



BUILD ENVIRONMENT AND WALKING BEHAVIOUR AMONG ELDERLY PEOPLE. A STUDY

Dr Jaskaran Singh Sidhu

The relation between health and environment is not new from the beginning of 19th century the city planners joins hand with fitness professionals and special attention was given to health while planning cities, parks, houses and public places, special emphasis were on for fresh air, sunlight, clean drinking water and green belt while designing any structure. landscape architects, builders, and real estate developers all have a role to play in addressing public health challenges.

The simplest, cheapest and natural activity is walking it is the most common exercise which consume less energy and helps in reducing weight, improve cardiovascular fitness, strengthening of bones and muscles, and helps in improving conscious mental process of consciousness. Walking is the most popular and simplest exercise most of the people prefer and do with ease, with increasing awareness of physical fitness people prefer walk to work, school, shop and other daily routine works. It is learned that environment attract walking like well connected roads, pedestrian signals, sidewalks, streetlights, shady trees and attractive routes encourage people for walking.

To built healthy environment clean air and water quality must be for each individual in the present days the pollution in air and water have bad impact on human health all around the world it leads to major lung disease, heart problems, skin diseases, cancer and behavioural problems to the people. Developing green Infrastructure helps in water harvesting which improve water table, giving proper space to tree in architecture design not only improve air quality but also helps in cooling the cities.

Diet and exercise are two major determinants of health. Diet can be improved by taking affordable and nutritive food, Activity is life without active life the human body cannot live longer so walking is a good mode of activity at least 40 minutes daily walking helps you to remain physical fit. With the increase of modern technology the human effort is minimal, the days are not far when human body becomes redundant except for brain.

To create a walking environment for elderly people above from the infrastructure, diet, air, water, walking strip, green area etc the most important aspect for elderly people is the social support, family support and mental makeup which not only support the elderly people but also boot their morale to remain active throughout life, a positive environment at home and in society not only reduce stress in life but also motivate the elderly people to live happy and active. Elderly people who are active and aware about health not only reduce burden on the children but also help in making the next generation aware about the benefits of physical fitness. Research shows that exercise has been shown to relieve stress, anxiety, and mild depression also people living near parks and recreation facilities leads to higher levels of physical activity.

Purpose: The purpose was to investigate the association between built environment and walking behaviour among older adults.

Methods: Built environment characteristics were assessed through a questionnaire. The questionnaire prepared was evaluated by three experts of the field.

Sample- Total 200 people of Mansa district were selected for this study.

Limitation- The study is limited to male population of Mansa district only.

	N	Mean	SD
i) Age	70	0.35	47.89868
ii) Weight	71	0.35	45.24361

iii) annual income	400000	2000	909222.9
iv) Type of diet you take	Vegetarian	150	0.75
Non vegetarian	50	0.25	

From the above table it is evident that average age of walker is 70 having mean value of 0.35 and SD value of 47.89 indicates that middle age group of people preferred walking and were aware about health. In the category of weight the average weight of walking population is 71 having mean value of 0.35 and SD value of 45.24 shows that awareness of health helps them to control their body weight by walking. Annual income of walking population is 4 lac having mean value of 2000 and SD value of 909. In the preference of diet the walking population had more vegetarian population of 150 than non vegetarian having less population of 50 indicates that walkers were aware about the benefits of veggie diet over non veggie even the climate conditions did not allow to have non veggie diet.

Table-2 Walking Schedule N=200

		N	Mean	SD
1. Time and duration of walk	Morning	170	0.85	
	Evening	30	0.15	
	Min/Hrs	45	0.225	48.83052
2. No of days you walk in a week		6	0.03	0.812404
3. Type of walking you prefer	Leisure walking	120	0.6	
	moderate walking	60	0.3	
	brisk walking	20	0.1	
4. You start walking from last	years	7	0.035	0.812404
	months		0	
	days		0	

