

Physical Activity Promotion in Primary Health Care in Brazil: A Counseling Model Applied to Community Health Workers

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Background: The aim of this study was to describe a methodology for training to provide counseling on physical activity among community health workers working within primary healthcare in Brazil. **Methods:** This was an intervention study conducted with 65 community health workers in the Ermelino Matarazzo district in the São Paulo, Brazil (30 in intervention group). The intervention group received a course of 12 hours (with 4 meetings of 3 hours each in 1 month) that aimed to improve their knowledge and be autonomous with regard to promoting physical activity. For data analysis, focus groups and questionnaires on knowledge and perceptions regarding physical activity were used. **Results:** The average attendance for the 4 meetings was 29 workers (93% of total). There was an improvement in knowledge on physical activity recommendations in comparison with the control ($P = .03$), and qualitative results revealed that the professionals appreciated the learned content, valued its application based on knowledge construction and felt secure about promoting physical activity. This was seen through high adherence levels and construction collective of proposal for home visits for physical activity promotion. **Conclusion:** The training was effective in improving knowledge and attitudes toward counseling on physical activity among community health workers.

Keywords: health promotion, interventions, methods, public health practice

Counseling on physical activity performed by physicians within primary healthcare has been proven to be effective in promoting physical activity among adults in high-income countries.^{1,2} However, there are still very few studies in middle-income countries with populations living in regions of low socioeconomic level where midlevel professionals work within primary healthcare. The Brazilian National Unified Health System was introduced in 1990 and is the largest healthcare policy ever implemented in Brazil. Its main objectives are to promote health and prevent disease.³ In 1994, the family health strategy was established as one of the policies of this system, based on collective attendance for families within an environmental context with territorial boundaries. It is provided by teams consisting of family physicians, nurses, nursing assistants and community health workers. These multiprofessional teams attend to registered families whose homes lie within a geographically defined area containing a primary care unit that serves as a reference point for the teams and for the people who are served by the system.^{3,4} Each team consists of a physician, a nurse, 2 nursing assistants and 6 community health workers, who attend around 1000 families or 4000 people. Community health workers are professionals who form a link between the healthcare team and people living in the area served, and they make home visits at least once a month to gather health information and implement health promotion actions.^{3,4} International studies have shown that training courses on physical activity counseling for physicians and nurses working in primary healthcare in high-income countries are effective. Nonetheless, although the family health strategy was a step forward for the public health care sector in Brazil, few strategies for professional training relating to

physical activity counseling have been implemented, especially among professionals such as community health workers. One of the first studies in Brazil with the aim of training community health workers to perform counseling on physical activity was conducted by Gomes et al.⁵ However, this methodological proposal has evolved toward greater autonomy, through working with active learning methodologies and integrating models for promoting individual and collective physical activity. This may be a replicable model in countries that have a health system with characteristics similar to the Brazilian system. Moreover, promotion of physical activity is an important strategy for health promotion that can be incorporated into the family health strategy. In this light, the objective of the current study was to describe a methodology for training to provide counseling in relation to physical activity among community health workers working within primary healthcare in Brazil.

Methods

Design

This study forms part of a set of interventions called “Active Environment,” which have the aim of testing methodologies for promoting physical activity that can be implemented within the National Unified Health System through the family health strategy. Further details on the set of strategies can be obtained on the webpage www.each.usp.br/ambienteativo.

The interventions were carried out in the Ermelino Matarazzo district of the municipality of São Paulo, Brazil. Ermelino Matarazzo is located in the eastern zone of São Paulo, which is the most heavily populated region of the city, with more than 4 million residents, and has the city’s greatest inequalities relating to socioeconomic level. The average human development index (HDI) of the 21 districts that make up the eastern zone is 0.790, which is lower than the overall HDI for São Paulo (HDI = 0.841).

