PalArch's Journal of Archaeology of Egypt / Egyptology

ELDERLY PEOPLE AND THEIR WALKABILITY IN THE SEMI URBAN ENVIRONMENT- SPECIAL REFERENCE TO THANJAVUR, TAMILNADU, INDIA.

SATHISH PUSHPARAJ [1*] JANANI SELVAM [2] And VASANTHY MUTHUNARAYANAN [3]

[1 *]Post Doctoral Fellowship in Architecture, Lincoln University College, Malaysia.

[2] Lincoln University College, Malaysia.

[3]Department of Environmental Biotechnology School of Environmental Sciences, Bharathidasan University, Tiruchirapalli – 620 024, Tamil Nadu, India.

SATHISH PUSHPARAJ [1*] JANANI SELVAM [2] And VASANTHY MUTHUNARAYANAN [3]. ELDERLY PEOPLE AND THEIR WALKABILITY IN THE SEMI URBAN ENVIRONMENT- SPECIAL REFERENCE TO THANJAVUR, TAMILNADU, INDIA.– Palarch's Journal Of Archaeology Of Egypt/Egyptology 17(12). ISSN 1567-214x

Key words: Social, community, Walkability, destination, Thanjavur.

ABSTRACT

Sense of socio, community is often mentioned as an asset of new urbanism. The purpose of the study was to explore by studying the on impact of socio community support gained by the elderly people and their walkability Thanjavaur north, a semi-urban environment. Three domains of sense of community were examined, with different aspects of the physical environment, through surveys (questionnaire) as well as interviews with residents. The findings related with social and community perspective suggest that irrespective their present and previous occupations, old age people in the study area are participating in all social activities, the respondents are receiving the community support equally in both joint and nuclear families. As the socio community support pave an appropriate way to reach the destination through walking, it has been concluded that all the streets have same access to the old age people for their desired destination and there is no significant difference between different age categories with regard to destinations presented by walkability by applying different statistical tools Frequency analysis, ANOVA, T- test, cross tabulation, regression analysis.

1. INTRODUCTION

"Get walking. Create a more vital, calmer, happier you." This is a common motive words to encourage the physical activities of the elderly

people. According to United Nations, Population ageing is a global phenomenon. The elderly people are asset for our nation. Their experiences will take forward the youngster in a productive way in all spheres. The tribute may be given to the aged people will be in the form of providing the best built environment that provides them comfort zone for their physical as well as mental health. Walking is a form of exercise that can significantly improve the physical and mental health. Not only can it extend the life and prevent diseases, but also boost the energy and mood. Walking burns calories, boost immune system, reduces stress, fights depression, expand life expectancy and increases energy level. (Times of India, 2020). Walking is considered as a best mode of transport, affordable and easily reach the nearby destination. The prosperous pedestrian network has six criteria for design including, connecting the community with other road network of city, provides linkage with other carriers, for surveying purposes, the area should be zoned very minutely, the crime rate and number of accidents should be minimum, the various characteristics of walkways, and path context, that includes design of streets, aesthetics of built environment, spatial arrangement and overall appearance of the community (Southworth M,2005). In relation to the elderly population (aged 50 years & above), social participation and mobility are major modifiable determinants of older adults' health and key dimensions of successful aging (Rowe and Kahn, 1997).

Since social participation and mobility can be enhanced (Abu-Rayya , 2006) this study aimed to provide a comprehensive understanding regarding how the social, cultural support of the elderly people influence on their walkability in the semi urban environment. It has been suggested that vibrant, walkable spaces may contribute to enhanced creativity and innovation by facilitating social interaction and physical activity, and serving as a source of inspiration (Bradley Bereitschaft, 2019).

STUDY AREA

Thanjavur, called as a granary of south India is chosen as a study area, particularly north part of Thanjavur, Nanjikottai road, an emerging residential area. It is now important area of the extension of Thanjavur district development pertaining to smart city development project. Moreover this is the right time to study and suggest some measures for the upcoming development in this zone. EB colony, Teachers colony and Arokya nagar are chosen as a study area to identify the social, cultural support received by the elderly people which influence on their walkability in the semi urban environment.

2. REVIEW OF LITERATURE

Table: 1 Literature review

Author	Title	Conclusion
Kevin M. Leyden	Social Capital and the Built Environment: The Importance of Walkable Neighborhoods	Walkable, mixed-use neighborhood designs can encourage the development of social capital.
Hee-JungJun, MisunHur	The relationship between walkability and neighborhood social environment: The importance of physical and perceived walkability	perceived walkability enhances neighborhood social environment while physical walkability does not. This study suggests that the negative relationship between physical walkability and neighborhood social environment is related to a spatial intersection between high physical walkability and socio-economic distress.
Joongsub Kim , Rachel Kaplan	Physical and Psychological Factors in Sense of Community: New Urbanist Kentlands and Nearby Orchard Village	Kentlands participants also take greater advantage of the community's walkability and, to a lesser extent, the sociability that high density housing and other design features were intended to foster.
Hsin-Yen Yen, Ching Li	Determinants of physical activity: A path model based on an ecological model of active living	. An analysis of the intrapersonal domain revealed that the variables of female, an older age, and a low educational level, and individuals with obesity or cardiometabolic diseases presented lower odds ratios for active living.

3. OBJECTIVE OF THE STUDY

To study the accessible destination and walkability elderly people
To investigate socio community support received by the elderly in the study area
To integrate the improve socio community support and walkability to reach the accessible destination.

