



# Factors associated with Physical Activity Counseling by Health Workers Questionnaire: construction, validation and reliability

## Questionário sobre fatores associados para o Aconselhamento para Atividade Física por Trabalhadores da Saúde: construção, validação e reprodutibilidade

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### ABSTRACT

The main purpose of this study is to describe the development, validation and reliability of a questionnaire to measure the associated factors of physical activity counseling by health workers. The development of the questionnaire was carried out in four steps: construction of the analytical matrix; face validation; pilot study; and reliability assessment. The analytical matrix consisted of ten modules with a total of 47 questions. In the second step, 21 Brazilian experts of different knowledge backgrounds gave their opinion on the presentation, clarity and adequacy of each item. In the third step, a pilot study was carried out with 20 professionals (doctors, nurses and community health agents) from the Joao Pessoa, Paraíba Family Health Strategy. In the last step, reliability index was assessed among a sample of 53 health workers from five health units. The final version of the questionnaire was composed of 53 questions distributed in ten modules. Results showed a total validity index of 0.90 ranging from 0.83 to 0.95 in the modules. The clarity and adequacy of the scale showed mean values of 0.93 (ranging from 0.87 to 0.96) and 0.95 (ranging from 0.91 to 0.98), respectively. Eight out of ten modules showed all items with reliability greater than 0.60 (kappa). The questionnaire showed a satisfactory validity and reliability and it is recommended for studies to measure physical activity counseling and other practices in health promotion by health workers in the primary health care.

**Keywords:** Counseling, Motor activity, Validation study, Health personnel.

### RESUMO

*O objetivo deste estudo é descrever o desenvolvimento, validação e reprodutibilidade de um questionário para mensurar fatores associados à prática do aconselhamento para atividade física por trabalhadores de saúde. O desenvolvimento do questionário foi realizado em quatro etapas: construção da matriz analítica; validação de face; estudo piloto; estudo de reprodutibilidade. A primeira etapa resultou numa matriz analítica com dez módulos com um total de 47 questões. Na segunda etapa, 21 brasileiros especialistas em diferentes áreas opinaram sobre a apresentação, clareza e adequação de cada item. Na terceira etapa, foi realizado o estudo piloto com 20 profissionais (médicos, enfermeiros e agentes comunitários de saúde) da Estratégia de Saúde da Família de João Pessoa-PB. Por fim, uma amostra de 53 trabalhadores participou do estudo de reprodutibilidade. A versão final do questionário foi composta de 53 questões distribuídas em dez módulos. Foi encontrado um índice de validade geral de 0,90, variando de 0,81 a 0,95 nos módulos. A clareza e adequação da escala demonstraram valores médios de 0,93 (variando entre 0,87 e 0,96) e 0,95 (variando entre 0,91 e 0,98), respectivamente. Oito dos dez módulos apresentaram todos os itens com valores de reprodutibilidade acima de 0,60 (kappa). O questionário apresentou validade satisfatória e reprodutibilidade adequada, recomendando a sua utilização em estudos que visam avaliar a prática de aconselhamento de atividade física e outras práticas de promoção da saúde por trabalhadores de saúde da atenção primária à saúde.*

**Palavras-chave:** Aconselhamento, Atividade motora, Estudo de validação, Trabalhador da saúde.

## Introduction

Primary health care is organized in Brazil through the Family Health Strategy. It has been considered a privileged context for conducting health and physical activity promotion and disease prevention actions<sup>1,2</sup>.

Among the educational actions developed, counseling is highlighted by the National Health Promotion Policy<sup>3</sup> as one of the approaches to promote population's healthy lifestyles.

Counseling is defined as an active, individualized

and user-centered listening process, which, by establishing a relationship of trust with health workers, aims to enhance the users' internal resources so that they have the possibility of recognizing themselves as subjects of their own health and transformation<sup>4</sup>. Regarding physical activity counseling, it can be understood as a general and structured orientation aimed at encouraging the practice of physical activity, preferably during leisure and commuting<sup>5</sup>.

Physical activity can be addressed by any professional in the Family Health Strategy, but the proportion of health users who reported having been advised to practice physical activity is still low<sup>6,7</sup>. Modifiable factors of socio-organizational and socio-political nature, resources and support, as well as characteristics of workers<sup>8</sup>, may explain why actions such as counseling are not yet widely adopted by health workers in primary care.

