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Review Article

WALKABILITY ANALYSIS FOR AGE FRIENDLY NEIGHBORHOOD

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Abstract
The attributes of Physical Environment has greater impact on walkability of age friendly Neighborhood. As there is significant increase of young population in India, (Unicef 2019 report) there is a need for age friendly infrastructure for the future. Walkability is a key factor for Age friendly Neighborhood in order to create a sense of healthy and livable community.

Keywords: Physical Environment, Age Friendly, Walkability.

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INTRODUCTION

The attributes of Physical Environment has greater impact on walkability of age friendly Neighborhood. As there is significant increase of young population in India, (Unicef 2019 report) there is a need for age friendly infrastructure for the future. Walkability is a key factor for Agefriendly Neighborhood in order to create a sense of healthy and livable community. This study identifies the factors that have a higher impact on aged communities in terms of walkability in the neighborhood.

LITERATURE REVIEW

Walking has been extensively reviewed and measured as a main component of Agefriendly neighbourhood. Researchers have measured the built environment for different types of walking such as walking for recreation or exercise (physical activity) or walking to reach a destination (active transport) (Handy et al., 2006).

A 'walkable' environment has been described as one that supports active transport modes including walking, cycling and public transport, enabling equitable access to destinations (Freeman et al., 2013) and enhancing social inclusion (Leyden, 2003), while also improving health outcomes through promoting physical activity engagement (Frank et al., 2010; Witten et al., 2012). walking in and around local neighbourhoods is an important component of most adults' total physical activity (Humpel et al., 2004b).

In the context of the public health goal to increase regular moderate-intensity physical activity, walking is the behaviour that is most likely to be amenable to influence (Siegel et al., 1995). Higher population density, greater connectedness of streets (higher number of intersections) and mixed land use has been consistently associated with higher rates of walking and bicycling trips for transportation (Saelens et al., 2003b).

Physical environment is one of the key determinants of the walkability of the individual and hence Planning and Design of the Neighbourhood environment has an effect towards the health of the residents in that particular community(Frank et al., 2010). From an analysis of the Geographic Information System databases, it is found that street connectivity has a higher impact over the walkability of the individual in a particular community. Walkability enable us to reduce the emission of greenhouse gases in providing a better environment(Azmi & Karim, 2012). Walkability is one of the major aspects in creating sustainable and livable communities. Walkability helps in providing a sense of community dwelling in the neighborhood (du Toit et al., 2007).

Community facilities have become a major predictor of the residential density and therefore effective usage of the urban neighborhood depends on the walkability of that particular area (Azmi & Ahmad, 2015). Supportive environment of walkability enhances the public health of that area(Stockton et al., 2016). Street connectivity is highly dependent on the vehicular and pedestrian traffic of a particular area. The land use mix and the social infrastructure of an area significantly influences the walkability aspect of a neighborhood. The transport related factors has a higher priority towards the social connectedness criteria and therefore the planning for the connective infrastructure becomes a prime important factor in determining walkability of an individual(Kaczynski & Glover, 2012). Green space walkability is contributed to the healthiness of an individual from a particular urban area. (Lwin & Murayama, 2011).

RESEARCH METHODOLOGY

The constructs for the study were extracted from the Neighbourhood Environment Walkability scale (NEWS) and the survey sample size is limited to 413. The sampling method chosen for the study is purposive sampling with the respondent aged 50 and above are taken into consideration for the study.The analysis is carried out using the SPSS(version) and the Structural Equation Modeling is carried out using SmartPLS 3.0 software. The statistical test used in the study is Analysis of Variance and Chi square test in order to find the relationship between demographic variables.

ANALYSIS AND INTERPRETATION

In order to study the planning of Age friendly Neighbourhood, there are various constructs (environmental characteristics) that are borrowed from the literature. Access refers to the proximity

and ease of access to non-residential use by the age friendly community. Street connectivity refers to the greater connectedness of streets. (infrastructure was not mentioned, please write one sentence) Aesthetics refers to the visual parameter that adds beauty to buildings. Traffic hazards refers to the planning to reduce the heavy traffic in the area. Crime Hazards refers to the criminal activities that are reported and the measures taken to curb them.

CONSTRUCT	Test – retest Reliability
ACCESS	
Stores are within easy walking distance of my home (AD1)	0.86
There are many places to go within easy walking distance of my home (AD2)	0.75
It is easy to walk to a transit stop (bus, light rail) from home (AD3)	0.73
STREET CONNECTIVITY	
The distance between intersections is usually short (SC1)	0.84
There are many alternative routes for getting from place to place (SC2)	0.71
The streets have few if any, cul-de-sacs (SC3)	0..76
INFRASTRUCTURE	
My neighborhood streets are well lit at night (IF1)	0.85
Walkers and bikers on my neighborhood streets can be easily seen by people in their homes (IF2)	0.77
There are crosswalks and pedestrian signals to help walkers cross busy streets (IF3)	0.73
AESTHETICS	
There are many interesting things to look at while walking (A1)	0.82
There are many attractive natural sights (A2)	0.74
There are attractive buildings/homes (A3)	0.77
TRAFFIC HAZARDS	
There is so much traffic along nearby streets that it makes it difficult or unpleasant to walk (TH1)	0.71
The speed of traffic on most nearby streets is usually slow (TH2)	0.73
Most drivers exceed the posted speed limits while driving (TH3)	0.72
CRIME HAZARDS	
There is a high crime rate (C1)	0.83
The crime rate makes it unsafe to go on walks at night (C2)	0.82
Gang activity (C3)	0.84
Groups of teenagers or adults hanging out causing trouble (C4)	0.77
House or place you suspect drug dealing occurs (C5)	0.74

The constructs were borrowed from the existing literature and analyzed using SmartPLs for the output. In order to check the reliability of the constructs, the Cronbach Alpha is found to be above 0.7 as shown in Table 1.1. Therefore, the instrument is reliable for analyzing the Age friendly Neighbor hood Environment.

