p < 0.05$ ). Furthermore, having a partner (OR = 2.11; 95%CI: 1.16 - 3.81) was associated with a longer length of stay in the program. In conclusion, more than half of the adults and elderly individuals remained in the VAMOS Program and length of stay was greater among those with a partner.

**Keywords:** Behavior; Motor activity; Healthy diet; Public health.

## RESUMO

*O estudo tem como objetivo analisar a permanência de adultos e idosos no Programa Vida Ativa Melhorando a Saúde (VAMOS), implantado na Atenção Primária à Saúde de Florianópolis, Santa Catarina. Foram acompanhados 106 usuários (87,7% mulheres), com idade média de 55,42 anos ( $\pm 12,22$ ) durante 12 semanas, em quatro Unidades Básicas de Saúde. A permanência foi analisada considerando as variáveis sociodemográficas (sexo, idade, estado civil, escolaridade, ocupação atual e renda familiar mensal) e os marcadores de efetividade do VAMOS (nível de atividade física e consumo alimentar). Foi utilizada estatística descritiva, teste de Qui-Quadrado, análise de sobrevivência pelo método de Kaplan-Meier e análise multivariada de regressão de COX. O nível de significância adotado foi 5%, em todas as análises. A taxa de permanência foi de 51,9% ( $n = 55$ ). Estado civil foi associado com maior permanência ( $p < 0,05$ ) no programa. O fato de ter companheiro (OR = 2,11; IC95%: 1,16 - 3,81) aumentou a chance de permanecer no programa. Concluiu-se que mais da metade dos adultos e idosos permaneceram no Programa VAMOS e a permanência foi maior entre aqueles com companheiro.*

**Palavras-chave:** Comportamento; Atividade motora; Dieta saudável; Saúde pública.

## Introduction

Public policies have played an important role in health promotion, aiming to spread and enable the mass use of actions that can contribute to the reduction in mortality rate by non-communicable chronic diseases, which currently affect nearly 70% of the population worldwide. In Brazil, the situation is even more alarming, as these di-

seases correspond to 73% of causes of death, especially in populations with a low level of education and income<sup>1</sup>.

The Política Nacional de Promoção de Saúde (PNPS - National Health Promotion Policy) is among the documents endorsed by the Ministry of Health, including strategies and actions from the Sistema Único de Saúde (SUS - Unified Health System), especially

Primary Health Care (PHC), aimed at promoting health and reducing risk factors for chronic diseases<sup>2</sup>. To achieve this, between 2006 and 2014, there was an increase in federal resources allocated for health promotion programs. Approximately R\$ 170 million were sent to all Brazilian regions to implement sustainable continuing actions, including physical activity (PA) promotion and healthy eating<sup>3</sup>.

However, maintaining the population's adherence to these programs<sup>4,5</sup> appears to be a challenge. Dropout rates associated with PA promotion<sup>6,7</sup>, healthy eating<sup>8</sup> or a combination of such types of behavior<sup>9</sup> can reach up to 68%. Thus, to seek estimates about length of stay and the characteristics associated with community programs and to understand such dynamics can support the adoption of more sustainable health promotion mechanisms, especially for adults and the elderly, the age groups more frequently found in PHC programs<sup>10,11</sup>.

Although actions focused on PA practice and/or healthy eating have received more and more attention in Brazil, programs using behavioral techniques are still scarce<sup>12</sup>. Behavior change programs implemented in PHC show high effectiveness and can contribute to users' length of stay in these programs<sup>13</sup>.

In this sense, a program developed according to PHC configurations and based on behavioral change techniques known as "Vida Ativa Melhorando a Saúde" (VAMOS - Active Life Improving Health) is a pioneer in Brazil, as it aims to motivate adults and elderly individuals to adopt new behavior towards PA and eating<sup>14,15</sup>. The VAMOS Program is based on socio-cognitive theory constructs and strategies<sup>16</sup>, which have been used as the foundation for the majority of behavior change programs<sup>12</sup>. As it is an innovative technology, its application to PHC has been tested to understand its potential as a behavior change program for a healthy active lifestyle among health system users. Thus, the present study aimed to analyze the length of stay of adults and elderly individuals in the VAMOS Program implemented in PHC in the city of Florianópolis, Southern Brazil.

## Methods

The present study was part of a research project on community intervention performed in 2016-2017 in Unidades Básicas de Saúde (UBS - Community Health Centers) in the city of Florianópolis, Santa Catarina state, Southern Brazil. This study was approved by the Human Research Ethics Committee of the Federal University of Santa Catarina (number 1,394,492) and

registered with Clinical Trials (<https://clinicaltrials.gov/ct2/home/NCT02823301>).