There are some factors pointed out by the health professional to explain low adhesion to counseling for physical active practice. Some of them are the perceived barriers (e.g. little knowledge about counseling, not enough advisors, an elevated work demand, no instructional supplies, and user's financial resources) and the psychosocial aspects (e.g. self-efficacy and attitude)<sup>9,10</sup>. Nevertheless, not only the personal perception of the health professional seems to influence adhesion to the physical activity practice counseling. Another study, the authors showed factors like development, implementation and the effect of the use of innovative work process, the organizational and socio-political culture, resources and support and the professional characteristics<sup>8</sup>.

In the literature reviewed, we can find few instruments to measure the factors associated with the physical active practice counseling by health professional<sup>6,11-15</sup>. However, only a few of those instruments tested face and content validity. They did not show simultaneity, reliability and the validity of the questionnaires<sup>11</sup>.

Still, there are those questionnaires designed to attend specific studies, without testing the psychometric validity. Further, most of them measure specific factors of counseling in other countries<sup>11,13,15</sup>, not in Brazil. In this sense, the Brazilian primary health care has specific needs and differences that shall be considered.

The lack of validated Brazilian questionnaires to measure the associated factors of physical activity counseling by health professional was the most important motivation to design this instrument. Thereby, our purpose is to elaborate an instrument to measure per-

sonal factors (knowledge, perceived barriers, attitudes, self-efficacy, life style) and contextual characteristics (initial and continuous training, workload, type of employment). These factors have been associated with the physical activity counseling by health professional<sup>16</sup>. They can contribute with the development of better promotion and intervention programs in counseling integrated with the primary health care work process. Thus, the main purpose of this study is to describe the development, validation and reliability of a questionnaire to measure the associated factors of physical activity counseling by health workers.

## Methods

This is a methodological study with a descriptive approach, that integrates the project "Impact of training with primary health care professionals on the counseling practices for physical activity for SUS users". The instrument presented here was used in the baseline survey of that research, with the participation of 591 health workers, including doctors, nurses and community health agents.

The development of the questionnaire was carried out in four steps: construction of the analytical matrix; face validation; pilot study; and reliability study. The first stage took place from March to October 2016, in eight meetings with the members of the Group of Studies and Research in Epidemiology of Physical Activity (GEPEAF / UFPB), to define the dimensions and indicators that would compose the instrument. The analytical matrix was based on previous studies carried out with health workers of the Family Health Strategy<sup>8,15,17</sup> and pre-existing instruments<sup>7,18</sup>. The following content were listed: counseling practice; competencies to carry out counseling (knowledge, skills and attitudes); sociocognitive dimension (measure of self-efficacy); individual characteristics and behaviors (nutritional status, physical activity level); occupation (type of employment relationship and workload); initial and continuing training; and sociodemographic characteristics. Ten modules were defined for the instrument that included a total of 47 questions in its first version.

Forty experts in physical activity, collective health, epidemiology were intentionally selected. They are recognized for their professional and practice expertise in the primary health care and construction and validation of questionnaires. First of all, we sent an invitation letter, by e-mail, explaining the purpose of the study

and asking for the possibility to take part in the content and face validity of the questionnaire. Nineteen experts took part in this phase. After that, two more experts were included in the study, both were recommended by the first experts. The final sample was constituted by twenty-one experts. To assess questionnaire validity, the experts used a Likert scale with possible answers from 0 to 10, divided into three levels: not valid (0 to 3 points), poor validity (4 to 7 points), and valid (7 to 10 points), and an open field for suggestions and comments. Sixteen experts returned the questionnaires with the evaluations of the first round, adding six new questions to the instrument. The validity index was calculated from the sum of the points attributed by the specialists to the items of the questions, divided by the number of items in the instrument and then divided by  $10^{19}$ .

A second evaluation round was conducted for the revised version of the questionnaire. In order to assess clarity, experts used a Likert scale with the following categories: 0 to 3 (not comprehensible), 4 to 7 (poorly understood) and 8 to 10 (understandable); and the adequacy of the response scales, based on a 10-point Likert scale (0 to 3: not adequate; 4 to 7: poorly adequate, and 8 to 10: adequate)<sup>20</sup>.

In the third step, a pilot study was carried out with 20 professionals (doctors, nurses and community health agents) intentionally selected from two health units of the Family Health Strategy of Joao Pessoa, Paraíba. After the pilot study and corrections, the last version of the instrument was concluded. Also, a letter explaining the corrections made in the instrument was sent to the experts.