Table 1.1: Cronbach Alpha of Contructs

Constructs	Cronbach's Alpha
Access	0.798
Street Connectivity	0.819
Infrastructure	0.799
Aesthetics	0.803
Traffic Hazards	0.798
Crime Hazards	0.875
Age Friendly Neighbor hood	0.806

The Average Variance Extracted has to be above .5 in order to maintain the acceptability of the constructs. Therefore the constructs in the study has an intended measurability which is established through average variance extracted as shown in Table 1.2.

Table 1.2: AVE of the Constructs

	Average Variance Extracted (AVE)
Access	0.713
Street Connectivity	0.734
Infrastructure	0.713
Aesthetics	0.717
Traffic Hazards	0.712
Crime Hazards	0.668
Age Friendly Building Design	0.720

The path coefficient has a p value less than 0.05 which concludes that the paths are significant from the relationship established based on the literature. The T value above 2 indicates the relevancy and the significant relationship between the constructs used for the study.

Table 1.3: Path Value of the Constructs

Path	T Value	P Values
Access -> Age Friendly Neighborhood	3.603	0
Aesthetics -> Age Friendly Neighborhood	3.926	0
Crime Hazards -> Age Friendly Neighborhood	4.09	0
Infrastructure -> Age Friendly Neighborhood	2.754	0.006
Street Connectivity -> Age Friendly Neighborhood	2.138	0.033
Traffic Hazards -> Age Friendly Neighborhood	2.433	0.015

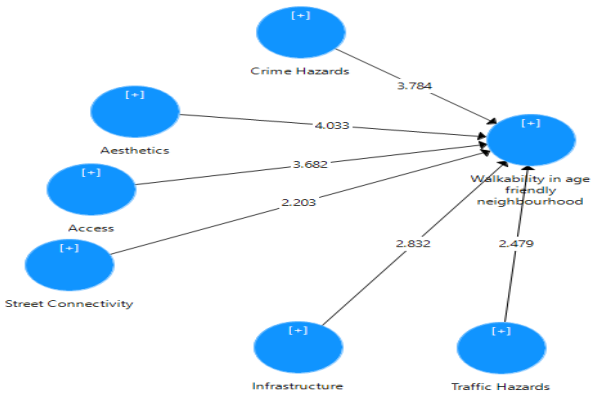

Figure 1.1: T value of the Constructs

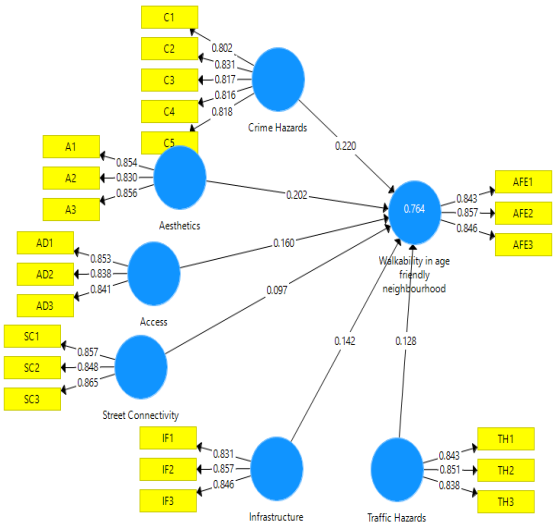

Figure 1.2: Loading Value of Constructs

From the above output, it is found that the construct "Crime hazards" with a high value of 4.090 significantly affect the walkability of age friendly neighbourhood compared to other environmental characteristics. Therefore higher preference need to given for safety aspects to promote walkability in the planning of age friendly Neighborhood. Secondly, "Aesthetics" with a high value of 3.926 is the next influencing factor, as elderly prefer to walk in environments that are visually pleasing and attractive. Natural elements like parks, open spaces & water bodies and manmade elements like aesthetically pleasing structures including historic buildings have the power to give places meaning and beauty. Thirdly, "Access" with a value of 3.6030 is a factor that influences walkability of age friendly neighbourhood is the access to non-residential use by elderly, which indicates mixed landuse is associated with higher rates of walking. Urban planners while planning age-friendly environment can incorporate the findings of the study to enhance walkability of the age friendly population. "Infrastructure" with value of 2.754 indicates that perception of elderly with respect to this construct doesn't significantly affect walkability, due to their limited mobility and dependence on motorised transport. "street connectivity" has the least value of value of 2.138, which denotes that elderly consider this to be least significant parameter for walking, since increased connectivity lead to increased traffic. "Traffic hazards" with value 2.433 indicate that elderly use road during non-peak hours.

CONCLUSION

This study explores the perception of elderly in selected Neighbourhoods in Chennai city in relation to environmental characteristics that significantly affect walkability. Among the neighborhood factors, crime hazards and Aesthetics as factors were found to be significantly affecting aged population. Street connectivity is another factor that has very little influence on aged population. However, the Research has potential to study variation among neighbourhood in terms of built environment variables like intersection density, dwelling density and measure of land-use mix.

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