This intervention was developed in four UBS by professionals from the Núcleo Ampliado da Saúde da Família e Atenção Básica (NASF-AB - Primary Care and Family Health Center) who accepted to implement the program and followed 106 users enrolled in the VAMOS Program. As inclusion criteria, participants had to be aged 18 or older; to be registered with the UBS and to have been a user of this service for six months prior to the study; to be categorized as inactive or insufficiently active (less than 150 weekly minutes of moderate and vigorous PA) and/or to be overweight or have severe health conditions (hypertension, diabetes, dyslipidemia, cardiovascular diseases and others).

The intervention program occurred in the UBS facilities, for 12 months, in weekly meetings held in person. These meetings lasted from 90 to 120 minutes each and were conducted by Physical Education (PE) professionals certified in a 20-hour online training program ([www.vamos.ufsc.br](http://www.vamos.ufsc.br)). The methodology used was health education aimed at the specific theme for which the educational material was made available for free (12 booklets plus one appendix) corresponding to the subject approached weekly. The contents included strategies for behavioral change in PA and eating<sup>15</sup>. In each of the UBSs, all participants held a meeting on the same day and at the same time and they were invited by the health team through flyers and posters distributed in the UBSs, in the community and in home visits.

Length of stay was characterized by participation in all program stages. Records of the presence of participants in the 12 stages were used to obtain this information. In case of absences, the protocol required PE professionals to contact participants by phone to identify the reason for the absence and/or dropout. For those who were absent, a make-up session with the program content was set up at a different time. Program dropouts were considered to be those who missed one or more stages, without a make-up session or subsequent return.

PA level was assessed with an Actigraph accelerometer (GT3X and GT3X+). Each participant was instructed to use the device on the right side of their waist, attached with an elastic band, for seven consecutive days, only removing it when sleeping or doing physical activity in the water. Aiming to make an analysis, data were considered to be valid when at least ten hours of daily recording were made, for at least four days, three of which during the week and one over the weekend.

Periods with consecutive zeros during 60 minutes or more were interpreted as no-use time and thus excluded from the analysis. Data were collected in a frequency of 30Hz and analyzed using 60-second epochs. The daily mean of minutes in bouts was taken into consideration (period of time  $\geq 10$  continuous minutes) of moderate/vigorous physical activity. Analysis was performed with ActiLife 6.10 software, weighing values according to the number of valid days and times of use.

For the present study, socio-demographic variables (sex, age, level of education, marital status, current occupation, monthly family income) and indicators of VAMOS Program effectiveness (PA and food consumption) were used. Due to the analysis performed, variables were dichotomized as follows: sex (female and male); age group (< 60 years and  $\geq 60$  years); marital status (without a partner [including single, separated, divorced and widowed] and with a partner [married, cohabiting]); level of education (up to eight school years and nine or more school years); current occupation (without an occupation and with an occupation); monthly family income [average/low < R\$ 3,520.00] and average/high [ $\geq$  R\$ 3,521.00]; PA level: (insufficiently active [ $< 150$  minutes of moderate/vigorous PA per week] and active [ $\geq 150$  minutes of moderate/vigorous PA per week]); and consumption of fruits (up to one portion/day and two or more portions/day).

The analyses took two groups into consideration: remaining and dropouts. Elements of descriptive statistics were used to characterize the variables and the chi-square test was applied to verify the relationship between groups. The Kaplan-Meier estimator was used as a strategy to observe length of stay. Aiming to compare the conditions for those who remained in the program, according to category and variable, the Log-Rank test for univariate analysis was applied. Multivariate analysis was performed with the Cox regression model and shown as odds ratio (OR), adopting a confidence interval of 95%. Variables considered to be significant or reaching a p value = 0.20 in the univariate model were included in the final model. Analyses were performed with the SPSS® software, version 22.0, adopting a significance level of 5%.

## Results

A total of 106 users (87.7% women), aged between 24 and 81 years ( $55.42 \pm 12.22$  years), participated in the present study. The majority of them lived without a partner (54.7%), and had nine or more school years

(60.4%), no current occupation (61.3%) and an average/low family income (75.5%). Regarding indicators of VAMOS Program effectiveness, 81.7% were categorized as insufficiently active during leisure time and six out of every ten reported consuming two or more portions of fruit per day (61.4%). At the end of 12 weeks of the program, the rate for length of stay was 51.9% ( $n = 55$ ). A higher number of participants with a partner (30.2% vs 21.7%;  $p < 0.010$ ) and low/average income (34.9% vs 17.0%;  $p < 0.034$ ) remained in the program.

