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Concurrent validity of the assessment tool for a health promotion program in Primary Health Care via telephone: a multilevel analysis

Validade concorrente do instrumento de avaliação de um programa de promoção de saúde na Atenção Primária à Saúde por telefone: uma análise multinível

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ABSTRACT

This study aims to verify the concurrent validity of the paper, and the telephone versions of the instrument used to evaluate the effectiveness of the *Vida Ativa Melhorando a Saúde* (VAMOS) Program participants. The VAMOS Program is a community-based intervention aiming at motivating people to adopt an active and healthy lifestyle. The study population was adults registered at the Basic Health Units in the state of Santa Catarina, and the sample for the validity test was two groups that concluded the program. To compare each variable provided by paper and telephone format, multilevel generalized linear and logistic models were carried out, adjusted by age, sex, and educational level. As a result, it was possible to identify the validity of most of the questions, with variations in the frequency of cooked vegetable consumption, method of preparing animal meat, frequency of physical activity, and waist circumference. We concluded that the use of the telephone survey could be considered for VAMOS Program effectiveness evaluation.

Keywords: Validation study; Surveys and questionnaires; Program evaluation; Primary Health Care.

RESUMO

Este estudo teve como objetivo verificar a validade concorrente das versões papel e ligação telefônica do instrumento utilizado para avaliar a efetividade do Programa Vida Ativa Melhorando a Saúde (VAMOS). O Programa VAMOS é uma intervenção de base comunitária, com o objetivo de motivar as pessoas a adotarem um estilo de vida ativo e saudável. A população do estudo foi de adultos registrados nas Unidades Básicas de Saúde do estado de Santa Catarina, e a amostra para o teste de validade considerou dois grupos que concluíram o programa. Para comparar cada variável fornecida pelo formato papel e telefone, foram realizados modelos lineares e logísticos generalizados multiníveis, ajustados por idade, sexo e nível de escolaridade. Como resultado, foi possível identificar a validade da maioria das questões, com variações na frequência de consumo de hortaliças cozidas, modo de preparo da carne animal, frequência de atividade física e circunferência da cintura. Concluímos que o uso da coleta por telefone pode ser considerado para a avaliação da efetividade do Programa VAMOS.

Palavras-chave: *Estudo de validação; Inquéritos e questionários; Avaliação de programas; Atenção Primária à Saúde.*

Introduction

There are different strategies and formats for behavior change programs. The Active Life Improved Health (VAMOS) Program is an example and was implemented for the first time in 2012[1]. This program stands out in the Brazilian scenario because it has been effective for positive health behavior changes (such as physical activity and eating behaviors) and also implemented in different settings across the country[2].

Strategies to optimize the evaluation of health promotion programs are important to verify their effectiveness. However, some limitations arise in this scenario, especially concerning the follow-up of the programs. Some authors suggest that, as perspectives, assessments with less complex and more flexible instruments be inserted and tested, such as self-report and remote alter-

natives[3,4]. There is also a reflection on the response rate improvement in the follow-ups, which can be done using more than one data collection format [5].

Among the format available, telephone, electronic and postal devices can be mentioned[6]. The use of telephone is already used in surveys and has known strengths (such as greater clarification of questions, lower financial cost, reduction of time spent, and better response rate) and limitations (lack of visual resources and difficulty in interacting with the participant)[6].

Silva et al.[7] validated the instrument to evaluate the VAMOS Program individual markers. So it is expected that, through the concurrent validity of the instrument formats, it will be possible to compare these measures at the baseline, post-intervention, and maintenance, as well as the expansion of the evaluation of the program markers for future implementations.

Remote resources have emerged as an alternative to social distancing measures to contain the COVID-19 pandemic in the past years. Thus, to adapt the data collection and respect social distancing measures, and enable future observations with complementary resources, the present study aims to verify the concurrent validity of the paper, and the telephone versions of the instrument used to evaluate the effectiveness of the VAMOS Program participants.

Methods

The present study is based on a community-based intervention research project entitled "VAMOS Program: from training to implementation". The intervention included 17 groups in Basic Health Units of Primary Health Care in Santa Catarina. These groups were based in 16 cities, covering five of the six regions of the state.

The VAMOS Program is a behavior change intervention that aims to motivate people to adopt an active and healthy lifestyle[2]. The program's markers are related to physical activity, eating habits, quality of life self-perception, and anthropometric measurements. The program is based on the Social Cognitive Theory (TSC), based on collective constructions to help people adopt and maintain a healthier lifestyle. The VAMOS Program has the protocol is described elsewhere[8].

