

POLICY INTERVENTION: THE EXPERIENCE OF AGITA SÃO PAULO IN USING “MOBILE MANAGEMENT” OF THE ECOLOGICAL MODEL TO PROMOTE PHYSICAL ACTIVITY

Victor Matsudo, José Guedes, Sandra Matsudo, Douglas Andrade, Timoteo Araujo, Luis Oliveira, Erinaldo Andrade & Marcos Ribeiro

Abstract

In searching for strategies to combat increasing sedentary status of the world's population, several models have been developed. Among those is the Ecological Model proposed by Sallis and Owen in 1997. This model considers intrapersonal, social environment, and natural and constructed physical environmental factors. Intrapersonal factors comprise: demographic; biological; affective; and behavioural aspects. Social environment components include: social climate; supportive behaviours; culture; policies governing incentives; and resources for physical activity. Weather and geography are among the natural physical environment factors, while among the constructed physical environment components we have: information; urbanisation; architecture; transport; and entertainment and recreation infrastructure. Each of these components have been selected as the intervention focus of many programmes, however, to manage different factors of the model at the same time is quite unusual. Thus, the aim of this article is to present how the Agita Sao Paulo Programme has been trying to managing all of these components in a synchronised way, using a mobile approach. In this model, when one component is targetted, a system imbalance occurs.

During the 7 year experience of the Agita São Paulo Programme, strategic partnerships have been developed (currently comprising more than 300 institutions), and 'mobile management' has been implemented to work towards overcoming this imbalance. This model suggests that substantial changes in societal behaviour will not occur unless a comprehensive intervention simultaneously engages different components of the ecological model. For this style of management, the use of strategic partnerships is of utmost importance, since institutions with focus on and experience in one of the determined factors of the model increases the intervention's chance of success.

Introduction

During recent decades, the number of scientific papers on the health benefits of physical activity has increased dramatically, but paradoxically, the level of population physical activity (PA) has declined (Rego, Berardo & Rodrigues, 1990; Vuori, 2001). Despite efforts to promote active living by different authorities and expert groups, including the American College of Sports Medicine (ACSM), Centers for Disease Control and Prevention (CDC) (Pate, Platt, Blair et al, 1995), World Health Organization (WHO), and the International Federation of Sports Medicine (FIMS), indices of sedentary behaviour have not moved in a positive direction (Caspersen, Pereira & Curran, 2000; Pan-Eu, 1999), suggesting that new approaches are necessary to address the problem. It has become increasingly clear that in order to address the problem of health-related physical activity promotion, it is fundamental to combine old paradigms, that limit the development of solutions to specific approaches and personnel, (Killingworth, Earp & Moore, 2003), with newly developed policies and strategies.

This chapter will outline the practical and innovative experiences of the Agita São Paulo Programme (Matsudo, Matsudo, Andrade, Araujo, Oliveira & Andrade, 2002b; Matsudo, Matsudo, Araújo, Andrade, Andrade & Oliveira, 2003a), launched in 1996 with the aim of promoting physical activity in the State of São Paulo, Brazil.

This programme is considered a policy intervention, therefore, this paper will outline the programme framework and give special attention to the 'Mobile Management' approach (Matsudo et al, 2003b), adapted from the Ecological Model of Influences on Physical Activity (Sallis & Owen, 1997).

Definitions

Policy may be defined as a course of action or inaction chosen by public authorities to address a given problem. Further, policy has also been defined as an executive, judicial, legislative or regulatory action taken by national, state, city or local governmental agencies, or non-governmental organisations such as schools or research centers. Finally, health policy has been defined as an organised group of actions (joint action plan), taking into account one or more health aspects (O'Donnell, 1989).

Combining these two definitions and taking into account the experience of the Agita São Paulo programme, in this chapter, policy is defined as "the science and the art of making things happen". That is, an effective policy to promote physical activity is the science and art of obtaining the best outcomes from a group of actions.

Policy framework

A comprehensive policy framework for physical activity promotion was proposed in 2002 by Pratt, Bauman, Puska and Matsudo (2002). It includes six consecutive phases: vision; making the case; defining the problem; solutions; implementation; and evaluation (see Figure 1).