Reliability levels were analyzed in a probabilistic sample of the target population, that is, health workers (doctors, nurses and community health agents) from the Family Health Strategy of Joao Pessoa-PB. To calculate the sample size, an expected kappa index  $\geq 0.40$ , a type I error of 5%, a type II error of 20% and a 20% increase were considered to compensate for losses and refusals. This resulted in an estimated sample of 60 professionals, distributed as follows: five doctors, five nurses, five nursing technicians and 45 community health workers. Five out of 105 Basic Health Units were randomly selected, one from each of the five health districts. Permanent and temporary employees of the Municipal Health Services were included. As an inclusion criterion they should be working at a minimum of three months in the health service and were excluded those retired, on vacation, with medical leave

or any other reason they should leave the study during the data collection.

The questionnaire was self-completed by health professionals in two moments, with an interval of 48 hours, during working hours in health units. Researchers were available to solve any participant's doubts. All data were stored and organized using the EpiData 3.1 software, with double-entry and automatic checking of the value's consistency and amplitude. Also, the data were analyzed using Stata 13.0. Quantitative data were presented by mean and standard deviation. Qualitative data were presented by relative and absolute frequency distribution. Reliability were calculated by the Kappa coefficient (K).

This study was approved by the Ethics Committee for Research with Human Beings at the Federal University of Paraíba, addressing all ethical procedures of the National Health Council (Protocol No. 0349/16. CAAE: 5678016.5.0000.5188). All participants signed the free and informed consent form and were informed about the research objectives and procedures.

## Results

The final version of the questionnaire was composed of 53 questions distributed in 10 modules. The modules, measures used, and validity index are briefly described in Chart 1. The instrument obtained a total validity index of 0.91, ranging from 0.81 in the job demand module to 0.96 in the physical activity module.

The clarity and adequacy of the scale showed mean values of 0.93 (ranging from 0.87 to 0.96) and 0.95 (ranging from 0.91 to 0.98), respectively (data not shown). In addition to the scale assessment, minor adjustments to the text format were made according to the experts' suggestions. Also, minor changes were made in questions wording after pilot tests.

Fifty-three professionals (88.3%) out of 60 health workers participated in the study of reliability (3 refuses, 3 were not found on at least three visits from the data collection team and 1 was excluded because they did not meet the inclusion criteria). The majority were female (77.4%), with gross income of up to two minimum wages (77.4%), white skin (66.0%) and works for five years or more in the Family Health Strategy (92.5%) (Table 1). Table 2 shows the average reliability values per module. Nine out of ten modules showed an average reliability above 0.60. The self-efficacy module to perform counseling for physical activity had the lowest index ( $k = 0.44$ ). In the module of general

**Chart 1** – Description of the instrument regarding the modules, number of items, measures used and the questionnaire’s validity index.

Module	Measures	AVI*
Physical activity	Frequency (days / week) and duration (min / day) of PA practices in the last week, based on a list of 19 activities, with the possibility of adding five more. PA level was defined by the sum of the products of time and frequency (minutes per week).	0.96
General knowledge	Perceived knowledge about recommendations for PA, concepts of PA, physical exercise and sedentary activity, benefits of PA and approaches and tools to promote PA in Primary Health Care. Assessed by a five-point Likert scale (very low to very high). In addition, it has items to measure the level of interest in learning about topics covered in the module, measured by a four-point Likert scale, ranging from 1 “not very interested” to 4 “very interested”.	0.93
Skills	Perceived skill level for the following attributes: 1) counseling for PA; 2) actions to promote PA in conjunction with other health professionals; 3) develop actions to promote PA according to the local reality 4) skills to dialogue with local managers on issues that enhance the performance of actions to promote PA. A Likert scale ranging from “very low” to “very high” was used.	0.94
General information about counseling	Indication of the stage of behavior change in relation to the counseling practice; indication of health professionals who can provide such guidance; and indication of barriers to counseling.	0.95
Attitude	Measured by a scale with five items, in which the degree of importance (ranging from not important = 1 to very important = 4) to offer counseling for the practice of PA must be attributed, for example: in different subgroups of the population (hypertensive, diabetic, obese, elderly and adolescents).	0.83
Self-efficacy	Measured by eight items on a dichotomous scale (yes/no), in which situations potentially unfavorable to the practice of counseling for PA by health professionals are presented.	0.88
Anthropometry, health perception and quality of life	Self-reported measures of body weight and height to identify the nutritional status of professionals. The perception of health and quality of life were self-reported, with the answer options: bad, fair, good, very good, excellent.	0.87
Job demands	It included questions about working time, type of job contract, number of daily consultations, hours worked, and number of job contracts.	0.81
Initial and continuing education	Information on academic training and continuing qualification. Permanent education was evaluated by participation in some program or academic activity related to professional intervention in Primary Care, as well as in training courses, receiving support from the Family Health Support Center (NASF) on the topic of physical activity and health and in graduate activities. In addition, there was a level of interest in learning about the topic of physical activity in Primary Health Care and a factor (s) that could prevent or hinder their participation in training.	0.91
Sociodemographics	In order to characterize health professionals, it was questioned about sociodemographic aspects: sex, age, professional category, education, income, marital status, skin color.	0.90
Total average validity index		0.90