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The HDI of Ermelino Matarazzo is in 72nd position among the 96 districts of the municipality of São Paulo. According to 2010 data from the Brazilian Institute of Geography and Statistics (IBGE), Ermelino Matarazzo and its municipal government has an area of 8.70 km² and 113,615 residents, with a population density of approximately 13,059 residents/km². Regarding the healthcare system, the Ermelino Matarazzo district has 3 primary healthcare units that provide attendance through the family health strategy and perform primary medical care, covering around 55,000 people or 48% of the total population of the district. To develop this study, 2 healthcare units were chosen according to convenience: one as an intervention unit and the other as a control unit.

Sample of Community Health Workers

Six teams at the intervention healthcare unit and 7 teams at the control healthcare unit were active in the region in January 2011. During the sample selection period, both units had 5 community health workers in each team. Therefore, there were 30 eligible agents in the intervention healthcare unit and 35 agents in the healthcare professionals that served as the control. The 2 healthcare professionals are located in different areas and there is usually no contact between the units or their respective community health workers.

Theoretical Models for the Intervention

The theoretical reference points for the course were the ecological model for promoting physical activities at the community level,⁶ the transtheoretical model for behavioral change applied to physical activity⁷⁻⁹ and Paulo Freire's pedagogy.¹⁰

The ecological model for promoting physical activity is composed of variables that form part of people's everyday lives, which influence physical activity practices and are divided into hierarchical levels. The first level groups individual and personal variables; the second, variables of perception of the environment; the third, variables of the constructed environment; and the final, public policy variables.⁶ The justification for using the ecological model for promoting physical activity was that initially the interventions were based on results from epidemiological studies conducted among adults and elderly people in the region. These studies had the objective of investigating the environmental variables that were associated with physical activity.^{11,12}

The transtheoretical model aims to integrate concepts and principles of different theories of behavioral change and psychotherapy through 5 major groups of constructs:

1. Stages of change (these represent a temporal dimension, given that the change unfolds over time, going through a series of 6 stages, generally in a nonlinear manner)
2. Change processes (strategies and actions used to progress through the stages)
3. Decision balance (this reflects the relative weights of the pros and cons of the change for the individual)
4. Self-efficacy (confidence that an individual is able to deal with high-risk situations without falling back into his previous behavior)
5. Temptation (inverse of self-efficacy, reflecting the intensity of the impulse not to engage in the new behavior when in difficult situations).⁷⁻⁹

The transtheoretical model was used at the individual level because the aim was to train community health workers so that they

would contribute toward behavioral change relating to practicing physical activity, among users of the healthcare system.

Paulo Freire's pedagogy was used to stimulate development of critical awareness among the community health workers regarding the subject of physical activity promotion. It was also used for the choice of topics for discussion and development at meetings in which the starting point was analyses on the professionals' real situation and problem-solving based on their day-to-day scenario.

This method has been widely used in studies and interventions in the field of health promotion, both in proposals for interventions in communities and groups,^{13,14} and in programs for lifelong professional education and training.¹⁵ One of the assumptions of Paulo Freire's pedagogy lies in the idea that no one educates anyone alone and no one is educated alone. Education should be a collective act performed in a spirit of solidarity and love, which is organized by people who are interested in other people's development.¹⁰ Here, it should be noted that there is a strong premise that the taught content and the motives for the act of educating arise from attentive and careful observation of day-to-day life and culture. In the same way, it is considered that any educational act cannot be imposed, since education consists of a constant task of exchanges between people, and dialogue between the knowledge of those giving and receiving the education. According to Paulo Freire, education as a practice of development of critical conscience becomes possible through education involving dialogue and problem-setting.^{10,13-15} For these reasons, the pedagogical practice adopted for the course was mediated by dialogue between the educators and the workers, with constant stimulation of exchanges of day-to-day experiences. The workers' knowledge was sought and was then used for setting problems and for discussion. Based on these discussions, the educators organized the educational practices with the aim of always having participation and critical reflection through dialogue. Beyond the teaching material content, Freire's idea of education for stimulating the critical and reflective conscience was adopted

Course Model Description

Firstly, a pilot study was conducted using an initial proposal for the course. This was tested on a group of physicians, nurses, nursing technicians and community health workers. These were all family health professionals working within family health at a primary healthcare unit in the eastern zone of São Paulo, but outside of the Ermelino Matarazzo district.¹⁶ From the results of this study, a new version of the training course for promotion of physical activity was developed (Table 1). This course had a total duration of 12 hours, with 4 meetings of 3 hours each that were conducted once a week within working hours, in the mornings. The content of the course aimed to train community health workers to improve their knowledge and be autonomous with regard to promoting physical activity. It also served to make the professionals responsible for their own process of change and learning, thus empowering them to change their health and, ultimately, to promote physical activity in their community.