4. METHODOLOGY

The residents of elderly persons are carefully approached, explained well about the scope of the study and collected information. Random sampling method has been used for this study. A representative sample size for the survey would be 100 respondents from three locations in the study area. The research generated both quantitative and qualitative data. Quantitative data was collected by structured questionnaire about to quantify behaviours of the elderly people from the study area towards their walkablity to reach the nearby destinations.

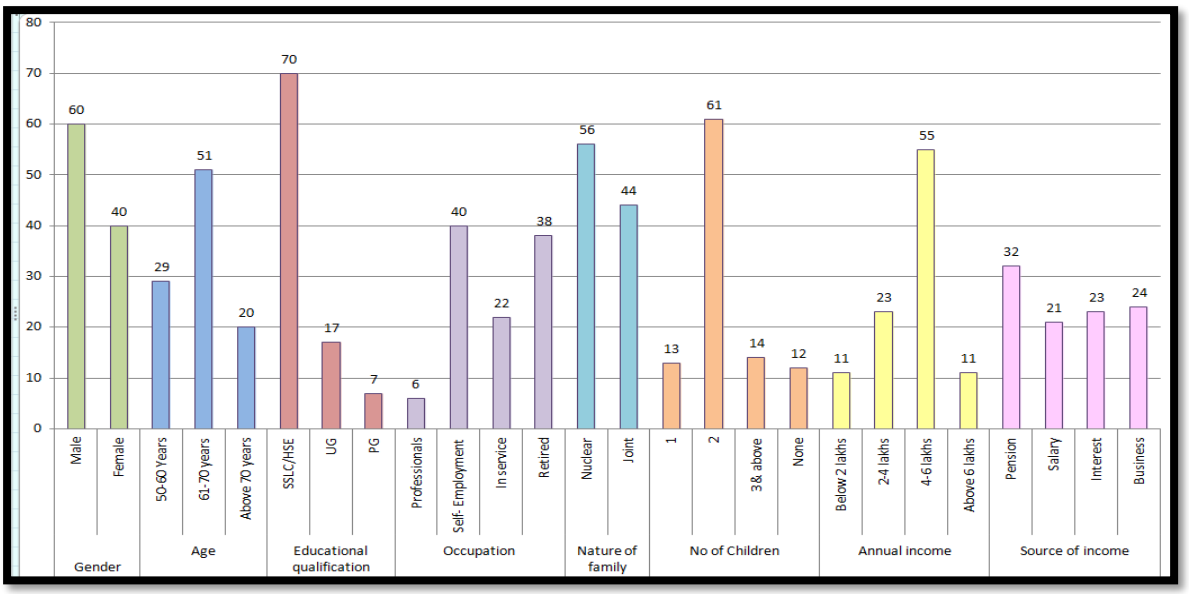
5. ANALYSIS OF RESULTS

5.1 Psychological need analysis on socio-community support

Most public policy debates are concerned with the physical issues of aging, whereas social issues, such as social support, tend to be ignored. Older people are faced with greater losses, given fewer social resources and less adequate social support, in both subjectively perceived support and the frequency of contact. Their psychology towards the social participation and community support has to be analysed as they want that they have to be listened and understood with care.

5.1.1. Demographic Profile Analysis

In this section, the demographic details of the respondents such as gender, age, education, occupation, nature of family, annual income and its sources have been analysed. The results are shown in the following Figure 1.



Source: Computed by the Researcher

Fig. 1 Demographic Profile of the Respondents

The above figure 1 shows the demographic profile of the respondents in the study area. The results of Gender study shows that 60% are male and remaining 40% are female taken as respondents for this study. It is found that majority of the respondents are aged between 61 to 70 years. Most of the respondents are possessing SSLC/HSE as their educational qualification.

In the study area nearly 40% of the respondents are doing their own small ventures as self-employment even after their retirement. About 38%

are retired and enjoying their retired life in the study area. About 56% of the respondents are leading the nuclear family as their children were officiated in various other cities or in countries. Majority of the respondents 61% are having two children. Majority of them are earning 4 to 6 lakhs which shows 55%. While considering the sources of income of the respondents, it can be seen that 32% are getting their pension after completing their services in various portfolios. 25% of the old age people are doing their small business such as real estate, petty shops, vegetables and fruits selling etc. More number of respondents are pension holders.

By analyzing the demographic profile of the respondents, the researcher gathered about the basic details such as Age, Gender, Education, Occupation, Nature of Family, and No. of children, Annual Income and various sources of income of the elderly people which is the base for further analysis towards the well being of the elderly in the study area.

5.1.2 Social Participation

The old age people need social support as it consists of addressing tangible needs, such as assistance with transportation, home and personal care, as well as emotional support such as being listened to understood and comforted. Social support has been recognized as an important social determinant of health because it assists individuals in reaching their physical and emotional needs, and it reduces the effects of stressful events on their quality of life.

5.1.3 Occupation and Social Participation

The respondents at different occupations will participate in social events namely marriage, family function, anniversary, meeting and conference, awareness programme, campaign club/association. Psychologically it has to be identified that how well they are connected with the society at their age based on their occupations have to be analysed.

To facilitate the opinion regarding the occupation and social participation, the following ANOVA one variable study has been conducted and the results are depicted below.

Ho : There is no significant difference among the old age people towards psychological needs relating to occupation and social participation.

