

Effect on physical activity among users of walking track under wetland conditions in sub urban area in Sri Lanka

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Abstract— Planned environment and Communities can strongly enhance opportunities for people to improve their levels of physical activity (PA). Peaceful area for physical activity nevertheless offer benefits to mind and body both. As most of population travel for work from sub-urban and minimal occupancy of wetland in urban busy settings, it is much beneficiary to develop walking tracks (WT) with wet, greenish surroundings in sub-urban area for the use of working community.

Materials & Methods

Between 10/ 2014 and 12/ 2014, a total of 428 individuals, attending to selected WTs in Kotte area were randomly assigned to collect data by using interviewer administered questionnaire. The participants were surveyed of their profile, purpose of using Walking tracks, pattern of PA and compared their PA levels after starting use WT with, PA levels before starting to use WT. Non-parametric “Wilcoxon T test” was used to assess the comparison. Levels of PA in WP (MET score /week) were analyzed in relation to socio-demographic characteristics of the users comparing with standard levels of PA per week.

Results & Discussion

About 67% of participants revealed that they used to come WT for both relaxation and to do PA and 21% of participants were exercisers only. 51% (n=218) were previous regular exercisers and rest of 49% has started to do regular exercises after establishment of WT. Study in American trail tracks, 23% (n=93) of those surveyed were new exercisers and 77% (n=321) were habitual exercisers (Gordon et al., 2004).

Well-educated rich people with more than 40 year age category were attending to WP in majority. Median time spent in WP was 60 minutes and median MET score / week was 792. Wilcoxon T test showed that PA level among users was significantly higher after starting to use WT over their

earlier PA levels ($p < 0.0001$). Being a male (81%), employed person (80%) or having income $>50,000$ LKR (84%) is significantly higher with doing recommended level of PA to their opponents' side ($p < 0.05$).

In contrast to our study findings, study done in Illinois, USA revealed, there were no significant association between male and female regards to level of PA (Gobster et al., 2005). Age category of less than 40 years over more than 40 years was not significantly different from the level of PA in our study ($p = 0.748$). In contrast, Results from survey of North Central Research Station, Illinois, USA, showed that younger users figured most strongly in predicting high activity levels compared elders. Those individuals observed on the trail who were 18–38 years of age were nearly 15 times more likely to be highly active than those users over 55 years (Gobster et al., 2005)

Keywords— Physical activity, Wetlands, Walking Track, Non- communicable disease, suburban area

I. INTRODUCTION

Physical inactivity is the fourth leading risk factor for death worldwide. Approximately 3.2 million people die each year due to physical inactivity. Physical inactivity is a key risk factor for non communicable diseases (NCDs) such as cardiovascular diseases, cancer and diabetes. Physical activity has significant health benefits and contributes to prevent NCDs. Globally; one in three adults is not active enough (WHO, 2014).

People who are insufficiently active have a 20% to 30% increased risk of death compared to people who engage in at least 30 minutes of moderate intensity physical activity on most days of the week (WHO, 2014).

Physical inactivity is the main cause for approximately:

- 21–25% of breast and colon cancers
- 27% of diabetes

- 30% of ischaemic heart disease.

Reasons for physical inactivity

It is important to increase the physical activity during transport, in sedentary behaviour and during leisure time at job or home. Excess use of new technologies at home, abundant utilization of vehicles for transportation and sedentary life styles are contributing for physical inactivity.

Several environmental factors which are linked to urbanization can discourage people from becoming more active, such as:

- Safety and respectable parks, walking ways
- fear of violence and crime in outdoor areas
- unsafe roads and traffic

How to increase physical activity?

Both, society in general and individuals can take action to increase physical activity. In 2013, WHO Member States agreed to reduce physical inactivity by 10% in the framework of the "Global Action Plan for the Prevention and Control of Non-communicable Diseases 2013-2020". Policies and plans to address physical inactivity have been developed in about 80% of WHO Member States, though these are operational in only 56% of the countries. National and local authorities are also adopting policies in a range of sectors to promote and facilitate physical activity.