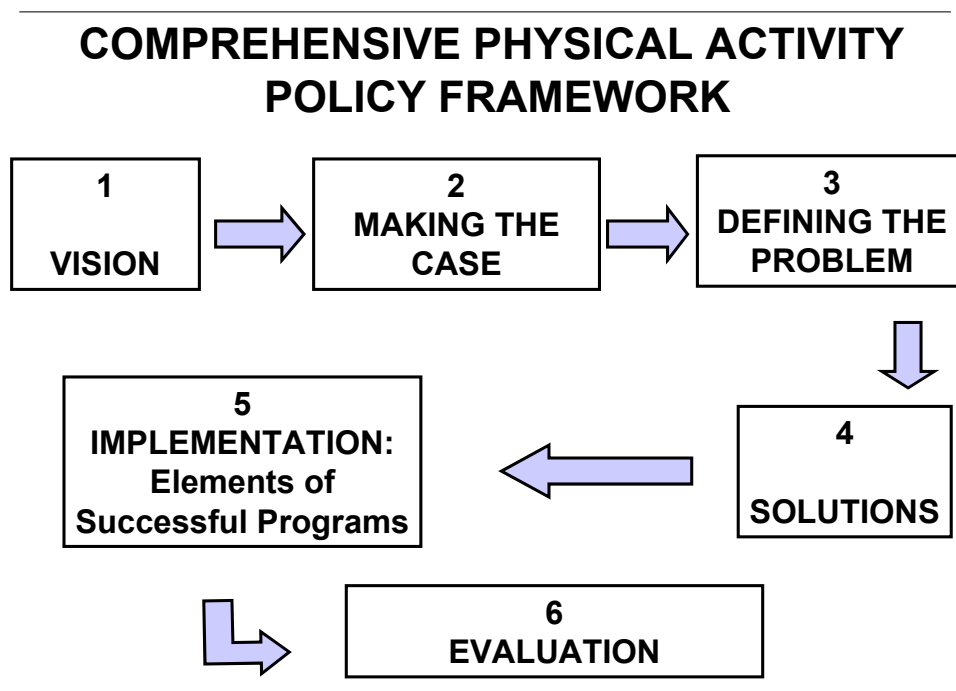


Figure 1. *The Comprehensive physical activity policy framework (Pratt, Bauman, Puska & Matsudo, 2002).*

The **vision** component must consider the following:

- sustainability - the programme's ability to be continued;
- credibility - the ability to be believed or trusted;
- equity and social justice - providing equal access for everyone;
- adaptation - ability to suit different conditions;
- innovation - introducing changes and new ideas; and
- data linked to policy - how far policy is based on scientific evidence.

In **making the case** phase there are seven factors to be highlighted:

- the high prevalence of inactivity;
- the burden of disease;
- positive impact on physical, mental and social health;
- the societal benefits of physical activity;
- a modest amount (at least 30 minutes a day) of physical activity provides substantial health benefits;
- the high economic costs of sedentarism; and
- the link with other risk factors.

To best **define the problem**, it is important to establish:

- the prevalence of sedentarism;
- the target population;
- the determinants of sedentarism; and
- the barriers to physical activity policy and practice.

Within the **solution** component, the following elements must be considered:

- effective interventions based on evidence;
- public health focus on population;
- utilisation of multiple cognitive, social, cultural, and environmental domains;
- use of multiple settings such as home, transport, worksite and leisure time sites or locations;
- regulatory and legislative approaches;
- good governance and implementation;
- opportunistic approach;
- cultural specificity and implementation;
- links with main health issues; and
- links with major health, sport, educational and cultural events.

In the **implementation** phase, the key-elements of successful programmes include:

- clear programme identity and message;
- use of coalitions, partnerships, leaders, and champions;
- multiple intervention strategies, sites and populations;
- consultation and needs assessment;
- written plan and objectives;
- stable base of support;
- integration of physical activity efforts with overall health promotion and policies of health-related sectors;
- focus on physical activity which provides enjoyment and social interaction; and
- evaluation throughout the process.

The **evaluation** should include:

- formative evaluation taking place at the onset and throughout the process;
- final evaluation taking place at the onset and at the end of the process (Morrow, Jackson, Disch & Mood, 1995);
- impact evaluation, i.e. a systematic analysis of permanent or significant changes in human lifestyle, as a consequence of one or a series of actions (Roche, 2000).

The Ecological Model

James Sallis and Neville Owen (1997) have developed the Ecological Model of Influences on Physical Activity, in order to highlight the relationships between intrapersonal, social environmental and physical environmental factors (see in Table 1).