Although the program has been implemented in 16 municipalities, it was decided to consider a sub-sample to conduct the validity study. Thus, participants were selected by convenience. We opted for two groups in different municipalities, which had the availability of health professionals. It should be noted that those groups considered had the largest number of participants (to attend at least 20% of the participants) and characteristics similar to the study population.

We used a questionnaire consisting of sociodemographic variables, questions about food consumption and frequency, health indicators, quality of life, physical activity during leisure time, commuting, work and housing, and sedentary behavior as sitting time during weekdays and weekends. The questionnaire allowed information on the effectiveness of the VAMOS Program markers. Also, height (m), body mass (kg), and waist circumference (cm) were measured by a health professional. The proposed instruments were validated after a literature review[7].

In April 2021, during the COVID-19 pandemic, the first contact was made with health professionals responsible for the selected groups. With their agreement, a second contact was made, and the materials for the paper version data collection were sent. Thus, eligible participants were contacted by the respective responsible to inform them of the authenticity of the VAMOS team call.

Once aware of the researchers' contact, the telephone numbers were confirmed. Then, was scheduled the data collection by telephone (the participants indicated a time of greater availability), and, finally, the participants were asked to provide a measuring tape.

Data collection was conducted in May 2021. The protocol considered three call attempts based on the participants' preferences on different days. Two researchers trained to conduct the research carried out the calls, and random calls were checked for protocol standardization.

After completing the telephone data collection, the health professionals had up to five business days to collect the data in the paper version to avoid response variability. The data collection of the paper version (*in loco*) considered the application of a questionnaire under a health professional availability to give the necessary instructions to the participants, and the environment should be without interruptions. The health professionals were responsible for took the anthropometric measurements.

The analytical workflow of the present study included descriptive analysis in absolute (n) and relative (%) proportion values and averages of sample characteristics and responses to items, according to the applied version (paper and telephone call). Descriptions were accompanied by a 95% confidence interval (95%CI). For the inferential analysis, a multilevel generalized linear regression was used for the continuous outcomes

and a multilevel logistic regression for the binomial outcome. The outcome variable was version identification (paper/ telephone), and the exposure variables were the questions. The models were adjusted for sex (men/women), age (continuous), and educational level (up to incomplete high school/completed high school/ tertiary education or more).

The protocol was approved by the Ethics Committee of the Federal University of Santa Catarina (n.1.360.210). The study was registered in the Brazilian Registry of Clinical Trials (http://www.ensaiosclinicos.gov.br/; reference RBR-2vw77q). All participants signed the Informed Consent Form at the baseline collection (March 2019) and gave a verbal addendum at the follow-up (4,704,081 of May 11, 2021).

Results

The reliability of the instrument's assessment method considered 40 participants, with a response rate of 80% of those eligible (n = 50). Of these, 85% were women, with an average age of 47 years, white, married or with a partner, schooling up to high school, retired or employed, and with family income between 2 and 4 minimum wages. A difference was observed in mean age when compared to overall participants (Table 1).

The proportions between the instrument responses are shown in Table 2. Given this analysis, it is possible to verify that the questions did not show variation in the estimated error, given the different evaluation formats. However, it is possible to identify that in the answers by telephone, the categories with the worst perception were the most reported when purchased with the measures carried out in the paper version. The estimated error ranged between 0.12 for the sugary drinks consumption variable and 0.37 for the milk consumption. However, the telephone version seems to underestimate the frequency of consumption of cooked vegetables and overestimate the quality of the prepared meat. It was possible to identify a difference in the regular physical activity frequency, which was discreetly higher over the telephone. The highest variability according to the estimated errors was placed in the unit of measurement of time (minutes/day) in different intensities of physical activity and time spent sitting on the weekend. The duration of walking, vigorous physical activity, and sitting time on a weekday and during the weekend seemed to be slightly higher on paper. The moderate physical activity was slightly higher over the telephone. Finally, waist circumference varied substantially between assessment approaches. Self-measurement performed in the telephone version overestimated the observation conducted by the health professional in the paper version.

Table 1 – Socioeconomic and demographic variables of the VAMOS Program participants and the subsample for validity collection. Santa Catarina, Brazil, 2019-2021.