Educational support material (folders) regarding the concept of physical activity, how to practice physical activity autonomously, venues available for practicing these activities in the neighborhood and how to deal with barriers that impede physical activity practice was devised.

The course was run by a team of Physical Education professionals and researchers. One of the Physical Education professional that ran the course was also a National Unified Health System/Family Health Strategy professional of another region of São Paulo city and had vast experience with the routine work of community health workers.

Table 1 Description of the Themes of the Meetings Within the Course to Promote Physical Activity for Community Health Agents, São Paulo, SP, Brazil, 2011

Description of the meetings
<i>First meeting: Physical activity, health and self-care</i>
Objectives: To present the intervention; assess sociodemographic data and knowledge about the professionals' physical activity and health; to conceptualize and characterize physical activity and health promotion; to discuss the recommendations for physical activity for health and their importance for self-care; to characterize the population of Ermelino Matarazzo regarding physical activity practice; and to explore the types of physical activity most practiced and other types that can be incorporated.
<i>Second meeting: Overcoming barriers to physical activity practice</i>
Objectives: To explore the personal and environmental barriers that hinder physical activity; to understand the individual barriers that people living in the district report to healthcare professionals; to reflect on institutional, organizational and work-related barriers; to reflect on the environmental barriers; to explore the personal difficulties relating to work, such as dealing with working together; to explore the results from the Ermelino Matarazzo population; and to define goals and objectives for practicing physical activity.
<i>Third meeting: Collective construction of the content for home visits to promote physical activity</i>
Objective: To build and collectively share the possibilities and feasible strategies to be broached and applied during home visits.
<i>Fourth meeting: Collective construction of the content for home visits to promote physical activity</i>
Objective: To build and collectively share the possibilities and feasible strategies to be broached and applied during home visits.
<i>Final assessment: Repeat application of questionnaires on physical activity and health, and discussion on the course provided.</i>
<i>Handover of certificates with end-of-course celebration</i>
<i>Focus group for evaluating the course</i>

Assessments of Knowledge and Perceptions regarding Physical Activity

To evaluate the community health workers' knowledge and perceptions regarding physical activity, a questionnaire divided into 5 sections was used. These sections addressed the following: information about sources of knowledge on the topic of physical activity and health (television programs, newspaper and magazine articles, lectures or courses); knowledge about the benefits of physical activity for health; knowledge about the current recommendations for practicing physical activity for health; values attributed to promotion of physical activity and guidance on physical activity and health for users; professional data such as length of time working at the healthcare unit and whether the individual was organizing or participating in any physical activity groups at the healthcare unit where this person was working. This questionnaire had been used in a previous study by Sá and Florindo.¹⁶

Another strategy used to evaluate the professionals' knowledge, as well as their expectations and impressions about the course, was to convene a focus group. Two focus groups were convened, with the first held after the course ($n = 15$) and the second held after a process of home visits for physical activity promotion with based course ($n = 8$). The information from the first meeting was key to organizing and devising the educational strategies whereas data from the second meeting was important for appraising the course. It was led by a professional who was experienced in using the technique and conducting qualitative interviews and who did not have any involvement with the course or with organizing and conducting activities with the agents. An observer who was known by the group also participated, to assist in organizing the speech and narrative. Questions for the focus group were formulated based on categories. In the first focus group, questions were based on 3 main themes: 1) Relations of physical activity with everyday life, beliefs and values regarding the practice of physical activities; 2) knowledge on the practice of physical activities; and 3) expectations concerning the course. In the second focus group, held after the course, 2 of the same themes (1,2) were used and the third was replaced with 3) positive and negative appraisals of the course. All the groups were

held in quiet settings without outside interference, with all participants seated around a table. All conversations were recorded by a digital recorder switched on after mutual consent of all participants.