\*Average validity index (AVI); PA = Physical activity.

information about counseling, the question about the stages of behavior change in relation to the counseling practice showed an excellent level of reliability ( $\kappa = 0.92$ ). The perception of barriers presented a good index ( $\kappa = 0.72$ ). Finally, the reliability of the question about the adequacy of health professionals who can provide such guidance showed a poor level of agreement ( $\kappa = 0.25$ ).

## Discussion

The results of the study demonstrate satisfactory validity and reliability of a questionnaire to evaluate counseling and other physical activity promotion competences by primary care health workers. The questionnaire also includes potential correlates that may improve knowledge about barriers and facilitators of physical activity promotion practices conducted in the context of primary care.

There are different factors that potentially constitute barriers or facilitators for primary care health professionals to carry out counseling and other actions to promote physical activity in the daily life of individuals<sup>8,15</sup>. These factors were operationalized in the questionnaire through questions related to individual characteristics, professional performance, training and skills on the subject of physical activity. The experts’ analysis indicated high values for face validity in all items, as well as for the clarity of questions and its scales adequacy. The reliability analysis indicated satisfactory results for most items of the questionnaire. In addition, the care in carrying out the pilot study allowed the necessary adjustments to be made to the instrument, as well as the choice of the best way for its administration.

One of the variables of greatest interest was the practice of counseling by health workers. The choice for a scale based on the stages of behavior change for

**Table 1** – Sociodemographic characteristics of Family Health Strategy workers, Joao Pessoa, Paraíba, 2017 (n = 53).

Variables	Health workers								All	
	Doctors		Nurses		Nurse assistant		CHW		n	%
	n	%	n	%	n	%	n	%		
Sex										
Female	4	33.3	6	100.0	5	16.7	28	80.0	41	77.4
Male	2	66.7	-	-	1	83.3	7	20.0	12	22.6
Age (years)										
20 – 39	3	50.0	3	50.0	2	33.4	11	31.5	19	35.9
39 – 40	2	33.3	2	33.3	2	33.3	16	45.7	22	41.5
≤ 50	1	16.7	1	16.7	2	33.3	8	22.8	12	22.6
Education										
With undergraduate level	6	100.0	6	100.0	4	66.7	22	62.9	22	41.5
Without undergraduate level					2	33.3	13	37.1	31	58.5
Gross income (minimum wages)										
1 - 2					6	100.0	35	100	41	77.4
3 - 4			6	100.0					6	11.3
≥ 5	6	100.0							6	11.3
Skin color										
White	5	83.4	3	50.0	5	83.4	22	62.9	35	66.0
Non-white	1	16.6	3	50.0	1	16.6	13	37.1	18	34.0
Time working at FHS (years)										
< 5					4	66.7			4	7.5
≥ 5	6	100.0	6	100.0	2	33.3	35	100.0	48	92.5

CHW = Community Health Agent; FHS = Family Health Strategy.

**Table 2** – Reliability analysis of a questionnaire to evaluate counseling and other physical activity promotion competences by Family Health Strategy workers from João Pessoa, Paraíba, 2017 (n = 53).

Variables	Item	Test and re-test	% items with satisfactory reliability (Kappa =>.60)
		Average (Range)	
Physical activity	01	0.72 (0.62 - 0.830)	100.0
General knowledge	11	0.71 (0.61 - 0.82)	100.0
Skills	04	0.69 (0.62 - 0.72)	100.0
General information about counseling	03	0.63 (0.25 - 0.92)	66.6
Attitudes	05	0.61 (0.53 - 0.76)	100.0
Self-efficacy	08	0.44 (0.18- 0.63)	62.5
Anthropometry, health perception and quality of life	04	0.82 (0.55 - 0.94)	100.0
Job demands	08	0.93 (0.73 - 1.00)	100.0
Initial and continuing education	08	0.72 (0.55 - 0.87)	100.0
Sociodemographics	07	0.97 (0.87 - 1.00)	100.0

counseling practices was due to the intention to use the instrument, that is, to verify the effect of training interventions with health workers. Thus, the option adopted has advantages when compared to questions with dichotomous response options (*eg.* advise vs not advise), since educational interventions can consider

the stages of motivation of the worker to change behavior in the context of work. The use of the Stages of Behavior Change in physical activity counseling can be considered an important tool for interventions in the health units. In other words, for each behavior a specific strategy is applied<sup>21</sup>.