**Table 1** – Characterization of VAMOS Program participants, city of Florianópolis, Brazil, 2016-2017 ( $n = 106$ ).

Variable	Total	Remaining	Dropout	p*
	n (%)	n (%)	n (%)	
	106 (100)	55 (51.9%)	51 (48.1%)	
Sex				
Female	93 (87.7)	47 (44.3)	46 (43.4)	0.329
Male	13 (12.2)	8 (7.5)	5 (4.7)	
Age group				
< 60 years	63 (59.5)	29 (27.4)	34 (32.1)	0.103
60 years or +	43 (40.5)	26 (24.5)	17 (16.0)	
Marital status**				
Without a partner	58 (54.7)	23 (21.7)	35 (33.0)	0.010*
With a partner	48 (45.3)	32 (30.2)	16 (15.1)	
Level of education				
Up to 8 school years	42 (39.6)	23 (21.7)	19 (17.9)	0.390
9 or + school years	64 (60.4)	32 (30.2)	32 (30.2)	
Current occupation				
No	65 (61.3)	35 (33.0)	30 (28.3)	0.379
Yes	41 (37.8)	20 (18.0)	21 (19.8)	
Monthly family income***				
Mean/low	80 (75.5)	37 (34.9)	43 (40.5)	0.034*
Mean/high	26 (24.5)	18 (17.0)	8 (7.5)	
Physical activity level****				
Insufficiently active	76 (81.7)	40 (43.0)	36 (38.7)	0.425
Active	17 (18.3)	10 (10.8)	7 (7.5)	
Consumption of fruits				
Up to 1 portion/day	41 (38.7)	19 (17.9)	22 (20.8)	0.240
2 or + portions/day	65 (61.4)	36 (34.0)	29 (27.4)	

\*  $p < 0.05$  = Chi-square test; \*\* Without a partner (single, separated, divorced and widowed); With a partner (married); \*\*\* Average/low < R\$3,520.00; Average/low  $\geq$  R\$3,521.00; \*\*\*\* Insufficiently active < 150 minutes/week; Active  $\geq 150$  minutes/week.

The highest dropout rate (27.3%;  $n = 29$ ) was found during the three first weeks of the program, totaling 64.4% ( $n = 45$ ) of all dropouts (Table 2). A total of 9.8% ( $n = 5$ ) reported not adapting to the program's proposal. The majority of reasons for dropping out were not associated with program-related questions,

but rather with external situations (43.1% work/study; 25,5% health problems; 21.6% did not respond).

Table 3 shows the association between sociodemographic variables and the length of stay in the VAMOS

Program. Only marital status was associated with the outcome studied and the fact that one lived with a partner showed a greater chance of staying in the program (OR = 2.08; 95%CI: 1.15 - 3.76).

**Table 2** – Distribution of length of stay of VAMOS Program participants, city of Florianópolis, Brazil, 2016-2017 (n = 106).

Week	Remaining	Dropouts	Cumulative (%) <sup>a</sup>	95%CI	ER
1	106	12	88.7	88.0 - 89.4	11.3
2	94	10	72.2	71.4 - 73.0	9.4
3	84	7	72.6	71.8 - 73.4	6.6
4	77	2	70.8	70.0 - 71.6	1.9
5	75	5	66.0	65.1 - 66.9	4.7
6	70	2	64.2	63.3 - 65.1	1.9
7	68	5	59.4	58.5 - 60.3	4.7
8	63	4	55.7	54.8 - 56.6	3.8
9	59	2	53.8	52.8 - 54.8	1.9
10	57	2	51.9	50.9 - 52.9	1.9
11	55	0	51.9	50.9 - 52.9	0
12	55	0	51.9	50.9 - 52.9	0
Mean	71.91	4.25			
Standard deviation	16.21	3.79			

\* Related to the remaining ones

95%CI = 95% confidence interval of length of stay; ER = estimated risk for sample loss.

**Table 3** – Cox regression analysis for length of stay in the VAMOS Program, city of Florianópolis, Brasil, 2016-2017 (n = 106).

Socio-demographic variable	Remaining	Crude analysis	P	Adjusted analysis**	P
	n (%)	OR (95%CI)		OR (95%CI)	
Sex					
Female	47 (50.5)	1			
Male	8 (61.5)	0.74 (0.29 - 1.85)	0.452		
Age group					
< 60 years	29 (46.0)	1			
60 years or +	26 (60.5)	1.32 (0.65 - 2.68)	0.449		
Marital status					
Without a partner	23 (39.7)	1		1	
With a partner	32 (66.7)	2.62 (1.31 - 5.28)	<0.007	2.08 (1.15 - 3.76)	<0.016
Level of education					
Up to 8 school years	23 (54.8)	1			
9 or + school years	32 (50.0)	1.04 (0.50 - 2.13)	0.923		
Current occupation					
No	35 (53.8)	1			
Yes	20 (40.8)	0.81 (0.41 - 1.59)	0.540		
Monthly family income					
Average/low	37 (46.2)	1		1	<0.133
Average/high	18 (69.2)	2.02 (0.88 - 4.67)	0.098	1.79 (0.84 - 3.81)	
Lifestyle variable					
Physical activity level*					
Insufficiently active	40 (52.6)	1			
Active	10 (58.8)	1.08 (0.45 - 2.57)	0.862		
Fruit consumption					
Up to 1 portion/day	19 (46.3)	1			
2 or + portions/day	36 (55.4)	0.95 (0.49 - 1.84)	0.872		

\* n = 93. OR = odds ratio; 95%CI = 95% confidence of interval; \*\* Adjusted analysis for "marital status" and "monthly family income".