Analysis

The questionnaires on knowledge and perceptions regarding physical activity and health were applied before and immediately after the course, to the group at the unit that received the intervention. For the control group, the questionnaires were applied only once (around the same time as the questionnaire that was applied to the unit that received the intervention after completion of the course). Ten scores were calculated regarding knowledge, perception and importance of health-related physical activity: 1) Access to information; 2) Knowledge about the benefits; 3) Perception of the benefits; 4) Importance; 5) Knowledge of the recommendations; 6) Knowledge of the volume (number of days per week); 7) Knowledge of the combination of intensity (moderate or vigorous); 8) Importance of muscle strength exercises; 9) Activities for special groups; and 10) Differentiation of concepts.

The data were described using means and standard deviations, for the intervention and control groups. The mean differences in the scores from the knowledge questionnaire on physical activity were analyzed before and after the course for the group of professionals who received the intervention. These analyses were done using Student's *t* test for dependent samples or the equivalent nonparametric Wilcoxon test. To compare the proportions of changes in knowledge from before to after the course in the intervention group, the McNemar test and the marginal homogeneity test were used. To compare the mean scores for knowledge after the course between the intervention and control groups, Student's *t* test for independent samples or the equivalent nonparametric Mann-Whitney test was used. To compare proportions between the intervention and control groups, Fisher's exact test and the chi-square test were used. All the data were analyzed using the SPSS software, version 15.0.

For focus group analyses, the content analysis strategy was adopted involving the following stages: a) transcription of speech, b) exhaustive reading of statements, and c) indexing and categorizing

of data based on highlighted recurrent patterns for responses and comments on each question.^{17,18}

Ethical Issues

The project was approved by the Ethics Committee of the Municipal Health Department of São Paulo on September 8, 2010 (protocol no. CAEE 0072.0162.000 to 10). It was registered in the Brazilian Registry for Clinical Trials and in the Clinical Trials Database NCT01857648.

Results

All the community health workers working in the unit where the course was promoted agreed to participate in the study (30 workers). However, in the control group healthcare unit, only 23 agreed to answer the questionnaires (65.7% of all the community health workers in this healthcare unit). Regarding the characteristics of the groups, all the participants were women and there were no significant differences between the intervention and control groups in relation to age, number of years of schooling and number of years of service at the healthcare unit (Table 2).

On average, 29 community health workers attended the course at each meeting, and the attendance rate for the 4 meetings was greater than or equal to 93%.

The first result from the 4 meetings of the course and in at least 1 home visit conducted for community health workers during the training was collective construction of a home visit model for promoting physical activity based on the stage of behavioral change relating to practicing physical activity (Figure 1).

The quantitative evaluation of knowledge and perceptions of physical activity and health (Table 3) showed that there were improvements in the scores for access to information and knowledge about physical activity. Moreover, there were improvements in the professionals' perceptions regarding the benefits from and the recommendations of physical activity for health. The number of correct answers regarding the weekly frequency of physical activity for health increased. So too did the knowledge that this could be done in cumulated periods or continuously and the knowledge of physical activity and its different domains (leisure, work, domestic and transport).

Comparison with the control group after completion of the course (Table 3) showed that the group of community health workers who attended the course had better performance regarding knowledge and recommendations relating to physical activity, both in the weekly and in the daily recommendations. Moreover, it was seen that physical activity could be done continuously or through accumulated periods of the day. In addition, the group of community health workers who attended the course had better performance in terms of knowledge of physical activities for special cases, such as patients with cardiovascular, metabolic and bone diseases.

Table 2 Mean Values for Age, Number of Years of Schooling, and Length of Service of the Community Health Workers

Variables	Total			Control			Intervention			P*
	n	Mean	SD	n	Mean	SD	n	Mean	SD	
Age (years)	53	37.6	8.1	23	36.0	7.0	30	38.8	8.8	0.27
Schooling (years)	53	11.0	1.1	23	11.2	0.9	30	10.9	1.2	0.56
Length of service (years)	53	3.8	3.0	23	3.9	3.3	30	3.7	2.9	0.93

* Values of mean differences.