Other variables we highlight correspond to professional competencies to act with counseling and other health promotion practices, operationalized here by the model of Durand<sup>22</sup>, which articulates the dimensions of skill, knowledge and attitudes. We chose to evaluate the personal perception of competence, since it represents the attempt to describe the individual's perception of the effectiveness of his adaptation to the environment<sup>23</sup>, being relevant, therefore, to structure possible permanent education interventions.

The self-efficacy module for counseling was included due to the premise of the existence of professionals who are able to maintain counseling even when facing challenging circumstances. It is based on Bandura's Social Cognitive Theory<sup>15</sup>, and refers to the belief in the individual's own ability to organize and execute actions necessary to achieve certain goals. The perception of being prepared to advise was associated with regular counseling for physical activity among SUS workers<sup>14</sup>, and interventions aimed at minimizing barriers can potentially contribute to increasing the perception of self-efficacy for counseling. The reliability analysis of this module indicated low values for three out of eight questions. We believe that by requiring the respondent's ability of abstraction – "*I would be able to provide counseling for physical activity to users of the Basic Health Unit even though ...*" – these results could be related to the low level of education of most community health agents. In this sense, when running a stratified analysis by professional formation (graduation vs. high school/technician) we found better reliability levels in professionals with graduation courses (0.70) for all self-efficacy variables.

The option to include individual characteristics of professionals, such as nutritional status, perception of quality of life, health status and level of physical activity, is due to the preliminary evidence that these variables are associated with counseling for physical activity<sup>24-27</sup>.

Also, important contextual variables such as type of work contract, workload, initial and continuing training of professionals were considered in the instrument. It is known that such variables affect health care practices<sup>27,22</sup> because they directly influence the daily work of these professionals. For example, Patra et al.<sup>28</sup> found that physicians who attended up to 30 patients daily were five times more likely to provide physical activity counseling compared to their peers with the highest number of daily visits. Investigations of these factors can contribute to the discussion on the organization

of health services, as well as promoting debates about the adequacy of initial and permanent training to address physical activity in primary health care. Although physical activity counseling can be a valuable tool against chronic diseases and physical inactivity, low cost and effectiveness<sup>2</sup>, it is not either unique nor most important strategy. It should be applied with inter and intra sectorial actions in the primary health care.

This study has some limitations that need to be taken into account. Despite being random, the sample was constituted, for logistical reasons, only by health professionals from the minimum team (doctors, nurses, nursing assistants and community health agents) who work in the Family Health Strategy in the city of João Pessoa-PB. In addition, confirmatory factor analysis was not used to test for convergent validity of the instrument. However, the instrument showed good indexes of face validity and reliability.

On the other hand, it is noteworthy that this study is one of the first, if not the first, to verify the validity of a counseling assessment questionnaire for physical activity by primary health care health professionals. The validation of this instrument makes it possible to assess factors associated with the practice of counseling by health professionals, and in the development of intervention strategies that focus on promoting physical activity in Primary Health Care (PHC). In addition, the questionnaire could simultaneously measure different factors associated with the practice of counseling (aspects related to counseling, attitude, self-efficacy, individual characteristics and behaviors, occupation, initial and continuing training; and sociodemographic characteristics). Another advantage of this instrument is that it is capable of covering any understanding by the health professional of what physical activity counseling is.

The developed questionnaire showed satisfactory indexes of validity and reproducibility and can be used in the study on counseling practices and their correlated factors among primary health care professionals in Brazil. The better knowledge of these practices and their related factors can favor the discussion about the approach of the activity theme in the routine of primary care. In addition, the questionnaire has some advantages as it measures different associated factors of counseling (e.g. attitude, self-efficacy, characteristics and individual behavior, occupation, initial and continuing training). Also noteworthy is its ease of application and completion by health professionals.

To conclude, the questionnaire presents good valid-

ity and reliability index and can be used in any study about physical activity counseling and associated factors by primary health care workers in Brazil. A better knowledge of this practices and its associated factors could be a valuable tool to improve physical activity promotion in the primary health care.

### Conflict of interest

The authors declare no conflict of interest.

### Author's contributions

Souza Neto JM participated in the design of the article, data collection and analysis, literature review and writing of the manuscript. Silva SS and Farias Júnior JC participated in data collection, data analysis and writing of the manuscript. Costa FF, participated in all stages of the study, including article design, data collection and analysis and critical review of the manuscript.

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