Tab. 1 ANOVA results on Occupation and Social participation

ANOVA						
		Sum of Squares	**Df**	**Mean Square**	**F**	**Sig.**
Marriage	Between Groups	0.184	2	0.092	0.739	0.478
	Within Groups	49.406	97	0.124		
	Total	49.59	99			
Family function	Between Groups	2.63	2	1.315	6.73	0.001**
	Within Groups	77.568	97	0.195		
	Total	80.197	99			
Anniversary	Between Groups	1.936	2	0.968	3.926	0.020**
	Within Groups	97.904	97	0.247		
	Total	99.84	99			
Meeting and conference	Between Groups	0.867	2	0.434	1.858	0.157
	Within Groups	92.63	97	0.233		
	Total	93.498	99			
Awareness programme	Between Groups	0.171	2	0.085	0.37	0.691
	Within Groups	91.707	97	0.231		
	Total	91.877	99			
Campaign	Between Groups	0.03	2	0.015	0.073	0.929
	Within Groups	80.168	97	0.202		
	Total	80.197	99			
Club/association	Between Groups	0.921	2	0.461	2.066	0.128
	Within Groups	88.516	97	0.223		
	Total	89.437	99			

** sig. at 1 % level

Based on the overall result, null hypothesis is accepted since the p value is more than 0.05. It is proved that there is no sig. difference among old age people towards psychological needs relating to occupation and social participation except anniversaries and family functions. So it can be concluded that irrespective their present and previous occupations, old age people in the study area are participating in all social activities and there is no significant difference among them except in attending anniversaries and family functions and in all the other activities their psychological needs towards social participation are same.

5.1.4 Community Support

The elderly people are in the need of Community Support. They need age friendly environment. They want to participate in the community life around them. They are very much happy if they can easily access the necessaries.

5.2 Nature of Family and Community Support gained

The old age people are living in the study area in both nuclear and in joint families. There can be connectivity between family nature and the community support gained by the old age people as both the variables are psychologically inter related with each other. In order to identify the opinion about the nature of family and community support received by old age people independent sample t test has been conducted. The details about the study are portrayed below:

Ho: There is no significant difference among the Nature of family and the community support received by the old age people as their psychological needs

The overall summary of the independent sample t test is given below:

Table: 2 Independent sample T test (Levene's Test for Equality of Variances) results

		F	Sig.	T	Df	Mean Difference
Age friendly environment	Equal variances assumed	1.059	0.304	0.615	398	0.087
	Equal variances not assumed			0.619	385.40	0.087
Security and protection	Equal variances assumed	0.116	0.733	0.646	398	0.093
	Equal variances not assumed			0.647	380.20	0.093
Safety and self confidence	Equal variances assumed	0.826	0.364	0.356	398	0.047
	Equal variances not assumed			0.355	371.45	0.047
Friendly neighborhood society	Equal variances assumed	4.659	0.031*	-1.073	398	-0.111
	Equal variances not assumed			-1.089	393.84	-0.111
Stay Independently and participation in community life	Equal variances assumed	1.54	0.215	-1.239	398	-0.135
	Equal variances not assumed			-1.253	391.36	-0.135
Accessibility and availability of necessities	Equal variances assumed	0.028	0.868	-0.06	398	-0.006
	Equal variances not assumed			-0.06	384.68	-0.006

From the above table 2, it can be inferred that the p value is more than 0.05 in all the variables except friendly neighborhood society, the null hypothesis is accepted that there is no significant difference between joint and nuclear family in respect to receiving the community support. and so it is concluded that the respondents are receiving the community

support equally in both joint and nuclear families and it is being required for them to maintain friendly neighborhood society which has to be developed as the p value is less than 0.05, the null hypothesis rejected at 5% level and it can be said that there is significant difference between joint and nuclear family in getting the community support from the friendly neighborhood society.

From the above study it is clear about the built in area, its age friendly environment, social participation and Community support extended & received by the respondents. Henceforth the psychological need of the old age people in the study area has been identified pertaining to the amenities, social participation and community support.

It is our profound duty to provide the necessary amenities to the old age people by creating age friendly environment in order to maintain their health and to lead a happy life. In order to integrate the psychological needs with their health, the health profile of the respondents have been anlaysed below.

5.2.1 Streets and its destinations

In the study area the old age people have access to meet out their daily as well as monthly needs. The list has been shown after making observation from the study area.

Table 3 Destinations of frequent access by the old age people

Small grocery
Convenient store
Formers market
Bakery
Restaurant
Supermarket
Pharmacy
Entertainment
Church/temple/mosque
Bank/ ATM
Post office / library
Fitness facility
Retail stores
Smoke free public places

In all the streets almost all the facilities they can get in the walkable distances which have been observed during the data collection and details collected from the respondents. The regression is shown the compatibility of various streets towards their destinations.

Table 4: Summary of regression study

Model		R	Adjusted R Square	Std. Error of the Estimate
1	.110[a]	0.012	0.010	2.25964
a. Predictors: (Constant), Destinations				
b. Dependent Variable: Thanjavur Streets				

From the above tables, it is inferred about the compatibility of the streets for reaching the destinations by the elderly people. The correlation co-efficient is 0.012 which indicates that 1% of the variance of streets can be accounted for destinations. So it is concluded that all the streets have same access to the old age people for their desired destinations.

5.2.2 Walkability and Destinations

The old age people have to access the various destinations for their livelihood. They have accessibility in all destinations Table 3 shows the destinations where all the old age people in the study area are accessing regularly. Hence it is necessary to give proper access to the elderly people.