Abbreviations: SD, standard deviation.

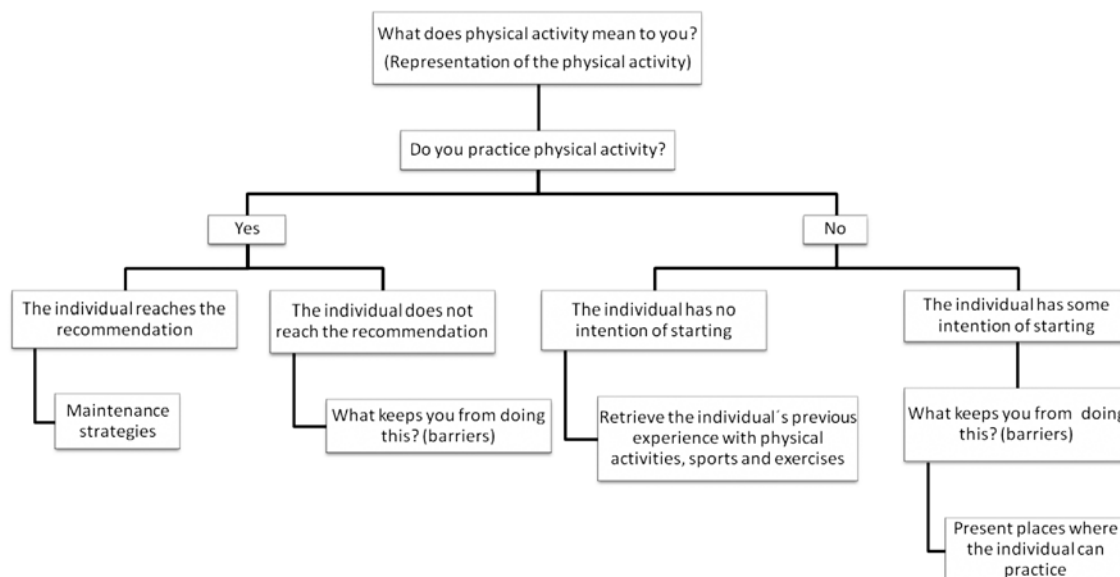


Figure 1 — Model for home visits for physical activity promotion.

Table 3 Knowledge on Physical Activity (PA) Among the Community Health Workers Before and After Training and Comparison With Control Group

Variables	Intervention		Control
	Before	After	
Score for access to information about PA (mean, SD)	8.1 (2.2)	9.3 (2.1)*	8.5 (1.9)
Score for knowledge about benefits of PA (mean, SD)	9.3 (1.1)	9.7 (0.9) ^a	9.6 (0.7)
Individual's perception of knowledge about the benefits of PA (n, %)			
Knows enough	1 (3.6)	7 (25.0)	4 (17.4)
Would like to learn more	23 (82.1)	20 (71.4) ^b	19 (82.6)
Insufficient	4 (14.3)	1 (3.6)	—
Individual's perception of importance of PA for healthy aging (n, %)			
Not important or low importance	—	—	—
Important	7 (25.0)	2 (7.1)	6 (26.1)
Very important	21 (75.0)	26 (92.9)	17 (73.9)
Individual's perception of knowledge about the recommendations for PA (n, %)			
Knows enough	—	7 (25.0)	2 (9.5)
Would like to learn more	23 (82.1)	19 (67.9) ^b	18 (85.7)
Insufficient	5 (17.9)	2 (7.1)	1 (4.8)
Correct answers regarding recommended volume of moderate PA (n, %)			
5 days-week ⁻¹	5 (17.9)	12 (42.9) ^c	4 (20.0)
30 minutes-day ⁻¹	13 (46.4)	19 (70.4)	7 (35.3)**
30 minutes-day ⁻¹ and 5 days-week ⁻¹	3 (10.7)	9 (33.3)	1 (5.0)***
Either continuously or at accumulated periods of the day	9 (32.1)	26 (92.9) ^c	5 (25.0)**
Correct answers about combination of moderate and vigorous PA (n, %)	10 (35.7)	19 (67.9) ^c	10 (47.6)
Correct answers regarding the importance of strength training for health (n, %)	20 (71.4)	23 (82.1)	14 (66.7)
Score for knowledge about PA in special cases (mean, SD)	4.0 (1.5)	4.5 (1.1)	3.5 (1.5)
Correct answers regarding differentiation of concepts relating to PA (n, %)	4 (14.3)	18 (64.3) ^c	7 (33.3)