Variables	Mean or Proportion (95%CI)		p-value[a]
	2019	2021	
	(n = 191)	(n = 40)	
Age (years)	55.0 (22.9; 83.3)	46.8 (28.2; 68.6)	<0.001
Sex			0.608
Men	23 (12.0)	6 (15.0)	
Women	168 (88)	34 (85.0)	
Race			0.918
White	164 (85.9)	35 (87.5)	
Black	3 (1.6)	1 (2.5)	
Pardo (mixed)	23 (12.0)	4 (10)	
Asian	1 (0.5)	0	
Marital status			0.905
Single	17 (8.9)	3 (7.5)	
Married/living with partner	131 (68.6)	29 (72.5)	
Divorced/separated	21 (11.0)	3 (7.5)	
Widowed	22 (11.5)	5 (12.5)	
Educational level			0.565
No education	0	0	
Primary school incomplete	44 (23.0)	9 (22.5)	
Primary school complete	27 (14.1)	9 (22.5)	
High school incomplete	20 (10.5)	6 (15.0)	
High school complete	52 (27.1)	10 (25.0)	
Undergraduate incomplete	34 (17.8)	5 (12.5)	
Undergraduate degree	0	0	
Graduate	14 (7.3)	1 (2.5)	
Occupation (job)			0.759
Without a job	1 (0.5)	0	
At home	39 (20.4)	6 (15.0)	
Retired	72 (37.7)	18 (45.0)	
Employed	79 (41.4)	16 (40.0)	
Family gross household income			0.270
Refuse to answer	55 (28.8)	13 (32.5)	
< 1 salary	17 (8.9)	3 (7.5)	
1 a 2 salaries	47 (24.6)	16 (40.0)	
2,1 a 4 salaries	60 (31.4)	7 (17.5)	
4,1 a 6 salaries	8 (4.2)	1 (2.5)	
> 6 salaries	4 (2.1)	0	

[a]Crude model

Discussion

The present study aimed to verify the concurrent validity of the paper and the telephone versions of the instrument used to evaluate the effectiveness of VAMOS

Table 2 – Current validity of instrument to evaluate the VAMOS Program individual markers according to the format of evaluation. Santa Catarina, Brazil, 2021 (n = 40).

Variable	Est. Error[a]	*p*-value[a]	Data-level re siduals
Health perception	0.19	0.111	0.33 (0.21; 0.51)
Quality of life perception	0.14	0.423	0.18 (0.11; 0.28)
Water	0.31	0.198	0.47 (0.30; 0.73)
Beans	0.23	0.956	0.39 (0.25; 0.61)
Raw vegetables	0.19	0.290	0.26 (0.17; 0.40)
Cooked vegetables	0.28	0.020	0.69 (0.44; 1.06)
Meat	0.24	0.269	0.58 (0.38; 0.91)
Meat prepare	0.12	0.015	0.13 (0.08; 0.20)
Fruits	0.21	0.139	0.43 (0.28; 0.67)
Fruits per day	0.16	0.640	0.24 (0.15; 0.36)
Soft drinks and artificial juices	0.12	0.100	0.10 (0.07; 0.16)
Milk	0.37	0.089	1.02 (0.66; 1.59)
Sweets	0.26	0.327	0.55 (0.36; 0.86)
Snacks	0.29	0.442	0.73 (0.47; 1.13)
Walking frequency	0.64	0.977	4.22 (2.72; 6.54)
Walking duration	16.77	0.732	2918 (1837; 4636)
MPA frequency	0.66	0.199	4.47 (2.88: 6.94)
MPA duration	35.78	0.288	12776 (9216; 17711)
VPA frequency	0.52	0.661	2.92 (2.13; 4.01)
VPA duration	14.85	0.757	560 (283; 1110)
ST on a weekday	27.61	0.953	6826 (4399; 10592)
ST on a weekend	33.81	0.847	10491 (6764; 16272)
Regular PA	1.04	0.508	n/a
Regular PA frequency	0.39	0.015	1.34 (0.86; 2.08)
Regular PA duration	5.99	0.297	198 (114; 344)
Height	0.01	0.372	0.01 (0.00; 001)
Weight	0.35	0.645	0.84 (0.54; 1.31)
Waist circumference	2.48	0.001	18.19 (8.07;41.02)

[a]Adjusted for sex, age and education level; n/a = not applicable; PA = physical activity; MPA = moderate physical activity; VPA = vigorous physical activity; ST = sitting time.