Table 1. *The Ecological Model in Promoting Physical Activity (Sallis & Owen, 1997).*

Ecological Model of Influences on Physical Activity			
Intrapersonal Factors	Social Environmental Factors	Physical Environment Factors	
		Natural Environment	Constructed Environment
Demographics	Supportive behaviors	Weather	Information
Biological	Social Climate	Geography	Urban/suburban
Cognitive/ Affective	Culture		Architectural
Behavioral	Policies governing incentives for activity/inactivity		Transportation
	Policies governing resources for activity/inactivity		Entertainment Infraestructure
			Recreation Infraestructure

Each of the factors in the ecological model plays an important role in promoting physical activity. Other intervention models have dealt with one or two of these components, but it has been unusual to target three or more elements. In an attempt to reach a population of over 37 million inhabitants, the Agita São Paulo Programme has targeted most of the components of the Ecological Model, and has adopted a multilevel approach in its development of the innovative ‘Mobile Management’ style. (see Figure 2).

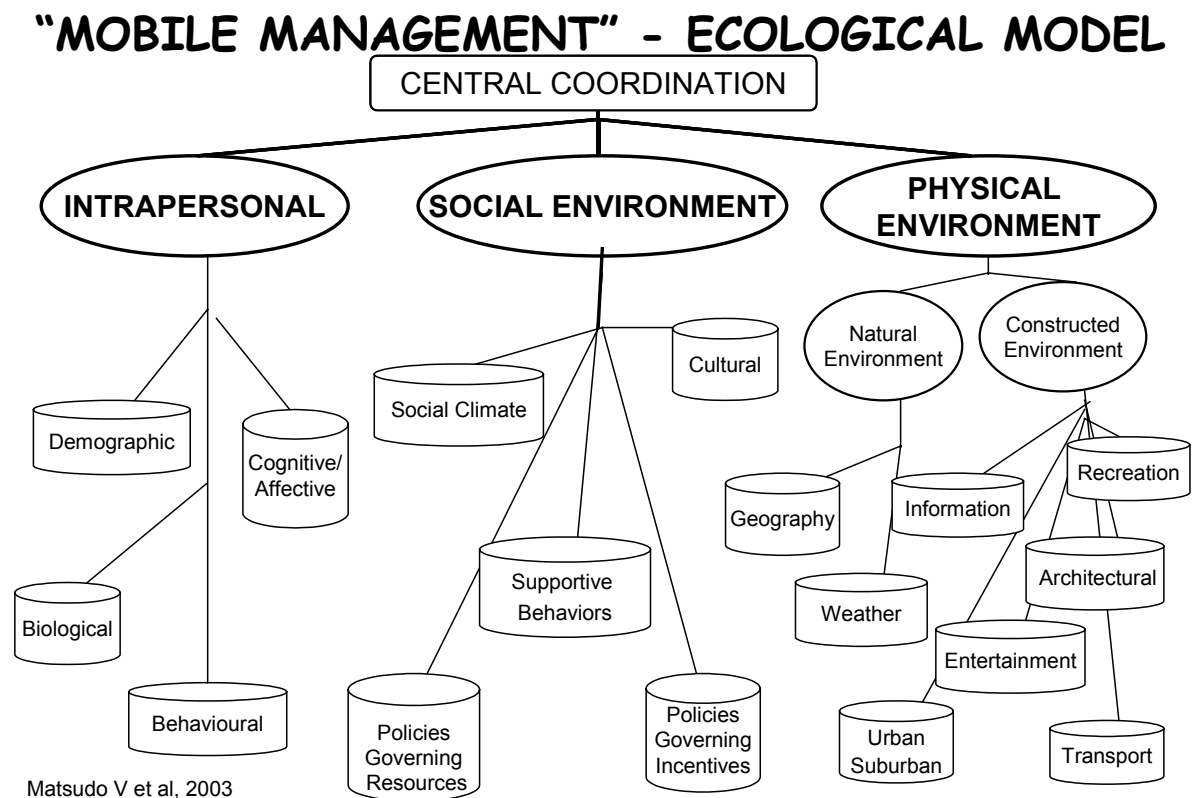


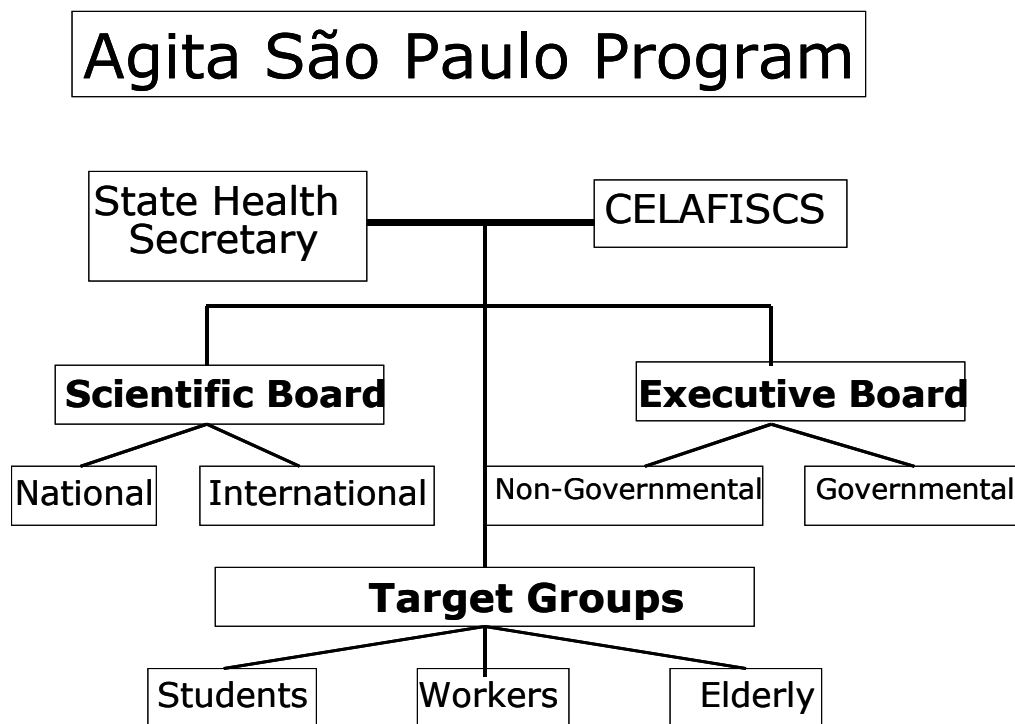
Figure 2. The “Mobile Management” of the Ecological Model (adapted from Sallis & Owen, 1997).

Mobile Management of The Ecological Model

In this representation, the multileveled components of the Ecologic Model are distributed three-dimensionally and in a dynamic balance, as if it were a hanging mobile sculpture (child's toy). When one is successful in targetting an intrapersonal component, for example demographics, this item "loses weight" in relation to other intrapersonal components (i.e., cognitive, biological and behavioural), thus upsetting the balance of the mobile. At that point, it becomes important to target other intrapersonal components. Along the same lines, if all intrapersonal items receive successful interventions, they will "lose weight" in regard to the social and physical environmental factors. Again, awareness of the dynamics of the situation require that factors deserving attention be targetted in order to re-balance the system. This demonstrates the 'mobile' element of this management system.

The Use of Partnerships as a Strategy

Although it is desirable to address several components of the Ecological Model simultaneously, it is not easy, and in many cases almost impossible. The experience of the Agita São Paulo was based upon the use of partnerships (see Pan American Health Organization, 2002, for a more detailed summary). Figure 3 outlines the organisational structure of the programme. Here, different partner institutions, among the 300 members of the Agita São Paulo coalition, target one or two components of the model, and the programme coordinators used the 'mobile' approach to best manage the equilibrium of the total intervention. Examples will be given to show how the central coordination of Agita São Paulo has tried to match partners institutions to the different components of the model.



CELAFISCS is the Center of Studies of the Physical Fitness Research Laboratory in São Caetano do Sul

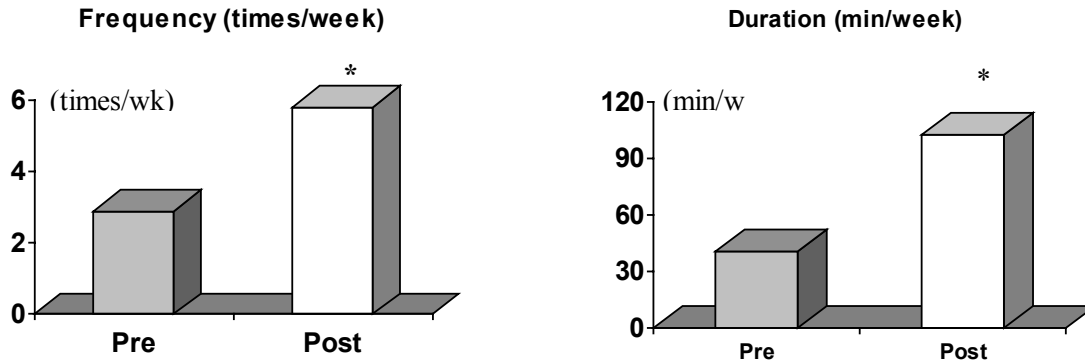
Figure 3. Functional Organisation of Agita São Paulo (Matsudo et al., 2002).