* $P < .01$ for Student's t test for dependent samples; ^a $P < .01$ for Wilcoxon test; ^b $P < .01$ for test of marginal homogeneity (exact); ^c $P < .01$ for McNemar test (exact); ** $P < .01$ for Chi-square test (with Yates correction); *** $P < .01$ for Fisher's exact test.

The results obtained in the first qualitative assessment (Figure 2) revealed that, although the health workers felt promoting physical activity was important, their perspective was restricted to diseases and difficulties running actions that involve physical activity. Therefore, the health workers hoped to improve their knowledge on physical activities through the course, but felt it might be hard to promote physical activity through home visits given the profile of the users attended and the priorities in their current routines. Another problem mentioned was the difficulty users face in practicing physical activity during leisure time, in addition to the lack of health promotion programs for community health workers.

In terms of the main changes identified after the process of home visits (Figure 3), the results showed that the health workers developed a broader perspective of promoting physical activity in the context of health promotion, as well as greater critical awareness of the potential of the work set against the characteristics of the users of the system. Greater interest in the theme and better relating with the personal and professional lives of the workers were developed. One of the main topics raised was the bond formed between course leaders and the health professionals, besides the focus on stimulating the pleasurable aspects of physical activity.

Discussion

The training course for community health workers working in a region of low socioeconomic level, within the Brazilian primary healthcare settings was proven to be feasible. This was seen through the high adherence levels and the construction of a collective proposal for home visits. The results showed an improvement in knowledge on physical activity recommendations and that the workers liked the course, appreciated the learned content, valued its application based on knowledge construction, and that the intervention broadened their knowledge on physical activity promotion, brought professionals closer while fostering cross-disciplined exchange, and revealed they felt secure about promoting physical activity among the healthcare system users.

This methodology is innovative in the literature, because the preparation of the course involved participative pedagogy for its construction, and 2 models were used to promote physical activity: one at individual level and the other at the community level. It arose from an initial study conducted among a variety of healthcare professionals (physicians, nurses, nursing assistants and community health workers) who were working within family health at a healthcare unit in the eastern zone of São Paulo in 2009. The evaluated results were important, especially for the community health workers.¹⁶

Category on relationships of physical activity with everyday life
Physical activity was rarely cited as a pleasurable practice by the health workers who frequently associated it with excessive effort which encroached on everyday activities.
The community health workers reported not practicing leisure-time physical activity owing to commitment to domestic and occupational activities.
Married health workers reported that women have greater difficulties practicing activities during leisure time.
Category of knowledge
The health workers stated that the practice of physical activity is important for disease treatment and prevention.
The health workers reported that the practice of physical activity should be a healthcare measure and implemented in the health system.
The community health workers stated they did not know how to promote physical activities to elderly individuals or people with diseases.
Category of expectations concerning the course
The community health workers stated that the course could be useful for broadening knowledge on the subject and important for health education.
Some workers expressed concern that the course may represent a further work burden on top of the routine duties involved in home visits.
Some workers were concerned about the course obliging them to promote activity among users of the health system.

Figure 2 — Summary of main results of the first focus group.

