

## Effectiveness of a community based health promotional intervention to improve physical activity among women in a rural village from Vavuniya, Sri Lanka

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### ABSTRACT

Physical inactivity is a public health issue and this study was designed to assess the effectiveness of a community based health promotional intervention to improve physical activity among sample of women in a rural village.

This community-based health promotional intervention, designed and conducted based on participatory action research-design conducted in Poothoddam village among a random sample of fifty eligible women of 30-55 years was assessed using the pre-post assessment in comparison to a control group in Puthukkulam. Going by the principles of participatory action research model, the intervention structure was mutually designed with the women in the intervention group. The determinants of physical inactivity were jointly identified and prioritized. Intervention was implemented over 4 months, as a series of discussions and activity sessions in small groups.

The level of physical activity was measured using Tamil version of International Physical Activity Questionnaire short version previously validated to Sri Lanka.

Reduction in the physically inactive category in the intervention group was significant ( $p < 0.05$ ) while the reduction in the control group was not ( $p > 0.05$ ).

The community based health promotional intervention was effective in improving physical activity. The study recommends scaling up of this intervention to women in rural communities.

**Keywords:** Health Promotion Interventions, Physical Activity, Program Evaluation, Public Health Practice,

### Introduction

Physical inactivity is a developing public health issue. World Health Organization (WHO) estimates that in each year 3.2 million deaths are attributed to physical inactivity worldwide [1]. In 2008, 31% of adults aged above 15 years in the world were insufficiently active and among these 28% were men and 34% were women [2]. Estimated prevalence for physical inactivity of women (33.3%) is two times higher than the men (18.4%) in Sri Lanka based on Non-Communicable Disease (NCD) Profile published in 2011 [3]. This evidence indicates that, women are more physically inactive than men. It is well established that physical

inactivity is associated with NCD; such as Diabetes Mellitus (DM), Ischaemic Heart Diseases (IHD) and Hypertension [4]. In Sri Lanka, hospital records are not comprehensive enough to assess the association between NCD and its risk factors [5]. However, it has been estimated that 4.3% of IHD and 5.3% of type-2-DM are associated with physical inactivity in Sri Lanka [6]. Trends in hospital deaths for IHD have been increased island wide from year 2000 (18.6 deaths per 100,000 population) to 2012 (27.6 deaths per 100,000 population). Furthermore, IHD was identified as the first leading cause of hospital deaths in many parts of the country [7]. During the last two decades, lives of people in Northern Province were affected by the devastated civil war that prevailed in the country. Vavuniya is one such affected district located in Northern Province. Rapid developmental activities are being implemented in many parts of this area. Though war deaths have been eliminated, deaths from illnesses

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continue. IHD was the second leading cause of hospital deaths in Vavuniya district [7]. Health promotional approaches to improve physical activity have neither been carried out nor their effectiveness have been assessed in the Sri Lankan context. There is evidence of success of health promotional approaches for physical activity interventions where the intervention is designed and implemented using the principles of Participatory Action Research (PAR) Model [8]. This model focuses on interactive processes where researcher and participants work together to analyse a problem and generate actions to solve the problem. With this background, this study was designed to assess the effectiveness of a community based health promotional intervention to improve level of physical activity among a sample of women in a rural village. This community based health promotional intervention, was designed and conducted based on participatory action research design and the effectiveness was assessed using a pre-post assessment of the selected outcomes in comparison to a control group. The study units for the intervention group were women of 30-55 years of age living in the village Poonthoddam in the district of Vavuniya. Those with limb amputation, limb weakness or any other condition that prevents engagement of physical activity were excluded from the study. All the eligible women in the village were approached and their consent was obtained to participate in the study and a list of eligible and consented women were compiled. Of them, 50 were selected for the study using a simple random method. The control groups of women were 30-55 years living in the village Puthukkulam in Vavuniya. This village was selected based on similarities of basic socio-economic characteristics of the villagers. The same exclusion criteria were applied and the eligible women were approached and their consent was obtained. From a list of eligible, consented women, 50 were selected using a simple random method. This study was carried out for six months in 2013 and ethical approval was obtained from the Ethics Review Committee of Faculty of Medicine and Allied Sciences, Rajarata University of Sri Lanka. Going by the principles of participatory action research model, the intervention structure was mutually designed with the women in the intervention group. The first step was jointly identifying the determinants of physical inactivity. Then the determinants to be addressed through the intervention were prioritized based on whether the determinant was seen among most participants and the feasibility of modifying the determinant during the given time period of the study. Based on the agreed upon determinants to be modified, activities were targeted at changing the intention, unfavorable self-generated gender norms, and improving the level of knowledge on physical activity. Intervention was implemented over a period of 4 months, as a series of discussions and activity sessions directed at small groups. Women themselves formed 6 groups and each group