From the above table the number of people preferred morning walk having higher number of 170 and mean value of 0.85 as compared to people preferred walking in the evening having 30 in number and mean value of 0.15 indicated that morning time is best suited for walking than evening the reason being the availability of time in morning and low level of pollution. Time spent on walking is 45 minutes having mean value of 0.225 and SD value of 48.83 the results of Rantanen Taina (2013) and Bonnie Field et.al(2017) supports the above study indicating that with increase of age the mobility decrease, he further recommended that walking strips and other facilities promote mobility in elderly people. The walking population spent 6 days per week on walking having mean value of 0.03 and SD value of 0.81 the results shows that people devote more time on their health indicating good sign of health awareness among elderly people. In case of type of walking the elderly people preferred leisure walking having average no of 120 and mean value of 0.6 the results of Giehl Marui Weber Corseuil et.al (2012) do not corresponds with the present study they concluded that leisure time activity is not common in elderly people. The number of people preferred moderate walking is 60 having mean value of 0.3 and number preferring brisk walking is 20 having mean value of 0.1 indicates that with the increase in age the brisk walking decrease the reason being for brisk walking the pace required for that is not maintained for long duration. Bourdeaudhuij et.al (2003) supports the above study that minutes of walking and of moderate-intensity activity were related to quality of sidewalks, vigorous activity was related to the facilities with in the home and facilities provided by society. In case you start walking from last how many years the elderly people were engaged in walking from the last 7 years having mean value of 0.35 and SD value of 0.81 showing a positive sign of healthy environment towards physical awareness.

Table -3 Aim of Walking N=200

	N	Mean
Aim of your walking	To remain healthy	145 0.725
	just to meet friends	35 0.175
	do house hold work	15 0.075
	any other	5 0.025
What is the inspiration that you start walking	Fitness awareness	80 0.4
	Disease free life	40 0.2
	Good habit	20 0.1
	Family inspiration	60 0.3
Do you think that walking helps you in any way	reduce obesity	130 0.65
	control you disease	60 0.3
	any other	10 0.05

From the above table it is clear that aim of walking for most of the people is to remain healthy 145 people preferred this having mean value of 0.725, only 35 people walk to meet friends having mean value of 0.175. While walking only 15 people do house hold work having mean value of 0.075 and average 5 people opt for walking due to other reasons having mean value of 0.025 from the above results it is clear that most of people preferred walking to remain fit the health awareness among people promotes walking among elderly people. Inspiration to start walking, most of the people were inspired to remain fit 80 people were inspired to remain fit having mean value of 0.4. Only 40 people walk to live disease free life having mean value of 0.2 People having habit of walking were only 20in number having mean value of 0.1. Family inspiration for walking had good response the no of people inspired for that is 60 having mean value of 0.3. Inspiration for walking results reveals that fitness awareness and family inspiration boot walking among elderly people. AssumpçãoPicorelli Alexandra Miranda et.al (2014) investigate that elderly people were attached to physical activity for health status (fewer health conditions, better self-rated health, taking fewer medications); physical factors (better physical abilities). The effect of walking on individual life shows that 130 people thought that by doing walking their obesity was reduced having mean value of 0.65. Only 60 people thought that walking helps them to control disease showing mean value of 0.3 and only 10people having mean value of 0.05 think that walking had some other impact. The results from the above table indicates that fitness, to remain healthy and to reduce obesity were the main aim of walking among elderly people. Drewnowski Adam and Evans William J(2001) were of view that regular activity helps in controlling certain diseases in elderly people.

Table-4 Inspiration for walking N=200		N	Mean
Do Occurrence of sports events nearby inspire you for walking	yes	170	0.85
	No	30	0.15
Do you have Walking strips in your area	yes	60	0.3
	No	140	0.7
a) if yes do you use it or not	yes	50	0.25
	No	10	0.05
b) If No you want to be in your area	yes	140	0.7
c) Do you think that walking strip facility attract you for walking	yes	180	0.9
	No	20	0.1
On you walking route is there facility of Street lights	yes	145	0.725
	No	55	0.275
a) Are you satisfied with this faculty	yes	140	0.7
	No	60	0.3
Do you have paved roads in your area	yes	195	0.975
	No	5	0.025
Do you think that paved roads help you in smooth walking	yes	195	0.975
	No	5	0.025
In your area is there any well maintained park	yes	60	0.3
	No	140	0.7
a) If yes do you use the park for walking	yes	35	0.175
	No	15	0.025
b) Do you think that park facility initiate you to start walking	yes	50	0.25
	No	150	0.75
On your walking route is there facility of drinking water	yes	190	0.95
	No	10	0.05
Is there any sitting facility provided by corporation	yes	85	0.425
	No	115	0.575
a) If yes you are satisfied with it	yes	80	0.4
	No	5	0.025

On your walking route is there tree plantation	yes	185	0.925
	No	15	0.075
Do you area have good Road connectivity	yes	197	0.985
	No	3	0.015
a) if yes will this help you in walking	yes	195	0.975
	No	5	0.025
Access to sports facilities like gym, grounds, pools etc	easy access	80	0.4
	Restricted access	70	0.35
	Access through payment	50	0.25