Other studies have proposed training courses among similar categories of professionals working within family health in Brazil and in populations living in areas of low socioeconomic level in the United States.^{5,19,20} The intervention known as “Salud Para Su Corazon” (Health for Your Heart) was successful in decreasing the risk factors for cardiovascular disease in Hispanic populations living in areas of low socioeconomic level in the United States.^{20–22} This intervention involved principles similar to those developed in the current study, given that it was based on community health workers (ie, professionals living in the same place as where they worked, performing health promotion actions and making families connect with the healthcare settings).^{19,23} The guiding principles for the course were also based on active learning pedagogy, and used both an individual behavioral change model and an ecological model.¹⁹

In Brazil, the only study on training for community health workers relating to promotion of physical activity through counseling that we found was the one by Gomes et al.⁵ However, in the case of this course, physical education professionals with specific university-level training on this topic who were already included in the Brazilian public healthcare settings also made home visits

alongside the community health workers. Thus, the community health workers were not given any autonomy and were not directly trained to conduct counseling. Integrated use of models for promoting physical activity, from the individual to the community level, was not made clear. In the case of the present proposal, community health workers were trained to be autonomous with regard to providing physical activity counseling. The proposal for home visits for counseling was constructed jointly by the professionals and the researchers, and it was sought to integrate the models from the individual level (transtheoretical model) to the community level (ecological model).

Training courses for community health workers, for them to become promoters of health within primary care, has achieved good results in Brazil, when active learning methodologies are taken into account.^{24–27} The potential for community health workers to provide counseling in countries like Brazil is high, because these professionals live in the districts where they work and form the link between the public healthcare system and the community. Today in Brazil, there are more than 240,000 community health workers³ acting in family health teams. It is important to emphasize that educational

Category on relationships of physical activity with everyday life
Regular practice of physical activity was associated looking after and doing something for oneself, particularly for voluntary physical activities.
Category of knowledge
The health workers pointed out that the knowledge developed during the course changed their naïve views about the possibilities and limitations of promoting physical activity. Beliefs about the possibilities and functions of practicing physical activity were changed by the course from a more functionalist to a more integrative and pleasurable perspective. The community health workers reported the practice of physical activity as a self-care strategy beyond concerns only over disease prevention. The community health workers showed deeper knowledge and greater confidence in knowing in what situations they could promote physical activities during home visits. The health workers reported that the practical activities undertaken during the course were pivotal to improving their understanding of the relationships between pleasurable practice and adherence to physical activity.
Category of appraisal of the course
The health workers viewed the educational strategies as positive and noted that becoming close with the course educators helped convince them that the knowledge was relevant to both personal and professional life. The care taken over the course by educators sparked greater interest for practicing physical activity among the workers, adding to the traditional knowledge gained. The health workers stated that the knowledge gained on the course would influence the way they promote physical activity to users of the system. The health workers stated that the health status of users often precludes counselling on the practice of physical activity, especially when there are higher priority issues impacting people's lives such as domestic violence and unemployment.

Figure 3 — Summary of main results of the second focus group.

methods that provide healthcare workers with reflections about the context of their lives are crucial for development of good healthcare practices. Consequently, it is believed that healthcare workers are in a position to critically evaluate what information is more important for given individuals, groups and communities. At the same time, they are capable of choosing the forms of communication and action that are most appropriate for each case. For this reason, it is not enough just to be informed about what measures to take. Fundamentally, and especially in a multicultural country like Brazil, healthcare workers need to be encouraged to develop their autonomy and empowerment. They should also desire this for system users, so that there is a satisfactory impact on decision-making relating to their activities and to caring for people's health. Several studies have shown that continuing education based on Paulo Freire's method

has a positive impact on professionals' actions.^{15,28–30} This seems to be especially important for healthcare workers who deal with populations that contain minorities or include people who are more vulnerable, or furthermore, with communities or groups containing people of low socioeconomic and schooling levels.

The course that was proposed had an initial adherence rate of 100%, with an average attendance of 93% during the meetings. It is important to emphasize that the course was developed during the community health workers working hours and, even though there was supervision from the healthcare unit management, participation was voluntary and the healthcare professionals who were not interested in participating could perform other activities. The fact that the course had been proposed by a team from the university may have contributed toward the adherence rate. Qualitative evaluation

showed evidence that may corroborate these data, thus showing the importance of partnership between universities and primary healthcare service provision. In Brazil, the educational program for physical activity promotion conducted with employees of the Family Health Strategy showed that community health workers were more adherent compared with physicians and nurses.¹⁶