The relationship between age and destinations presented by the walkability of the elderly people has been analysed in the following table.

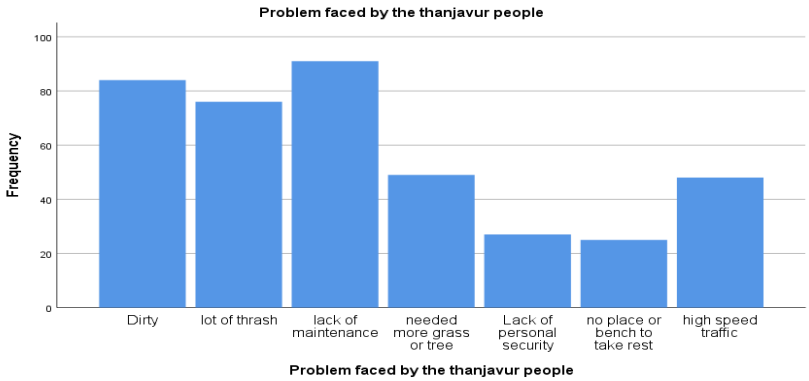
Table 5 Multiple Regression Analysis

Coefficients[a]						
Model		**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**
		B	**Std. Error**	**Beta**		
1	(Constant)	1.961	.396		4.948	.000
	Small grocery,	-.174	.136	-.065	-1.282	.201
	Convenient store	-.004	.100	-.002	-.039	.969
	Formers market	-.042	.071	-.030	-.588	.557
	Bakery	-.037	.088	-.022	-.425	.671
	Restaurant	-.033	.122	-.024	-.270	.787
	Supermarket	.043	.076	.029	.560	.576
	Pharmacy	.089	.087	.052	1.022	.307
	Entertainment	-.035	.123	-.025	-.286	.775
	Church/temple/mosque	.021	.116	.009	.181	.856
	Bank/ ATM	.175	.090	.099	1.948	.052
	Post office / library	-.031	.078	-.020	-.398	.691
	Fitness facility	.040	.074	.027	.534	.594
	Retail stores	.035	.073	.024	.476	.635
	Smoke free public places	-.115	.115	-.051	-1.000	.318
	R=.169[a]	R^2=.029	F=.809	P Value=0.000		
a. Dependent Variable: Age						

The variance of relationship between gender and destinations presented by walkability F=0.809, p value <0.01. The correlation co-efficient is 0.169 indicating that 2.9% of variance of the age of the elderly can be accounted for by linear combination of various destinations presented by walkability. It shows that there is no significant difference between different age categories with regard to destinations presented by walkability.

5.2.3 Problems in walking area

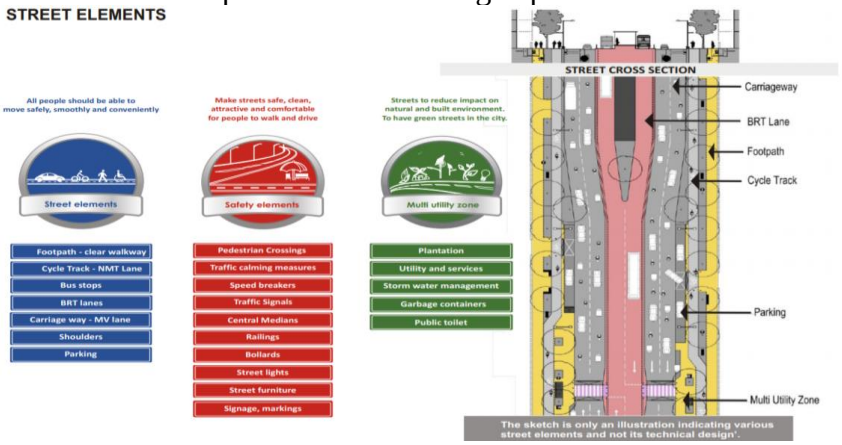
The dirty, lot of thrash, lack of maintenance, green coverage, lack of personal security, no bench to take rest while walking and high speed traffic are the major problems as per the opinion of the old age people in the study area.



From the above study it is clear that lack of maintenance of road followed by dirty which shows 21 % responses from the old age apeople. 19% have the problem of lot of thrash and 12% are having the problem of needed more grass or tree and high speed traffic each. And 6 % have the problems that lack of personal security and no place or bench to take rest. So the walk area should be clean and their basic problems should be solved by the concerned authroities. While discussing with respondants the following hurdles namely Drivers seen to be speeding Street needed cross walk, Curving routes needed for sign hoarding, Blocked line of sight, Road is too wide are the foremost problem in walking to reach their destinations.

6. SUGGESTIONS FOR AGE FRIENDLY BUILT IN ENVIRONMENT

Many guidelines for city development are given byurban street design guidelines, Pune . Those measures are applicable in the current study area to re-establish streets as experiential public spaces that offer citizens to use all modes of transport, including walking with safe and dependable commuting experience.