EXAMPLE: INTRAPERSONAL FACTORS

In considering intra-personal factors and targeting the cognitive component of the ecological model, Agita São Paulo invited the State of São Paulo Educational Authority to organise a series of activities to promote active life styles among students, trying to reach the two main purposes of the Agita programme: to increase levels of physical activity in the São Paulo state population, and to increase knowledge of the benefits of active living. The largest, and possibly the most important, cognitive intervention has been the Agita Galera Day (Move the Crowd Day), delivered in 6000 public schools, involving over 6 million students. Agita Galera Day has been held on the last Friday in August since 1998, operating as an opportunity to discuss the purposes mentioned above, and to spread the main message of the Agita Programme: to take at least 30 minutes of physical activity per day, on most (5) days of the week, at moderate intensity, and in continuous or accumulative bouts (Pate et al., 1995).

Preparation for the Agita Galera Day includes videoconferences and special meetings with the educational and health authorities. The printing of over 18,000 manuals, 6,000 posters and 6 million flyers each year allows each child to take home the programme messages, indirectly reaching another social segment: the parents and the relatives, another population of approximately 10 million persons.

Another cognitive intervention initiated by Agita São Paulo is the Dia da Melhoridade (“Best-Ageing” Day). Together with several partners, coordinators aim to spread the programme message to centres for elderly individuals. As a result, elderly women (in our sample population) have increased their participation in moderate-intensity activities from 3.4 to 5.0 times/week and from 86.2 to 192.3 minutes/week. Walking increased from 2.9 to 5.8 times/week, and from 40.8 to 102.3 min/week, as shown in Figure 4 (Ferreira, Matsudo, Matsudo & Braggion, 2001).



* $p < .01$

Figure 4. Pre- and Post-intervention frequency and duration of walking activities in an elderly group of women.

EXAMPLE: SOCIAL ENVIRONMENT

In the case of Agita São Paulo, special attention was given to the media. This was done using an unpaid approach by inviting key media representatives, such as editors, health advisers and columnists, as partners. For the Agita Galera Day, by mobilising the State's school population, coverage by the radio, television and newspaper was generated. News coverage reached as many as 21 million people during the month in which the event was held. Every year, news reports about Agita Galera have been published by at least 30 different newspapers across the State, and by at least seven state and four national television programmes. Based on an analysis of the media coverage, the Programme was able to generate as much as 39 399.80 cm²/year in newspaper and magazine articles, thus facilitating a positive social climate (Figueira, 2000; Oliveira, Figueira Jr, Andrade, Andrade, Matsudo, Araújo & Matsudo, 2000), and saving about US\$13 million/year in television exposure costs alone.

According to data from two representative population samples of almost 3000 persons interviewed at home in 1999 and in 2002, the media coverage resulted in a recall of the Programme's name of 53% in the São Paulo Metropolitan area, and around 36% in the State population. Moreover, the percentage of people able to identify the Programme's message had increased from 31% to 35.5 %, in the Metropolitan area, while in the State population, message identification rose from 9.5% to 24% over three years (Matsudo, Matsudo, Araújo, Andrade, Andrade & Oliveira, 2002a).

EXAMPLE: PHYSICAL ENVIRONMENT

Agita enlisted the help of the YMCA (Youth Men Christian Association), another partner institution of the programme, to develop special summer festivals at the beaches to deliver physical activity messages to people on vacation. This project was known as Agita Verão (Move Summer). During this time, over 100 000 cars, buses, truck drivers and families received special Agita flyers at the road toll stations on highways going to both the countryside and the beaches. This intervention was provided with the help of another partner institution, the State Road Department, and it is a start for a wider programme within the Transport Sector, as Litman (1999; 2003) has suggested.

A programme was also developed with the State Education Authority. In 1998, facing a lack of facilities and physical spaces, particularly in the São Paulo Metropolitan area, the Partners of the Future programme was launched to open schools on weekends to provide access to sporting facilities. In the early stages of the programme, about 40 schools were opened in regions where higher indices of violence existed. This project has since expanded to 400 schools, with high levels of approval from school principals (83% thought it was a good or very good idea). The programme has now been extended to all 6 000 public schools of the state, under the new name of Family School, with the aim of reaching all members of the school community and school neighborhood.