In the above table inspiration for walking the occurrence of sports event become inspiration for walking the results indicates that 170 people got inspiration and 30 people disagree with it having mean value of 0.85 and 0.15 respectively showing that occurrence of sports event inspire walking in people. In case of walking strips facility in your area 60 people respond that they had walking strip in their area and 140 people respond of having no strip in their area having mean value of 0.3 and 0.7 respectively, the use of walking strip the number of people using it is 50 having mean value of 0.25 and people not availing the facility were 10 having mean value of 0.05. The number of people want walking strip in their area were 140 having mean value of 0.7.Regarding walking strip enhance walking the number of people think that walking strip inspired walking were 180 having mean value of 0.9 and the people don't felt that walking strip had any effect on walking were 20 having mean value of 0.1.In case of street light facilities on the walking route 145 people having mean value of 0.725 had street light facility on the walking route and 55 people having mean value of 0.275 reported that no street light facilities were there on the walking route. The satisfaction level regarding street light facility only 140 people having mean value of 0.7 were satisfied while 60 people having mean value of 0.3 were not satisfied with the facilities. In case of paved roads 195 people showing mean value of 0.975 responded that they had paved roads in their area and only 5 people having mean value of 0.025 reported of not having paved roads in their area. Regarding the paved roads helps in walking 195 people having mean value of 0.975 thought that paved roads help them for smooth walking and only people 5 in number having mean value of 0.025 didn't thought that paved roads help them for smooth walking, Nuworsoo Cornelius (2013) and Song Yena (2017) supports the results of the above findings indicating that facilities helps in promoting walking among people. Regarding well maintained park facilities only 60 people having mean value of 0.3 admit for the facility and 140 people showing mean value of 0.7 reported having no such type of facility. In case of using well maintained park facility for walking only 35 people avail this facility having mean value of 0.175 and 15 people failed to avail this facility having mean value of 0.025. Regarding park facility inspire people for walking only 50 people were inspired by it having mean value of 0.25 and large number of people i.e. 150 having mean value of 0.75 were not inspired by the above facility. Water facility on the walking route most of the people had access of that having 190 in number and mean value of 0.95, only 10 people having mean value of 0.05 don't confirm the water facility on the walking route. Regarding the sitting facility on the walking route 85 people having mean value of 0.425 reported having the facility and 115 people showing mean value of 0.57 reported no such facilities available on the walking route. In case of satisfaction of sitting facilities only 80 people were satisfied and 5 were not satisfied who had access to this facility having mean value of 0.4 and 0.025 respectively. On your walking route the existence of trees 185 people having mean value of 0.925 reported of having tree on their route only 15 people having mean value of 0.075 reported of having tree on their route of walking, Takano T et.al(2002) were of the view that walkable green sideway helps in promoting physical activity . In case of road connectivity for walking 197 people had the good road connectivity having mean value of 0.985 only 3 people having mean value of 0.015 do not have good road connectivity for walking. Regarding the road connectivity helped the people in walking 195 people having mean value of 0.975 feel that it helped them for walking and only 5 people having mean value of 0.025 do not feel that road connectivity helps them for walking. Access to sports facilities like gym, grounds, pools etc 80 people had easy access 70 people had restricted access and 50people had access through payment having mean values of 0.4, 0.35 and 0.25 respectively. Study conducted by Cleland Verity et.al (2015) Brownson, Ross C et.al(2001) Hoehner Christine M et.al(2005) also indicates that infrastructure promote physical activity, while planning the cities for

future it must be kept in mind that side roads, streetlights, connecting roads etc helps in promoting physical activity so it must be well planned.

		N	Mean
On the way to walking the level of Pollution is	high	95	0.475
	Medium	85	0.425
	low	20	0.1
a) Do you think that level of pollution restrict your walking	Yes	125	0.625
	No	75	0.375
Difficulty in walking or riding a bicycle due to the traffic	Yes	145	0.725
	No	55	0.275
The weather limits the walking and physical activities	yes	155	0.775
	No	45	0.225
Do muddy roads/ unconstructed roads that limit the pathway	yes	58	0.29
	No	142	0.71
Do garbage on the streets restrict walking	yes	120	0.6
	No	80	0.4
Existence of open sewer do restrict the walking	yes	125	0.625
	No	75	0.375