Source: Urbanstreet design guidelines pune,2016

Figure 2: Street elements

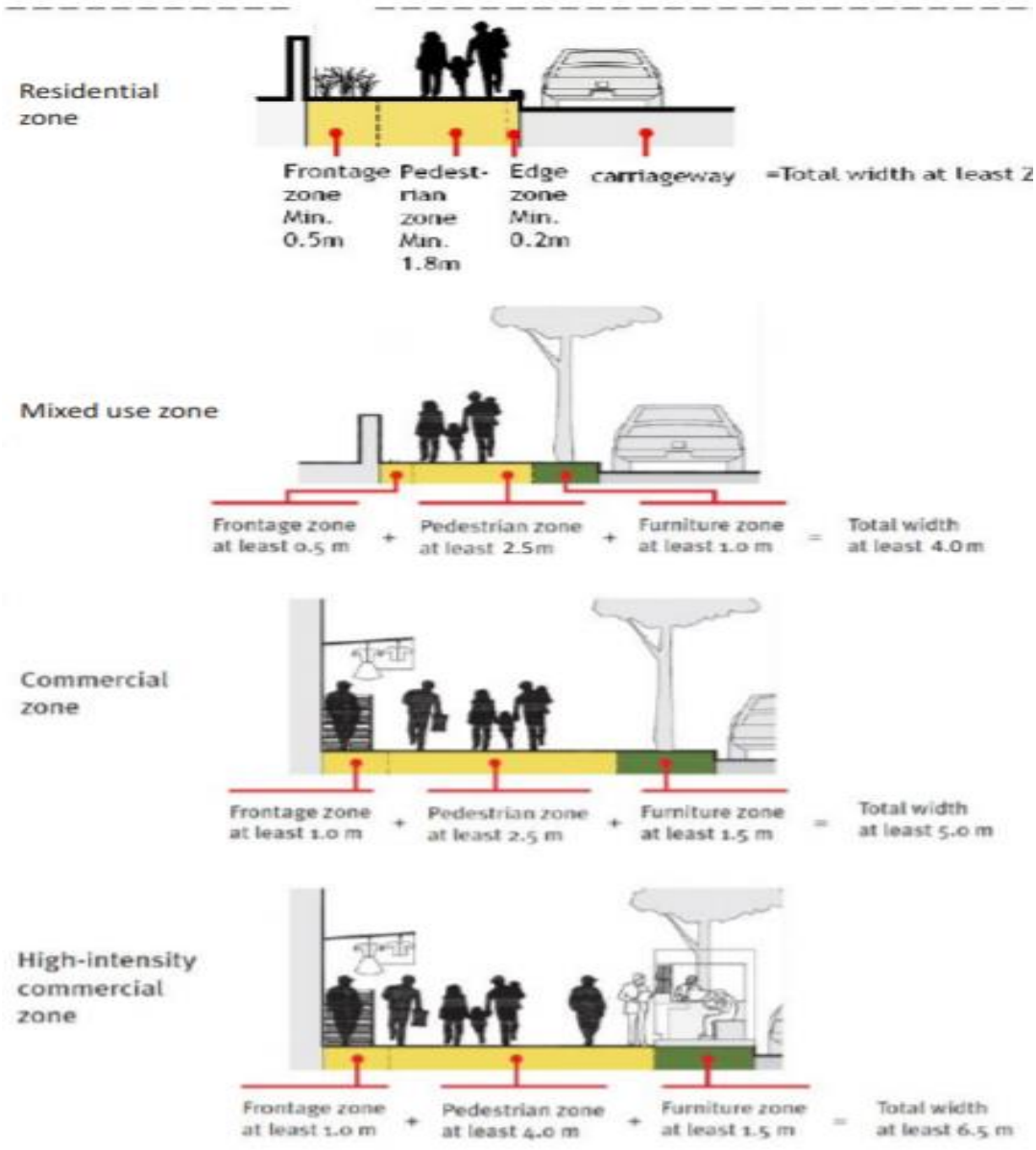
From the street elements foot pathway alone explained below:

Foot path: Footpath or sidewalk is a portion of the street reserved only for pedestrians. It is provided on both edges of the street. Footpaths should be walkable, clean and safe for pedestrians and should be free from encroachments, parking and utility obstructions. Good footpaths are the most essential components of any good street in the city.

Attributes of good footpath design include:

- Accessibility by all users.
- Continuity and connectivity: Adjoining landscaping to create a buffer space between pedestrians and vehicles and also provide shade. Adjoining social space (area where pedestrians can safely participate in public life.

Fig. 3 Pedestrian street width

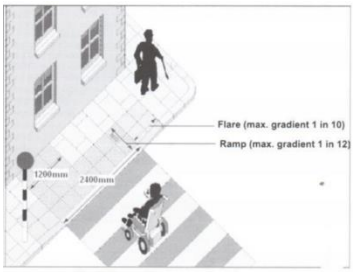


Pedestrian zone width shown in above figures is the minimum specified. Width should be per the adjacent land use and pedestrian density (IRC: 103 - 2012, clause no. 6.1.5.2).

Source:Urbanstreet design guidelines pune,2016

Photo 6 Levelled Crossing Over Cycle Track, BRT Corridor, New Delhi

Fig. 31 Pedestrian Facilities at Roundabout



Source:Guidelines for pedestrian facilities, 2012.

Inclusion of pathway in the study area as per the guidelines really pave away to enhance the mobility of the elderly. More over inclusion of street elements in the appropriate place by following in their respecrtive guideline will make the semi-urban city as much user friendly.

7. SUGGESTIVE MODEL - MOBILITY INDEX ON SOCIO-CULTURAL PARTICIPATION AND WALKABILITY TOWARDS HEALTH OF THE ELDERLY

With aging, the ability to do daily activities (functional ability) declines to some degree in every person. Also, older people, on average, tend to have more disorders and disabilities than do younger people. But

the changes that accompany aging are more than just changes in health. Social issues will influence an older person's risk and experience of illness.