General Impact on Physical Activity Levels of Agita São Paulo

Physical Activity (PA) levels in the São Paulo population have been determined using the International Physical Activity Questionnaire (IPAQ). This instrument was validated by an international group, as requested by the World Health Organization to determine the PA level of the world population (Craig, Marshall, Sjostrom et al., 2003). The short interview format was used for a survey in the São Paulo Metropolitan Area (ABC region) in September 2002 with over 600 subjects. The sample was selected by random and stratified by age, gender, and socioeconomic status (Matsudo et al., 2002a). The percentage of men reaching the CDC/ACSM recommendation of physical activity for health increased from 49% in 1999 to 57% in 2002. The percentage of people (men and women) walking according to the recommendation of at least 30 minutes per day, five or more days per week, increased from 23% to 28% (see Figure 6), representing about a 2% increase/year, while other vigorous and moderate-intensity activities did not change. These findings indicate that in the São Paulo metropolitan area, over 12 000 persons per year started walking regularly and reached the CDC/ACSM recommendation.

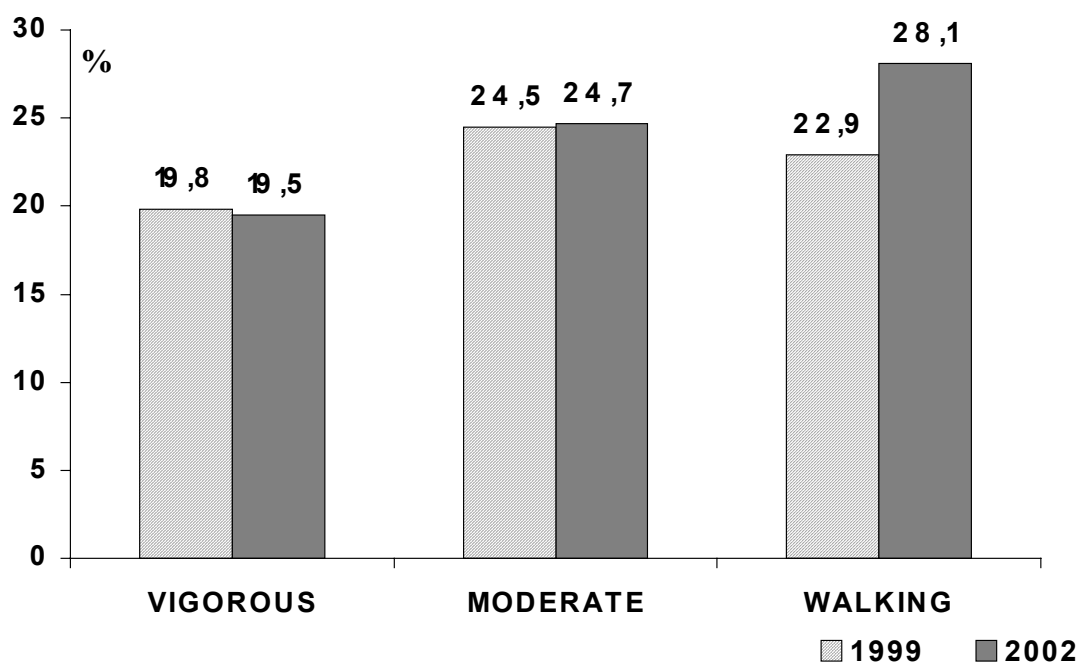


Figure 6. Prevalence of people (men and women) reaching the CDC/ACSM recommendation in São Paulo Metropolitan Area in 1999 and 2002, using vigorous, moderate, or walking activities criteria.

In-home surveys have been conducted annually since 1999 in the São Paulo Metropolitan region with more than 2000 subjects in each sample, selected by random and stratified according to age, gender and socioeconomic status. According to the 2000 survey (N=645) the percentage of sedentary people was only 7% among those who reported knowledge of the Agita São Paulo Programme, as compared to 13% among those who reported not being aware of the Programme. Thus, the sedentariness was almost 50% less prevalent among those who knew the Agita message (Secretaria de Estado da Saúde, 2002).

Difficulties and Challenges

Problems, barriers and difficulties arising during the delivery of the Programme have been discussed by the Executive Board on a monthly basis, and a Strategic Plan has been developed by the Executive and Scientific Board that is updated yearly. Based upon reports, the following are the main challenges to be overcome in implementing a programme of this size and scope:

1. The programme must be self-sustainable, and not rely solely on support from governmental organisations.
2. The active lifestyle message must be disseminated among physical education professionals.
3. Actions promoting physical activity must be incorporated into the focus of corporations and schools, especially those private in nature.
4. Nationwide action for the promotion of active lifestyles must be implemented at the level of different ministries in addition to the Ministry of Health. Examples include the Ministries of Education and Transport.
5. Support from the State Health Secretary (or other relevant government officials) is critical to execute actions and establish alliances.
6. Physical activity promotion materials should be produced that target special groups of the community e.g. women, low socio-economic groups, etc.