From the above table In case of pollution level on the way to walking 95 people having mean value of 0.0475 indicated high pollution level, medium level pollution was reported by 85 people having mean value of 0.425 and low level pollution was predicted only by 20 people indicating mean value of 0.1. Pollution level creating hindrance in walking was reported by 125 people showing mean value of 0.625, Frank Lawrence D et.al.(2006) results indicates that narrow streets, automobile and air pollution create hindrance in walking. Only 75 people indicating mean value of 0.375 reported that pollution don't creates hindrance while walking. Regarding difficulty in walking due to traffic 145 people indicating mean value of 0.725 felt that traffic cause hindrance while walking. Only 55 people showing mean value of 0.275 don't feel that traffic cause hindrance while walking. Hindrance caused by weather conditions 155 people showing mean value of 0.775 reported that weather conditions restrict their walking, only 45 people indicating mean value of 0.225 don't feel that weather conditions restrict their walking. Muddy and unconstructed roads also restrict walking only 58 people showing mean value of 0.29 felt so, people who did not felt that muddy and unconstructed roads create hindrance were 142 in number indicating mean value of 0.71. In case of garbage restricting walking 120 people felt so indicating mean value of 0.6 and 80 people don't felt that garbage in streets cause hindrance in walking indicating mean value of 0.4. In case of existence of open sewerage restrict walking 125 people responded that it create hindrance in walking indicating mean value of 0.625 the number of people who don't restrict their walking due to open sewer were 75 and indicating mean value of 0.375. Yen Irene H et.al (2009) supports the above results indicating that good neighbourhood environment had good impact on elderly people's health.

		N	Mean
While walking you feel secured	Yes	185	0.925
	No	15	0.075
Sensation of safety during the day	Yes	180	0.9
	No	20	0.1
Dependence for walking	Yes	45	0.225
	No	155	0.775
Fear from stray animals restrict walking	Yes	80	0.4
	No	120	0.6
Your prefer Walking with	friends	25	0.125
	family members	50	0.25
	spouse	70	0.35
	neighbours	20	0.1
	alone	55	0.275

In the above table feeling secure while walking most of the people felt secure while walking 185 people show positive response indicating 0.925 mean value, the number of people don't feel secure while walking were 15 and having mean value of 0.075. The number of people felt safe during day while walking were 180 indicating mean value of 0.9 Florindo Alex Antonio et.al.(2013) supports the results of the above study indicating security among people encourage walking. The people who didn't felt safe during day while walking were 20 indicating mean value of 0.1. The number of people walking without

any dependent were 155 more than the people dependent on other for walking were 45 having mean value of 0.775 and 0.225 respectively. Regarding fear from stray animals restrict walking only 80 people reported that there walking was restricted due to stray animals indicating mean value of 0.4 and 120 people don't felt that stray animals restrict their walking showing mean value of 0.6. The number of People preferred walking with their spouse is 70, walking alone 55 with family members 50 friends and with neighbours is 20 showing mean value of 0.35, 0.275, 0.25, 0.125 and 0.1 respectively. Sallis James F et.al (2009) conducted a study on "Neighbourhood Environments and Physical Activity Among Adults in 11 Countries" and concluded that neighbourhoods built to support physical activity have a strong potential to contribute to increased physical activity. Designing neighbourhoods to support physical activity can now be defined as an international public health issue.