Hence it is our profound duty to give the age friendly built in environment to the elderly to lead a healthy and happy life. Based on the study, its analysis and major findings, the above model has been suggested as a contribution of the study.

7.1 Age Friendly Environment

The facilities required for an elderly people in the study area are listed as such viz., Destinations accessibility which include the major destinations required for their well being, Transport facilities which will lead the elderly to reach wherever they want to go, diversity of land use that includes gardening, ground water facilities etc. The sewage facilities are not proper which has to be taken care. Parks and lawns are to be constructed in order to provide a better age friendly environment to the elderly in the study area.

7.2 Street features

The streets have to be maintained in such a way that it should be easily accessed by the different modes of transportation. Buildings must be constructed with good ventilation and lighting facilities especially in apartments and out door space areas may be allotted for physical activities. Roads should have the connectivity to all the destinations to the elderly and has to be maintained litter free. The vehicles such as taxis and autos should be available all the time because it is very difficult to the old age people to reach hospital sometimes. Trees must be planted since it will give shade and additional greenery to make the streets to be beautiful. The poles must be fixed in the appropriate places.

7.3 Pathways

The pathways are helpful to the pedestrians to reach their destinations for different purposes. Pedestrian cross can be built in the study area as the streets have more cross streets. The old age people are walking in the road itself. Hence proper sidewalks should be constructed based on the urban guidelines which will be really helpful to the old age people to maintain their health through effective walking. The pollution free pathways will enable the old age people to use better.

7.4 Mobility Index

The mobility Index of the old age people has been analysed after making analysis on three dimensions viz., Physical, Physiological and Psychological.

7.5 Physical

The old age people are doing walking and some other physical

activities. Pathways can give opportunities to the elderly people for cycling and outdoor spaces will enable them to do some physical activities.

7.6 Physiological

This includes the various health aspects both physical and mental . Because of their old age they may face some chronical diseases which have to be controlled. Regarding the mental health issues such as age fear, anxiety, loneliness, stress etc. both built in environment and social support will enable them to come out of the issues.

7.7 Psychological

Income plays a vital role in all aspects of life. Old age people whether retired or in service have the occupation for their survival. The income and savings will give the moral support and energy to the old age people psychologically they will get confidence in their lives. The occupation will also psychologically give the moral support to the elderly.

7.8 Social Participations

Social participations will enable the old age people to be connected with the society. They might have more access on social sites. The social festivals can also be celebrated in order to participate in the societal celebrations. Social institutions such as marriage, family code, ownership rights, civil liberties, etc. should be favourable to the elderly.

7.9 Community Support

At their age they are in need of the community support in which they live. They have to lead their lives without fear as the security and safety should be ensured by the community and the concerned authorities. Friendly Neighborhood society should be properly maintained and will extend the support to the elderly people. At the old age they will have more emotions pertaining to anger, worries, happiness and curiosity. Hence these emotions have to be accepted and satisfied with the support gained by the old age people from their community. Hence the above model is a tool to build an environment to the elderly to relish their well being.

As discussed above, some studies of neighborhood walkability are based upon resident perceptions whereas others use environmental audits as an objective measure. However, associations between the built environment and walking behavior differ according to which type of measure was employed. A review of the literature identified two studies that assessed built environment attributes, using both resident perceptions and environmental data audits, and their impact on physical activity (Hoehner *et al.,*. 2005; Michael *et al.,*. 2006b). However, only one of

these articles focused on older adults (Michael *et al.,*. 2006b). Sought to determine the degree of concordance between resident perceptions and environmental audit data, and the relationship between these elements and neighborhood walking among older adults. Results indicated poor agreement between objective and perceived measurements of trails, graffiti and vandalism, sidewalk existence, and sidewalk obstruction. In addition, after adjusting for covariates, the only significant attributes remaining in the walking models were objective and perceived presence of a mall, and the objective existence of graffiti and vandalism (Michael *et al.,*. 2006b).

Research (Leslie *et al.,*. 2005; Handy *et al.,*. 2006) has analyzed levels of walkability on a neighbourhood scale, comparing central neighbourhoods (considered as very walkable) with suburban neighbourhoods (considered as not very walkable or unwalkable). More recent research conducted in the Netherlands (Borst *et al.,*. 2009) and in the United States (Joseph and Zimring 2007) reported that very diverse physical-spatial characteristics can be found within a single neighbourhood, and that a finer analysis of walkability is required. Thorough analysis of walkability in a given city entails a methodological challenge because it is difficult to compile all factors that affect walkability for vast territories (Handy and Clifton 2001; Talen 2002).

Jeff Speck (2013) has recently defined a general theory of Walkability, which explains how, in order to be favoured, a walk has to satisfy four main condition: it must be useful, safe, comfortable and interesting. As stated in "Proposed Walkability Strategy" by Stantec Consulting Ltd. (2009), "walkability is the measure of the overall walking and living conditions in an area and is defined as the extent to which the built environment is friendly to the presence of people walking, living, shopping, visiting, enjoying, or spending time in an area".