Justification

Most of the researches conducted in Sri Lanka related to non-communicable diseases were either to describe the diseases and its complications or to determine common risk factors like tobacco use, dietary patterns, alcohol use..etc. But physical inactivity is a well-known risk factor currently and mostly neglected to evaluate its associations to NCD. Driven by the formulation of NCD policy and awareness of NCD burden in Sri Lanka, authorities fell in to concern on implementation of public health programmes to increase the physical activity level among people.

"MahindaChinthanaya" (2005), National Health Policy (1992) and Health Master Plan 2007-2016 of Sri Lanka has recognized prevention and control of NCDs as a priority area of work and national Non-communicable disease prevention policy has absorbed as a strategy to empower the community for healthy life style.

Multi-sectoral approach was used to establish public places with adequate space and safety for doing physical activities. As walking pathways are newly established and people are new to use the pathways, there are no studies so far addressing as a basic study on the people's profile

and pattern of their physical activity. It is important to assess whether the goals of the policy implementation is achieving and to check people who are using it doing the recommended level of physical activity.

As people living in the urban settings are mostly focused on service sector, their economic productivity should be maintained. This research was expected to find out the profile of the current users of walking pathway and pattern of their physical activity in walking pathways. The research findings were expected to identify the gaps and areas that need to be addressed. Based on research evidence, the relevant authorities in health, public administration and social welfare could assess the effectiveness of the policy decisions and take multi-disciplinary approaches to improve the usage of the walking pathways quantitatively and qualitatively.

II. METHODOLOGY

The study was conducted in two selected walking pathways, which are around the Parliament complex, Thalawathugoda and at Nugegoda (Weli para) in Sri JayawardenepuraKotte divisional secretariat area as community based descriptive cross sectional study. These walking pathways were selected as they are having single entry point. The study population consisted of all individuals who were using the walking pathways during the study period in the Sri JayawardenepuraKotte municipal council area. Any individual above 18 years of age during period of data collection in selected walking pathways in Kotte area was included to study. Any individual who accompanies the actual user of the walking pathway as a helper or providing security to actual user (eg: Ministers, High security officials) or if accompanying person's primary purpose of using the walking pathway other than for physical activity was excluded from the study.

From the initial observations, numbers of individuals using walking pathways were disproportionate from one pathway to other pathway, morning to evening and weekdays to weekends. More people are coming on evening if considering time of the day and more in weekends regards to type of the day. So, total of 428 individuals were selected by equally distributing quota to two walking pathways, weekday's vs. weekends and morning over evening. So each walking pathway got 214 participants to be recruited. Then, that number was divided over weekends and weekdays. So, 107 from weekdays and 107 from weekend were selected. Again, 53 of weekday was recruited at morning and rest was selected at evening.

On weekends, equal number of 53 participants was selected in morning and rest at evening.

A structured interviewer administered questionnaire (Annexure I) was used, as it considered the most suitable for this study.

Validation of the questionnaire

Most of the questions in the questionnaire were close ended. A few were open ended where the anticipated variability of responses was high. Questions were constructed to achieve the specific objectives. Some questions were directly taken from the instruments used in previous studies, while some were modified and constructed by the Principal investigator (PI) based on literature evidence. Questions were arranged in a way to maintain the best possible flow.

Judgmental validity of the questionnaire was tested on face and content validity. Face validity of the questionnaire was checked by three heads from Public, Private and Non-government organization sectors in the area and two school teachers. Content validity of the questionnaire was assessed by a Consultant community physician and a Consultant Physician. Necessary amendments were done according to the suggestions and comments received.

Demographic and socio-economic characteristics

This section assessed the personal information related to age, sex, current marital status, religion, highest level of education, monthly personnel income, occupation, and mode of transport to place of working / training / schooling.

Status on Non-communicable diseases and risk factors related to NCD.

It was questioned about if participants were diagnosed of having any selected chronic NCD like ischemic heart disease, chronic respiratory disease, hypertension, cancer, diabetes mellitus and stroke. Risk factors concerned to NCD were interviewed on smoking status currently or previously, perception of stress at home or at work place and blood cholesterol levels.

Physical activity in walking pathway

The following factors were assessed related physical activity among users.