Other studies on higher-level healthcare professionals in other countries have shown lower adherence results. In a study on physicians and nurses working in primary care with people of low socioeconomic level in South Carolina, United States, the initial adherence was 57% (17 physicians out of 30 who were invited to participate and 16 out of 28 nurses).³¹ Another study in the United States, on healthcare professionals researching on primary care in Oklahoma, showed initial adherence of only 30% (9 professionals out of 30 who were invited to participate).³²

The improvement of knowledge took place mainly in relation to the recommendations for physical activity practice for health, which is a very important point for a course that aims to empower professionals to promote physical activity. Furthermore, the professionals who did the course perceived improvements in their access to information on physical activity and health and appropriate social support from the managers responsible for the course. These results were confirmed in the qualitative analysis, in which the importance of improvements in knowledge in the field of physical activity and health was emphasized both from a personal perspective for the community health workers themselves and from a professional perspective of feeling trained to promote physical activity for users. This is an innovative and important topic for the public healthcare system. A study on 29 community health workers conducted in the United States compared the situations before and after the 62 hours of a course. It showed that the professionals improved their skills, such as in relation to basic knowledge on healthcare, care in the community and the healthcare care system in the community, as well as their skills for counseling, such as listening to people, planning a discussion, accepting criticism and encouraging people to express their opinions.¹⁹ Regarding the specific content of physical activity, similar results were found in a study in the Netherlands on a sample of 59 healthcare professionals (physicians, nurses and physiotherapists)³³ and the study on professionals in South Carolina, USA (physicians and nurses).³¹

Although the community health workers felt capable of promoting physical activity, the qualitative evaluation highlighted that greater responsibility and greater depth of responsibility within the field of physical activity and health should remain with physical education professionals. The latter are university-level professionals with extensive training in physical activity who form part of the family health strategy. A similar result was found by Schmid et al³⁴ in a study conducted in Zurich among primary care physicians. After a training program for counseling on physical activity and health, a qualitative analysis on a focus group showed that promotion of physical activity was a broader concept and should be integrated with other structural actions, with specific professionals in the field.

It is noteworthy that the self-care of the health workers was also affected, whereby one of the results of the questionnaire and focus groups after the training was the creation of a period during work time dedicated to self-care and the practice of physical activities for the community health workers. The experiences were guided by a physical education professional present once a week with the aim of providing a space for self-care. All the agents underwent physical and nutritional evaluations as part of the course.

Certain limitations of the current study need to be emphasized. Firstly, it should be noted that the sample size was small for the

quantitative data analyses. Although the study reached the entire population of healthcare workers in the healthcare unit in which the intervention was conducted and 65.7% in the control unit, we do not know whether a larger sample might have discriminated the effects better. In addition, another limitation relates to the control group, which was only evaluated after the training. This prevented greater detail of comparison between the 2 groups, before and after the intervention. Choosing the intervention and control healthcare units according to convenience may also be considered a limitation, but it is again important to emphasize that we evaluated the entire population of community health workers at the intervention unit and 65.7% at the control unit. Lastly, although the quantitative questionnaires were appraised and standardized for application to the community health worker group, these instruments have not yet been validated. Nonetheless, they were composed of questions that were complex for the professionals, such as the recommendations for physical activity practice for health, which reduced this problem.

There was no evaluation on the effectiveness of the training course among healthcare system users. There are still no impact indicators for measuring factors such as how much this course could influence the level of physical activity among healthcare system users. Further assessments and analyses shall be carried out to study the process of home visits for promoting physical activity among users of the health system.

Nevertheless, it was emphasized that application of this course model may be feasible within primary healthcare in other regions of Brazil, as well as in other middle-income countries that have professionals similar to community health workers in their health teams. These professionals were important in reducing infant mortality in the 1980s, especially in northeastern Brazil, and this achievement may be repeatable in relation to the current public health demands, through performing counseling and promoting physical activity within primary healthcare. This may be achieved because not only do they make home visits and link users with the public healthcare system, but they also live in the regions where they work, such that they are well placed to be in close touch with the environment and people's realities.

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