Reid Ewing (2009) defined three characteristics for a pedestrian-friendly environment: Essential features: Urban density, mixed use of the territory, relatively small neighbourhoods, safe and recurring pedestrian crossing (every 150 meters), continuous sidewalks wide enough for dyads, separate walkaways from vehicles-dedicated lanes. Highly desirable features: Proximity to commercial activities and green areas, harmony of big and small buildings in the same area, right proportion of space dedicated to the vehicle traffic and pedestrian flow. Nice additional features: Street and public space furniture such as benches, effective signals and urban elements aiming at enriching urban decor and cultural features. Improving mobility implies barrier-free buildings, streets maintenance, perceived safety and, in general, making secure for children to play, for women to venture outside and for elderly to find place in outdoor activities. The whole community would benefit from an age-friendly environment and, in particular, from the participation of its older members.

An age-friendly city is also a city able to develop a "walkable

community" (Jacobs, 2011), that is, to design a human scale environment where safety is promoted, and people can enjoy walking and gathering in comfort.

Starting from the general theory of walkability proposed by Speck (2013), this research redefined a set of walkability assessment criteria specifically focussed on the needs of senior citizens who walk in urban neighbourhoods. As explained in the previous part, senior citizens have more sensitive feelings about urban environments and infrastructures. According to this preliminary consideration, below a set of walkability indicators for the evaluation of the level friendliness of urban areas for senior citizens is proposed and explained: Usefulness: the urban environment should be designed and planned with an adequate level of landuse mix, street connectivity and commercial density, to guarantee the presence of numerous and diverse public services and facilities within a walkable distance (e.g. public transport services, residential facilities, commercial activities). Comfort: urban infrastructures should be designed according to a series of standard criteria of quality and accessibility which accommodate the needs of all pedestrians, especially the senior citizens (e.g. pavement type and continuity on sidewalks, installation of ramps for people with reduced mobility, adequate width of sidewalks to avoid crowds in rush hours), but also according to a set of highly recommended elements which support the comfort while walking (e.g. installation of dedicated urban furniture for resting for the elderly, such as green areas with trees, benches, tables and fountain; installation of waste baskets for separate collection of rubbish to maintain the cleanliness of the city; typologies of public spaces, e.g. playground to meet others) .

(Gorrini & Bertini, 2018) studied about Safety: urban environment should be planned to assure the safety of senior citizens while walking and crossing the roads (e.g. absence of barriers, obstacles and pothole on side-walks to avoid the occurrence of injuries; proper design of road intersection layouts to avoid pedestrian-car accidents; installation of speed bumpers to reduce the speed of vehicles; installation of traffic light and illumination systems at intersections to guarantee visibility of pedestrians while crossing; specific crossing aids to support senior citizens). This is most crucial element when evaluating the walkability for the elderly. Attractiveness: the city should be designed to have with several and distinctive areas of attraction to promoting walking activities; this is based on the presence of points of interest and events, the quality of the architectural appearances (e.g. enclosure, amenities, public spaces, green areas) and the vitality of the social context. Also, the emotional aspects (e.g. hearing and smell) should be considered as a part of attractiveness. Legibility: streets should be designed to support way-finding activities. Most senior citizens are familiar with the neighbourhood where they are walking, however, the urban environment should be designed to be legible, interpretable, memorable, or navigable by itself considering its architectural and infrastructure features (Gorrini & Bertini, 2018).

Secondly, the software of the city, e.g. offered services, relationships and networks relevant to specific contexts, is equally important to transform a city to be age-friendly. Hirsch *et al.,*. (2000) identified two major factors affecting the quality of life of an elder individual: independence (the capacity to care for oneself making one's own decisions) and engagement (the possibility to communicate and share experience and friendship).

Research on age-friendly city also investigated the quality of social relations that promote social participation (Lui, Everingham, Warburton, Cuthill, & Bartlett, 2009; Scharlach, 2012). Some have studied the formal and informal relationships, participation and inclusion (Department for Communities and Local Government, 2008). The relationships between elderly citizens and cities could be positively leveraged through forming a lively and dynamic age-friendly community. Social participation is strongly associated with physical and psychological well- being, in older life as during the entire lifetime; it refers to people's interaction and engagement with other people within a society, whether it is a defined association of people or the neighbourhood in a city. Activities such as working, volunteering, engaging in recreational activities and living with the community, is the heart of social participation. Sense of belonging and trust on people and places enforce social networks and spring new ties (Manju et.al., 2000, Sundar et.al., 2000, Anandan et.al., 2019, Ashok et.al., 2018 & 2019, Vasanthy and Jeganathan 2008 & 2009).

During the 1990s and early 2000s, WHO introduced the concept of "Active Ageing": the word "active" refers to "continuing participating in social, economic, cultural, spiritual and civic affairs, not just the ability to be physically active or to participate in the labour force", having as a final and highest goal to "extend healthy life expectancy and quality of life for all people as they age" (WHO, 2002).

Mobility and accessibility are also key factors in the discourse of Active Ageing as they presume the capacity to move independently and safely from one place to another. From another perspective, Active Aging also promotes the recognition that older adults are not just the beneficiaries of age-friendly communities: they also have a key role to play in defining and shaping their distinctive features (Menec, Means, Keating, Parkhurst, & Eales, 2011; Buffel, 2015). The development of age-friendly city should involve elderly citizens in actively reforming, together with other actors, the city for all citizens.