Program participants. There was current validity in most of the effectiveness markers. Still, the frequency of cooked vegetable consumption, method of preparing animal meat, frequency of physical activity, and waist circumference differed. It is important to highlight that this assessment validation was necessary also to consider the containment measures of the COVID-19 pandemic, in which social distancing was important.

From a larger perspective, other health studies used telephone data collection with similar markers to those reported in the present study[7]. When considering health promotion programs, data collection via telephone was also adopted in other countries such as Australia[10], the United States[11], and Canada[12]. It is also possible to identify that the telephone calls were considered for conducting a whole intervention[10], to be a resource only in the maintenance collection[11], or even as an alternative for the collection of data also performed with another help[12].

It should be noted that study participants prefer online or paper-based health research methods rather than those by telephone[13]. However, strategies with the telephone, which aimed to reduce costs, are a trend in the health area[14]. Additionally, in the context of the COVID-19 pandemic, conventional methods to obtain behavioral data from people, such as by applying face-to-face questionnaires, were not feasible. The limitation of internet access and literacy with online technics was considered as difficult in some contexts.

In the present study, differences were identified between the collection formats depending on the nature of the measurement (marker). The food frequency variables seem to have a trend of more positive responses in the telephone collection. Regarding the practice of physical activity, there seems to be a tendency to overestimate the days of regular exercise in the data collection carried out by telephone compared to the version applied on paper. The body measurements indicate a variation only in waist circumference, which is the gold standard for a health professional. Finally, in the variables of perception of health and quality of life, telephone collection indicated a slight tendency for responses with worse perceptions to be reported. This finding differs from a previous study, which showed better mental health scores in telephone collection[15].

Some strong points could be highlighted. Previously validated instruments[7] were considered to assess the effectiveness of the VAMOS program. The time interval between collections carried out by telephone and on paper respected the instrument references (five days), which may reduce the bias of possible behavioral change of the participants. Although the sample had similar sociodemographic characteristics to the eligible participants, adjusted models were also used to minimize potential confounding variables. Despite existing restrictions, given social distancing measures resulting from the COVID-19 pandemic, there was a careful transition from the method to the continuity of the research. The evaluation of maintenance through data collection by telephone provided the opportunity to develop complementary strategies for assessing par-

ticipants in the VAMOS Program, which could serve as a model for other strategies in primary health care.

Some limitations should be considered when proposing an innovation for behavior change programs in the Brazilian scenario. First, the participants already knew the instrument, with the third collection using the same tool (previously with the pre-and post-intervention collection). In this way, the instruments may be potentially an alternative for monitoring the participants for the follow-up. Still, studies intending to collect data by telephone before the intervention may consider additional data from those participants involved. Second, the sample size and the convenience choice reduce the generalizability of the findings. However, eligible participants were only different in age from the reference sample, a variable considered in the adopted statistical models for estimating validity. A third point to be considered in interpreting the data is the person responsible for conducting the collections. The telephone collection was under the responsibility of the researchers involved with the Physical Education field, while the paper collections relied on health professionals with different backgrounds. However, the training offered to health professionals can contribute to reducing this bias.

We concluded that in a behavior change program in primary care, concurrent validity was found between the data collection carried out by paper and by telephone. Thus, it will be possible to conclude the maintenance data collection in the VAMOS Program, establishing the methodological quality in the evaluation, as proposed in the implementation.

As future practical applications, monitoring participants in primary health care can be optimized with both resources, providing information on the impact on an individual in the context of public health. Still, it is suggested to carry out other data collection strategies with the use of different technologies, such as tools on smartphones, computers, and tablets.

Conflict of interest

The authors declare no conflict of interest.

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Authors' contributions

Christofoletti M: Conceptualization, methodology, validation, data analysis, investigation, data curation, visualization, writing original draft and approval of the final version of the manuscript. Sandreschi PF: Visualization, writing original draft and approval of the final version of the manuscript. Carvalho HM: Data analysis, supervision, writing review & editing and approval of the final version of the manuscript. Souza CS: Data curation, writing original draft and approval of the final version of the manuscript. Alves CS: Investigation, writing original draft and approval of the final version of the manuscript. Bezerra JB: Investigation, writing review & editing and approval of the final version of the manuscript. Benedetti TRB: Conceptualization, methodology, investigation, supervision, project administration, project administration, writing review & editing and approval of the final version of the manuscript.

Declaration regarding the use of artificial intelligence tools in the article writing process

The manuscript did not use artificial intelligence tools for its preparation.

Availability of research data and other materials

The data of this study is available on demand from referees.

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