Discussion

The Mobile Management model may serve as a catalyst for encouraging professionals from diverse fields to rethink how to face the challenge in managing multisectorial interventions and impacts on human health and behaviour.

In using an approach to match strategic partnership institutions to different components of the ecologic model, the mobile management approach represents a successful model. It is particularly true when considering that efforts to mobilise community resources for health improvements rely heavily on interpersonal and organisational strategies (Stokols, Grzymacs, McMahan & Phillips, 2003).

In the Agita São Paulo experience, the exchange of knowledge among expert consultants and local residents and the intentional efforts by health advocacy groups played a fundamental role in fostering greater collaboration and developing coalitions among existing organisations including public, private, and non-profit entities.

Dealing with different components of the model simultaneously represents not only difficulties, but a high level of complexity. The Agita São Paulo programme is an attempt to manage both difficulties and complexity; the Mobile Management Model has shown to be an effective approach. The model improves community capacity, which is considered of utmost importance in mobilising the energy and talents of members and in securing outside resources, such as capital investment and public services, to foster individual growth and improve the quality of life (Mac Arthur Foundation, 2003). When targeting each item of the model, with the help or assistance of one or more partner institution, the Agita model encourages the leadership of the partners, as well as improves the chance for long term self-sustainability. Agita São Paulo also positively influences the ownership feeling of those groups. This probably explains the progressive increase in number of partner institutions from 30 to over 300 in a six year period.

The Mobile Management supports the idea that the capacity of any intervention to promote good health is influenced by multiple physical, interpersonal, organisational, and socio-cultural circumstances that exist within a setting (O'Donnell, 1989; US Department, 2003).

Acknowledgments

Authors thank the following for their intellectual support: Dr. Mike Pratt, Nutrition and Physical Activity Unit, Center for Disease Control, Atlanta; Dr. Adrian Bauman, Department of Health, University of Sydney, Australia; Glaucia Braggion, Marcela Ferreira, Rosangela Marin and Fernanda Cruciani from the Center of Studies of the Physical Fitness Research Laboratory, in São Caetano do Sul (CELAFISCS) and Agita Sao Paulo. Authors express their gratitude to Suzan Zieff, San Francisco State University, for the English editing work.

References

- Caspersen, C.J., Pereira, M.A. & Curran, K.M. (2000). Changes in physical activity patterns in the United States, by sex and cross-sectional age. *Medicine and Science in Sports and Exercise*, 32 (9), 1601-1609.
- Craig, C.L., Marshall, A.L., Sjostrom, M., Bauman, A.E., Booth, M.L., Ainsworth, B.E., Pratt, M., Ekelund, U., Yngve, A., Sallis, J.F. & Oja, P. (2003). International Physical Activity Questionnaire: 12-Country Reliability and Validity. *Medicine & Science In Sports & Exercise*. 1381-1395.
- Ferreira, M.T., Matsudo, S.M., Matsudo, V.K.R. & Braggion, G.F. (2001). Effects of physical activity and nutritional recommendation on intake pattern, physical activity level and body composition of active women. *Medicine and Science in Sports and Exercise Supplement*, 33(5), S1125.
- Figueira Jr, A.J. (2000). Media and technology power applied to the mechanism of behavior change by means of physical activity intervention programs. *Brazilian Journal of Science and Movement*, 8(3), 39-36.
- Killingsworth, R., Earp, J. & Moore, R. (2003). Supporting health through design: challenges and opportunities. *American Journal of Health Promotion*, 18(1), 1-2.
- Litman, T. (1999). *Reinventing transportation: exploring the paradigm shift needed to reconcile sustainability and transportation objectives*. Transportation Research Record 1670. Transport Research Board. 8-12. Available at: <http://www.vtpi.org>.
- Litman, T. (2003). Integrating public health objectives in transportation decision-making. *American Journal of Health Promotion*, 18(1), 103-108.
- Mac Arthur Foundation (2003). *Building Community Capacity*. Available at <http://www.macfound.org/research/hcd/bcc/index.htm>. Accessed May 10, 2004.
- Matsudo, V.K.R., Andrade, D.R., Matsudo, S.M.M., Araújo, T.L., Andrade, E.L., Figueira Jr, A.J. & Oliveira, L. (2000) Physical Education, Health and Well-Being. *Perspectives*, November 3-5, 85-94.