- Frequency of physical activity
- Pattern and type of physical activity
- Duration of physical activity
- Mode of transport to the walking pathway with the distance from their living place

- Above mentioned factors before establishment of walking pathway again

Purpose of using walking pathway

Participants' primary purpose of using the walking pathway related to prevention/ control of NCD, prevention / control of risk factors or to physical fitness was questioned.

Pretesting of the questionnaire

The PI among 10 individuals using walking pathway in Independence square walking pathway, Colombo 7, did pretesting of the questionnaire.

This walking pathway is located in the same district but one divisional secretariat away from the Sri JayawardenepuraKotte divisional secretariat (Adjacent to Thimbirigasyaya DS), which shares much closer socio-demographic and geographic characteristics of Sri JayawardenepuraKotte municipal area.

This population is also provided with walking pathway which was developed by government through urban development project via urban development authority. A different area was selected to prevent the "rippling effect" among the study population due to their prior knowledge about the study (Perera, 2004).

Following the pre-testing, some wording, structure and the sequence of questions were changed to make it more understandable and to maintain the flow in the questionnaire.

Method of data collection

Data collection was done during August- September 2014 period by the principal investigator (PI). At morning and evening, data collection was conducted at the entry point of the walking pathway. Principal investigator interviewed every fifth person who was entering to the walking pathway at pre-determined day and time, as described in sampling technique and most of the participants communicated by English and minor of rest communicated by Sinhala. Recruitment was continued until the quota size was completed according to the type of the day (weekend/ weekday) and time of the day (morning / evening).

Statistical Package for Social Sciences version 20 software was used to enter the data. Responses were coded and entered in the software. Descriptive statistics included quantitative data described in median and inter-quartile range and qualitative data in proportions. As data

were skewed in all variables, non-parametric tests were used to check the associations.

III. RESULTS

Among the study participants, 88.8% (n=380) were Buddhist and 63.8% (n=273) were males. While 11.6% (n=50) have studied up to Grade 11, 61% (n=261) completed their diploma/ degree or post graduate qualification. Among them, 80.8% (n=346) were married and 1.6% (n=7) were widowed. The majority had an income level above Rs.50,001 (56.3%, n=246) and 35.3% were above income of Rs. 100,000. Among the study participants, 1.2% (n=5) were not willing to declare their income.

46% (n= 197) were diagnosed of having any type of chronic non-communicable disease and among diseased participants, 51.3% (n=101) were having cardio-vascular disease if they were suffering only one disease. While 24.4% (n=48) were suffering from diabetes mellitus, 19.8% (n=39) got more than one NCD. Of the participants, 40.2% (172) were using the WP with the purpose of controlling their NCD and 13.8% (n=59) were using to control their high risk factors. But, only 5.4% (n=24) participants came to the walking pathway with the purpose of preventing the establishment of high risk factors. But 35.5% (n=152) were using WP due to the purpose of purely being physically fit. After the categorization of their purposes, only 5.4% (n=23) were classified for primordial prevention, 15.2% (n=65) were classified as primary prevention. Majority of 40.2% (n=172) were categorized to secondary prevention.

Majority of 72.5% (n=310) of the participants were travelled to the walking pathway either by private vehicle or motor bike, while 22.2% (n=95) of individuals were by foot. Among the participants, only 3.3% (n=14) were used to public transport to come to WP.

31.1% (n=28) of participants living in < 1 km radius and 71.3% (n=92) of people living in < 2 km radius were travelling to WP by using private vehicle while 10.2% (n=10) of participants were coming to WP by foot from more than 2 km radius of living. But 66.7% (n=60) were by foot at the radius of < 1 km of living.

Among the current users of WP, median time spent for PA was 60 and inter-quartile ranges were 25% ; 45, 50%; 60, 75%; 60. Median time spent for PA previously before coming to WP was 60 and inter-quartile ranges were 25% ; 45, 50%; 60, 75%; 60 among people who did regular PA.

Comparing the MET score, median score for the current all users of WP was 792 and inter-quartile ranges were 25%; 495, 50%; 792, 75%; 1188. Median MET score for previous PA among all participants was 198 and inter-quartile ranges were 25%; 0, 50%; 198, 75%; 990.