## Discussion

VAMOS participants showed a length of stay of nearly 50%, being higher among those living with a partner. The fact that approximately five out of every ten participants concluded this program shows that this result is similar to the rates found in other interventions of PA and healthy eating promotion in PHC<sup>10,16,17-19</sup>, ranging from 41.2%<sup>16</sup> to 58.1%<sup>10</sup>.

Having a partner increased the chance of staying in the VAMOS Program by two times. Although the literature has shown that living alone is associated with a higher probability of participating in community programs<sup>24</sup>, evidence reveals that length of stay is related to socialization and support from family and/or friends<sup>20</sup>. A previous study tested the VAMOS Program with adults and elderly individuals in the UBSs and found that social support was emphasized as a facilitator of program participation<sup>25</sup>. This reinforces the VAMOS Program principles, among which social support is essential for effective changes to occur.

Studies on the VAMOS Program have shown positive results, such as the reduction in sedentary behavior, an increase in mild PA, an increase of 10% in PA time with a moderate/vigorous intensity, lower consumption of industrialized seasonings, and an increase in the consumption of raw vegetables. These results have had a direct influence on participants' quality of life<sup>26,27</sup>.

For this reason, it is important to study the survival rate of individuals participating in interventions, as their effectiveness could be associated with the decrease in health expenses. When investments in public health are taken into consideration, the VAMOS Program shows a lower cost, compared to programs known as traditional (which depend on specific guidance from a PE professional to offer physical activities lasting 60 minutes, two to three times a week)<sup>13,14,15</sup>. Considering the public health context, if five out of every ten individuals remain in the program, there will be a total of 50% who have a significant potential to change their behavior towards PA and diet and to reduce health service expenses. Thus, we believe that the promotion of programs such as VAMOS can increase population coverage and, as a result, reduce public health expenses, especially in PHC, contributing to a more effective health system.

Another important fact was that two thirds of dropouts occurred in the three first weeks of implementation of the VAMOS Program. Evidence points out that the first stages of interventions have a greater impact on the proportion of dropouts<sup>10,18</sup> and that

health problems, lack of time, low economic conditions, distance from the Program location, and lack of a partner are the most frequent reasons<sup>20-22</sup>.

Although dropping out was associated with factors that were external to the program, the results indicate that the promotion strategies should be reviewed to improve the adherence process and maximize the length of stay of program participants. To establish actions with a focus on participants' expectations about the program in the first stages can be an alternative. To sensitize health teams, aiming to qualify program promotion, and to provide it in locations with greater access, including different times, can also have an impact on length of stay in the VAMOS Program.

The theory that served as the foundation for the VAMOS Program considers the fact that self-efficacy can influence behavioral change, thus explaining program dropouts. Individuals with low self-esteem give up when facing difficulties, unlike those with high self-efficacy<sup>23</sup>. Consequently, individuals engaged in behavior change programs can lead to great expectations about the results. However, when they realize that success depends on their individual efforts, they may give up easily.

As a behavior change program, the VAMOS Program is aimed at individual goals and autonomy development. To achieve this, it uses strategies directed towards small changes in lifestyle that can be implemented and maintained after 12 weeks of intervention. Therefore, it is an innovative technology with potential to be incorporated into PHC as a health promotion action, because its main goal is to motivate individuals to adopt an active and healthy lifestyle.

Data characterizing the retention rate and predictive factors for community participation in a behavior change program are important for decision-making, as far as planning and implementation of such interventions are concerned. On the other hand, not making a qualitative assessment of the reasons for participants to stay in the program and the causes that led to dropouts was one of the study limitations.

The results found enabled us to characterize the group and estimate that more than half of the adults and elderly individuals concluded the program and that length of stay was higher among those with a partner. These findings are important for the sustainability of the program and other similar interventions in the context of public health.

## Conflicts of interest

The authors declare no conflict of interest.

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## Authors' contributions

Konrad LM, Tomicki C and Ribeiro CG equally contributed to the study design, analysis and data interpretation. Bezerra JB and Maciel EC contributed to the article writing, and critical review of the intellectual content. Rech CR contributed to the analyses, data interpretation and critical review of the intellectual content. Pitanga FG and Benedetti TRB were responsible for the critical review of the article and approval of the final version.

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