- Matsudo, S.M.M., Matsudo, V.R., Araújo, T., Andrade, D., Andrade, E., Oliveira, L. & Braggion, G. (2002a) Level of physical activity in São Paulo State population: analysis according to gender, age, socio-economic level, geographic distribution, and knowledge. *Brazilian Journal of Science and Movement*, 10(4), 41-50.
- Matsudo, V., Matsudo, S., Andrade, D., Araújo, T., Andrade, E., Braggion, G. & Oliveira, L. (2002b). Promotion of physical activity in a developing country: The Agita São Paulo experience. *Public Health Nutrition*, 5(1a), 253 -261.
- Matsudo, S.M.M., Matsudo, V.K.R., Araújo, T.L., Andrade, D.R., Andrade, E., Oliveira, L.C. & Braggion, G. (2003a). The Agita São Paulo Program as a model for using physical activity to promote health. *Pan American Journal of Public Health*, 14(4), 265-272.
- Matsudo, V., Matsudo, S., Andrade, D., Araújo, T., Oliveira, L., Andrade E., Ausenka, M. & Braggion, G. (2003b) A gestão sincronizada ("MóBILE") do modelo ecológico de promoção da atividade física: A experiência do Agita São Paulo. *Annals from the XXVI International Symposium on Sports Sciences*, São Paulo, p 97.
- Morrow Jnr, J.R., Jackson, A.W., Disch, J.G. & Mood, D.P. (1995) *Measurement and evaluation in human performance*. Second Edition Human Kinetics, Champaign.
- O'Donnell, M.P. (1989). Definitions of health promotion: part III: expanding the definition. *American Journal of Health Promotion*, 3(3), 5.
- Oliveira, L., Figueira Jr, A., Andrade, D., Andrade, E., Matsudo, S., Araújo, T. & Matsudo, V. (2000) Results of non paid media disclosure in three years of physical activity promotion program in São Paulo State and its input potential population. *Medicine and Science in Sports and Exercise Supplement*, 32(5), S46.
- Pate, R., Pratt, M, Blair, S.N., Haskell, W.L., Macera, C.A., Bouchard, C., Buchner, D., Ettinger, W., Heath, G.W., King, A.C., Kriska, A., Leon, A.S., Marcus, B.H., Paffenbarger, R. Patrick, S.K., Pollock, M.L., Rippe, J.M., Sallis, J. & Wilmore, J.H. (1995). Physical Activity and Public Health. A Recommendation from the Centres for the Disease Control and Prevention and the American College of Sports Medicine. *Journal of American Medical Association*, 273(5), 402-407.

- Pan American Health Organization (2002). *Agita São Paulo: A Multisectoral Coalition in Health*, Washington DC.
- Pan-EU survey on consumer attitudes to physical activity, body weight and health (1999). Brussels, European Commission.
- Pratt, M., Bauman, A., Puska, P. & Matsudo, V. (2002) CDC/WHO Consultation Meeting on Promoting Diet, Physical Activity and Health. Atlanta, Georgia, September.
- Rego, A., Berardo, F. & Rodrigues, S. (1990). Fatores de risco para doenças crônico-não transmissíveis: inquérito domiciliar no município de São Paulo, SP (Brasil). *Metodologia e resultados preliminares. Revista de Saúde Pública*, 24, 277-285.
- Roche, C. (1999). *Impact assessment for development agencies*. Oxfam GB, London.
- Sallis, J.F. & Owen, N. (1997) Ecological models. In: Glanz K, Lewis FM and Rimer BK (Eds). *Health behavior and health education: Theory, research and practice*. 2nd ed., pp 403-424, San Francisco: Jossey – Bass.
- Secretaria de Estado da Saúde-Programa Agita São Paulo. (2002). *Isto é Agita São Paulo*, p 28.
- Stokols, D., Grzymacs, J., McMahan, S., & Phillips, K. (2003) Increasing the health promotive capacity of human environments. *American Journal of Health Promotion*, 18 (1): 4-13.
- US Department of Health and Human Services Health People 2010. (2003). Available at: <http://www.healthypeople.gov>. Accessed November 5, 2003.
- Vuori, I.M. (2001). Health benefits of physical activity with special reference to interaction with diet. *Public Health Nutrition*, 4(2B), 517-528.