Reference

- Brownson Ross C, Baker Elizabeth A, Housemann Robyn A, Brennan Laura K and Bacak Stephen J.(2001)Environmental and Policy Determinants of Physical Activity in the United States. *American Journal of Public Health* Vol. 91(12).
- Drewnowski Adam and Evans William J(2001)Nutrition, Physical Activity, and Quality of Life in Older Adults: Summary.The *Journals of Gerontology: Series A*, Volume 56, Issue suppl-2, Pages 89-94.
- Takano T, Nakamura K and Watanabe M (2002)Urban residential environments and senior citizens' longevity in megacity areas: the importance of walkable green spaces.*Journal of Epidemiology and Community Health*. Volume 56, Issue 12.
- Bourdeaudhuij Ilse De, Sallis James F and Saelens Brian E. (2003)Environmental Correlates of Physical Activity in a Sample of Belgian Adults. *American Journal of Health Promotion*. Vol 18, Issue 1.
- Hoehner Christine M, Ramirez Laura K, Brennan, Elliott Michael B, Handy Susan L and Brownson Ross C (2005)Perceived and Objective Environmental Measures and Physical Activity Among Urban Adults.*American Journal of Preventive Medicine*, Volume 28, Number 2S2, 105-116.
- Frank Lawrence D, Sallis James F, Conway Terry L, Chapman James E, Saelens Brian E and Bachman William (2006)Many Pathways from Land Use to Health: Associations between Neighborhood Walkability and Active Transportation, Body Mass Index, and Air Quality. *Journal of the American Planning Association*. Volume 72, Issue 1.
- Brownson Ross C, Hoehner Christine M, DayKristen, ForsythAnn and Sallis James F.(2009)Measuring the Built Environment for Physical Activity: State of the Science. *American Journal of Preventive Medicine*. Volume 36, Issue 4.
- SallisJames F, Bowles Heather R, Bauman Adrian, AinsworthBarbara E, Bull MPH,Fiona C, CraigCoral L, Sjöström Michael, Bourdeaudhuij IlseDe, LefevreJohan, MatsudoVictor, Matsudo Sandra, Macfarlane Duncan J, Gomez Luis Fernando, ShigeruInoue MuraseNorio, VolbekieneVida. (2009)Neighbourhood Environments and Physical Activity Among Adults in 11 Countries. *American Journal of Preventive Medicine* Volume 36, Issue 6, Pages 484-490.
- Yen Irene H, Michael Yvonne L and Perdue Leslie (2009)Neighborhood Environment in Studies of Health of Older Adults: A Systematic Review.*American Journal of Preventive Medicine*. Volume 37, Issue 5 Pages 455-463.
- Giehll Marui Weber Corseuil,Schneider Ione Jayce Ceola,Corseui Herton Xavier Benedetti,
- Tânia Rosane Bertoldo and d'Orsil Eleonora (2012)Physical activity and environment perception among older adults: a population study in Florianópolis, Brazil. *Rev Saúde Pública* 2012;46(3).
- Florindo Alex Antonio, Salvador Emanuel Péricles, and Reis Rodrigo Siqueira (2013)Physical Activity and Its Relationship With Perceived Environment Among Adults Living in a Region of Low Socioeconomic Level. *Journal of Physical Activity and Health*, Vol 10, 563-571.
- Rantanen Taina (2013)Promoting Mobility in Older People. *Journal of preventive medicine and public health*. Vol 46(Suppl 1).
- Guibo Sun, Nicolas M Oreskovic and Hui Lin(2014)How do changes to the built environment influence walking behaviors? a longitudinal study within a university campus in Hong Kong. *International Journal of Health Geographics* Vol. 13.
- Cleland Verity, Hughes Clarissa, Thornton Lukar Venn Alison, Squibb Kathryn and Ball Kylie (2015)A Qualitative Study of Environmental Factors Important for Physical Activity in Rural Adults. *PLoS One*. Vol. 10(11).
- Remington Patrick L, Catlin Bridget B and Gennuso Keith P (2015)The County Health Rankings: rationale and methods. *Population Health Metrics* Vol 13:11.
- Giehll Marui Weber Corseuil, Hallal Pedro Curi, Corseuil Claudia Weber, J Ione. Schneider Ceola, and d'Orsi Eleonora (2016)Built Environment and Walking Behavior Among Brazilian Older Adults: A Population-Based Study. *Journal of Physical Activity and Health*, Vol 13, 617-624.
- Brunt Deryk Van(2017) Community Health Records: Establishing a Systematic Approach to Improving Social and Physical Determinants of Health. *American journal of Public Health* Vol 107, No. 3.
- Bonnie Field, Tom Cochrane, Davey, Rachel and Yohannes Kinfu(2017) Cardiovascular disease and diabetes are not barriers to walking among the very elderly: findings from a national Australian survey.*Healthy Aging Research: September 2017 - Volume 6 - Issue 3*.
- AssumpçãoPicorelli Alexandra Miranda, MáximoPereira Leani Souza, Pereira Daniele Sirineu, FelícioDiogo and Sherrington Catherine (2014)Adherence to exercise programs for older people is influenced by program characteristics and personal factors: a systematic review. *Journal of Physiotherapy*. Volume 60, Issue 3, September 2014, Pages 151-156.
- Nuworsoo Cornelius (2013) Considerations for Integrating Bicycling and Walking Facilities into 2 Urban Infrastructure. Paper Submitted for Presentation and Publication The 92nd Annual Meeting of the Transportation Research Board.
- Song Yena, Preston John and Ogilvie David (2017)New walking and cycling infrastructure and modal shift in the UK: A quasi-experimental panel study. *Transportation Research. Part A, Policy and Practice*.