consist 5 to 8 participants. The frequency of interventional activity was once in 2 weeks. Initial intervention was interactive discussions about wellbeing, comforts of being healthy, overweight and physical activity. Initially activities were facilitated by the principal investigator. And when participants showed interest to continue the process on their own, principal investigator handed over the process to active women in the groups. Women were facilitated with model activity pyramid to categorize their routine activities of last week according to more frequently done at the bottom and infrequent activities at the top of the model pyramid. Their placements were then compared with the standard physical activity pyramid. The improvements they need to make to enhance physical activities were discussed. Interventions to neutralise their deliberately generated gender norms were also addressed. In discussion sessions, their dislikes of playing or performing planned exercises were critically discussed within the groups. Video clips of adult women playing were shown and facilitated them to discuss a scenario of adult women going for a brisk walking in an urban as well as rural area in Sri Lanka. Their comments were interactively discussed in the groups. Weighing and calculating Body Mass Index was performed prior to intervention and thereafter monthly to observe the changes in weights. Weight reductions were appreciated among group members and encouraged their interest to maintain their activities. Control group did not receive any interventional activities. The outcome variable of the study was the level of physical activity of women. Tamil version of World Health Organization International Physical Activity Questionnaire (WHO IPAQ) short version which had been previously validated to Sri Lanka was used to collect this information from the women in intervention and control groups. WHO IPAQ collected data on vigorous-intensity and moderate-intensity activities and walking performed by participants during a period of 7 days before the interview. Pre assessment was conducted in both intervention and control groups prior to the intervention and the post assessment following four months of completion of the intervention. Levels of physical activity were categorized into three categories; physically inactive, minimally active and health enhancing physically active (HEPA) according to WHO IPAQ category scale. All the collected data were analysed using descriptive statistics to demonstrate the differences of pre and post assessment. Significant level (0.05) was assessed using chi-square test. All analysis in this study was performed using SPSS version 20 software. The response rates for the intervention and control groups were 88.0% (44/50) and 80.0% (40/50), respectively. The mean age of the women in intervention group was 42.07 years (SD=± 6.784 years) while, the mean age of the control group was found to be similar 42.1 years (SD=± 6.147 years). The reduction in the physically inactive category in the intervention group was statistically

significant ( $\chi^2$ ,  $p < 0.05$ ) while the reduction in the control group was not ( $\chi^2$ ,  $p > 0.05$ ). An improvement in the HEPA category in the intervention group was also observed. The improvement was from 4.5% to 11.4%, but

this was not statistically significant ( $\chi^2$ ,  $p > 0.05$ ). In the control group, no such improvement was seen. The results of the intervention based on the outcome variable are shown in Table 1 and 2.

**Table 1: Pre-post assessment of levels of physical activity reported in intervention group**

Categories	Intervention				Significance
	Pre		Post		
	No	%	No	%	
Physically inactive	18	40.9	7	15.9	$\chi^2 = 4.84$ , $df = 1$ , $p = 0.027$
Minimally active	24	54.5	32	72.7	$\chi^2 = 1.143$ , $df = 1$ , $p = 0.285$
HEPA group	2	4.5	5	11.4	$\chi^2 = 1.286$ , $df = 1$ , $p = 0.256$
Total	44	100.0	44	100.0	

**Table 2: Pre-post assessment of levels of physical activity reported in control group**

Categories	Control				Significance
	Pre		Post		
	No	%	No	%	
Physically inactive	14	35.0	13	32.5	$\chi^2 = 0.037$ , $df = 1$ , $p = 0.847$
Minimally active	23	57.5	26	65.0	$\chi^2 = 0.184$ , $df = 1$ , $p = 0.667$
HEPA group	3	7.5	1	2.5	$\chi^2 = 1$ , $df = 1$ , $p = 0.317$
Total	40	100.0	40	100.0	

Lack of physical activity is a pressing public health issue worldwide, especially in developing countries, because of its implications with respect to the growing epidemic of chronic diseases [9]. Identifying effective approaches to increase physical activity remains a public health challenge. The role of community-based interventions to promote physical activity has emerged as a critical piece of an overall strategy to increase physical activity behaviours among people [10]. To-date, community-based interventions to increase physical activity has not been summarized in an evidenced-based process in Sri Lanka. Therefore, the present study was designed to assess the effectiveness of a community based intervention which used health promotional approach to change the levels of physical activity of women aged 30 to 55 years in a rural village of Vavuniya, Sri Lanka. Intervention designed and implemented in present study was based on participatory action research design. Among the limited research on interventions to promote physical activity, only a very few had used participatory action research design which allow community participation in designing and implementing the intervention activities. Instead, most of the group programs often consist of structured exercise programs with a fixed duration [11]. One such example is a government funded intervention that provides supervised leisure-time physical activity for community members in public spaces which had been an effective public health strategy to increase population-level physical activity in Brazil. As it was a community-based, professionally

supervised intervention, components of participatory action research were missing in designing the intervention [9]. Further, translated short version of WHO IPAQ was merged into face-to-face Interviewer Administered Questionnaire as the IPAQ working group recommended face-to-face interviews for the developing countries [12]. Use of internationally validated tool like WHO IPAQ enhanced the quality of data collected for this study. Dishman and others recommended the need to conceptualize and in a general way rank determinants according to priority and it will also be necessary to specify major activity determinants for certain populations and settings [13]. Based on these recommendations, the present study identified determinants and prioritized them before implementing the intervention. This study used the principle of recruiting people into voluntary groups in which members provided companionship and support for attaining self-selected activity goal, which is evidence based strategy for the social support intervention in community settings [10]. Literature review revealed a few community-wide campaigns which had measured changes in the percentage of people being active [14 – 16], with a median net increase of 4.2% (range - 2.9% to 9.4%) and energy expenditure with a median net increase of 16.3% [17, 18]. According to present study, 6.9% increment was observed among study group in being physically active which can be taken as good evidence of effectiveness of the intervention. The community based health promotional intervention designed based on participatory

action research model is effective in improving physical activity of women live in rural villages of Vavuniya, Sri Lanka. This study recommends scaling up of this intervention to rural communities with similar socio-economic characteristics to improve physical activity of women.

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