8. CONCLUSION

Major findings: From the analysis, the following findings are summarized below

It may be concluded that irrespective their present and previous occupations, old age people in the study area are participating in all social activities and there is no significant difference among them except in attending anniversaries and family functions and in all the other activities

their psychological needs towards social participation are same;

- The respondents are receiving the community support equally in both joint and nuclear families and it is being required for them to maintain friendly neighborhood society which has to be developed;
- In the study area the old age people have access to meet out their daily as well as monthly needs based on their requirement;
- It can be concluded that all the streets have same access to the old age people for their desired destination;
- It shows that there is no significant difference between different age categories with regard to destinations presented by walkability.
- The dirty, lot of thrash, lack of maintenance, green coverage, lack of personal security, no bench to take rest while walking and high speed traffic are the major problems as per the opinion of the old age people in the study area.

9. RECOMMENDATIONS

Some recommendations are given by the respondent to improve the walkabilty to reach the nearby destination of the elderly community in the study area:

In order to improve the active participation of elderly people, club activities needs to be improved, numerous parks are expected to introduce, with all details maintain the safety roads and provisions of sidewalk to reach their destination safely through walking. Steps have to be taken to eradicate the hurdles namely Drivers seen to be speeding Street needed cross walk, Curving routes needed for sign hoarding, Blocked line of sight, Road is too wide are the foremost problem in walking to reach their destinations and also measures have to be taken to eradicate the dirty, lot of thrash, lack of maintenance, green coverage, lack of personal security, no bench to take rest while walking and high speed traffic in the study area.

REFERENCES

1. Anandan, V., Senthamilkumar, S., Sundararajulu, V., Gunaselvi, S., Jeganathan, M. 2019. Comparative study on the behavior of conventional ferrocement and modified ferrocement wrapped columns. International Journal of Advanced Research in Engineering and Technology, 2019, 10(6), pp. 22–29.
2. Anandan, V., Senthamilkumar, S., Sundararajulu, V., Gunaselvi, S., Jeganathan, M. 2019. Comparative study on the behavior of modified ferrocement wrapped columns and cfrp wrapped columns. International Journal of Advanced Research in Engineering and Technology, 2019, 10(6), pp. 41–48.
3. Ashok, J., Senthamilkumar, S., Satheesh Kumar, P., Jeganathan, M. 2018. Air quality assessment of Neyveli in Cuddalore district, Tamilnadu,

India. International Journal of Civil Engineering and Technology, 2018, 9(12), pp. 729–735.

4. Ashok, J., Senthamil Kumar, S., Satheesh Kumar, P., Jeganathan, M. 2019. Estimation of cement kiln exhaust on air quality of ariyalur in terms of suspended particulate matter-a case study. International Journal of Civil Engineering and Technology, 2019, 10(1), pp. 498–508.
5. Bradley Bereitschaft, 2019, Exploring perceptions of creativity and walkability in Omaha, NE, City,culture and society,17, 8-19
6. Central Statistics Office, Ministry of Statistics & Programme, June 2011Situation Analysis Of The Elderly in India, Government of India, P.no.i, 5
7. Hee-JungJun, MisunHur, 2015," The relationship between walkability and neighborhood social environment: The importance of physical and perceived walkability", Applied GeographyVolume 62, August, pp 115-124
8. Hsin-Yen Yen, Ching Li,2019, Determinants of physical activity: A path model based on an ecological model of active living PLOS ONE |https://doi.org/10.1371/journal.pone.0220314
9. Joongsub Kim , Rachel Kaplan,2004, Physical and Psychological Factors in Sense of Community: New Urbanist Kentlands and Nearby Orchard Village Environment and Behavior,May 1 (Published online)
10. Kevin M. Leyden,2011," Social Capital and the Built Environment: The Importance of Walkable Neighborhoods" , American Journal of Public Health (AJPH), October 10, (Published online)
11. Manju, M., Nagarajan, R.V., Satheesh Kumar, P., Jeganathan, M. 2020.Environmental quality and economical study on electrical and electronic industry - A case study.International Journal of Advanced Research in Engineering and Technology, 2020, 11(2), pp. 266–275.
12. Manju, M., Nagarajan, R.V., Satheesh Kumar, P., Jeganathan, M. 2020.Determination of heat resistant in building structures - A case study.International Journal of Advanced Research in Engineering and Technology, 2020, 11(2), pp. 94–105.
13. Manju, M., Nagarajan, R.V., Satheesh Kumar, P., Jeganathan, M. 2020. Analysis of quantity and quality of light in schools and residential area of Chennai city, Tamilnadu, India. International Journal of Advanced Research in Engineering and Technology, 2020, 11(2), pp. 259–265.
14. Rowe JW, Kahn RL. Successful aging. Gerontologist. 1997;37(4):433–440. doi: 10.1093/geront/37.4.433. Abu-Rayya HM. Depression and social involvement among elders. The Internet Journal of Health. 2006;5(1):9.
15. Southworth M.,2005, "Designing the Walkable City", J. Urban Plann. Dev. vol: 0733-948, pp131:4.
16. Sundar, S., Stella Mary, S., Jeganathan, M., Satheesh Kumar, P.2020. Evaluation of building construction water quality and removal of total hardness using low cost methods. International Journal of Advanced Research in Engineering and Technology, 2020, 11(2), pp. 27–35
17. Times of India, 2012,27/6/20.

18. Vasanthy, M., Geetha, A., Jeganathan, M., Anitha, A. 2009. A study on drinking water quality in ariyalur area, Tamil Nadu, India.Nature Environment and Pollution Technology, 2009, 8(2), pp. 253–256.
19. Vasanthy, M., Jeganathan, M. 2008. Monitoring of air quality in terms of respirable particulate matter - A case study. Journal of Industrial Pollution control, 2008, 24(1), pp. 53–55.