Median MET score was significantly higher among current users after starting to use WP with median MET score before using WP (p < 0.0001). Current median MET score of PA was significantly lower than previous MET score in participants who had previously done regular exercises before starting to use the WP, but their level of MET score was above the recommended level (> 450 METS week-1) though it was lower than previous value.

IV. DISCUSSION

Majority of the users of the walking pathways were above 40 years of age category and well-educated, rich people of the area with income level more than Rs50,000 per month (Table 4.1 & 4.2). Of current users, 61% of them were occupying as senior level officials or professionals (Table 4.3). The self-reported prevalence of known NCD status was 46%(n=197) among participants of our study.

Even though, 51% of all users were coming to walking pathway from their living place less than 2 km radius, 72% of them were travelling to WP by using private transport method.

The most popular pattern of PA in the WP is "walking" with 82% among all users. The current level of PA by MET score is significantly higher among current users of WP than their level of PA by MET score before using WP. It showed, with the use of WP, physical activity levels were significantly improved. In contrast, those who followed regular PA before using WP showed significantly lower physical activity levels with shifting to use WP for their PA. But the participants who were previously followed some PA without using the walking pathway is significantly associated with the current level of PA after getting to use the walking pathway.

V. CONCLUSIONS & RECOMMENDATIONS

Majority of the people using WP were above the age category of 40 years (70.8%, n=303), married (80.8%, n=380) and male (63.8%, n=273) individuals. Among the study participants, larger proportion of people were Buddhist (88.8% , n=380), above diploma educated (61%, n=261) and above income level of Rs 50,000 (56.3 % , n=246). Among the current users of WP, 11.4% (n=49) and 30.4% (n=130) were senior officials and managers and professionals

consecutively. 80% (n=287) of study participants were using private vehicle as their transport method to job.

Large proportion of study participants used the WP as a secondary prevention method, small proportion (20.6%, n=88) is using it for primary and primordial prevention. Proportion of 35.5% (n=152) was using WP due to the purpose of purely being physically fit.

Among the user of WP, 56.6% (n=124) of participant who were living < 2 km radius were travelling to WP by private vehicle and 95% of them who were using WPs were coming within 10 km distance.

Of the study sample, physical activity level became significantly higher than their previous physical activity levels after they started to use the walking pathway (p<0.0001). But, people who did regular physical activity before coming to the walking pathway showed significantly lower physical activity levels after they started to use the walking pathway (p=0.023)

Younger age group should be encouraged to do regular physical activity by increasing their awareness on NCD and health benefits of physical activity and concurrently should be incorporated younger generation preferred physical activity measures to WP like cycling tracks, exercise machines, play area...The awareness programs can be carried out in workplaces and schools.

It should be recommended to establish evenly distributed low cost many WPs covering whole district rather than constructing high cost single WP, since 95% of users were around less than 10km radius to WP. Creating more opportunities for activity for everyone and improving the environment to support it are likely to lead to greater public health benefit than programmes that target only small groups.

It is recommended to establish at least one WP to do physical activity in every municipal council area as minor scale projects such as street tracks, village tracks, playground..etc.

Since, promoting physical activity among healthy people by establishing WP is aligning as a primary preventive method, our study showed; the most number of people were using WP as secondary preventive method. To achieve the policy objectives by encouraging more healthy people to use WP is necessary. It can be reached by ensuring those general practitioners (GPs) and other primary care professionals to offer counselling and advice

on physical activity. Disseminating the cost-benefit of health by doing physical activity should be highlighted.

Demonstrating posters at parking places and providing other materials should optimally discourage private transport to WP.

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ACKNOWLEDGMENT

I am extremely grateful to my supervisor, Consultant community physician, Ministry of Health, Dr RasikaRampatige, Research fellow, University of Queensland, Australia.

My heartfelt gratitude goes to Secretary to Commander of Navy, Headquarters – Navy, Colombo, and navy staff at walking pathways

I sincerely thank Former Honorable Minster of Resettlement, and former Secretary of Defence, giving me permission to conduct the research.