



UNIVERSITI PUTRA MALAYSIA

***FACTORS INFLUENCING LEISURE WALKING IN RESIDENTIAL
AREAS IN A CITY IN IRAN***

ZEINAB ALIYAS

FRSB 2017 1



**FACTORS INFLUENCING LEISURE WALKING IN RESIDENTIAL
AREAS IN A CITY IN IRAN**

By

ZEINAB ALIYAS

**Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia,
in Fulfillment of the Requirements for the Degree of Doctor of Philosophy**

March 2017

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DEDICATION

This thesis is dedicated to my mother

For her endless love, support, and encouragement.



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Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfillment of the requirement for the Degree of Doctor of Philosophy

FACTORS INFLUENCING LEISURE WALKING IN RESIDENTIAL AREAS IN A CITY IN IRAN

By

ZEINAB ALIYAS

March 2017

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Walkability has become increasingly prevalent in the city planning and public health fields. Although many researchers investigated the factors that influence walkability of neighborhoods but understanding how people are encouraged to do more walking activity with different purposes in the neighborhoods remains uncertain. Bandar Abbas is a fast developing city, thus the changing condition of the city has witnessed residential developments that prioritize vehicle rather than pedestrian. Therefore the walk paths and public parks have not been designed to support walking and pedestrian activities. The current study aimed to determine why residents are discouraged walk leisurely in neighborhoods and which factors strongly influence the walkability of the neighborhoods related to leisure walking. In this regards the walkability of neighborhoods and the environmental characteristics related to leisure walking including neighborhood safety, quality of parks and aesthetics of neighborhoods were examined to determine the influencing factors and concerns of residents in relation to leisure walking activity. Four neighborhoods of Bandar Abbas in Iran were selected as sample areas to examine the issues concerned.

The study adopted a mixed method strategy to address the research inquiries and to draw conclusions from the analyses. Firstly, the structured observations were performed to assess the physical condition of neighborhoods in light of leisure walking needs and benefits. After that a sample of 500 residents from four residential neighborhoods of the city were selected to respond to the structured questionnaire. The objective is to identify the neighborhoods' walkability characteristics and factors that influence pattern of leisure walking. The quantitative data from the survey was analyzed using SPSS and Smart-PLS software and the observation data was used to validate the survey results.

The findings of the study revealed a strong correlation between pattern of leisure walking and neighborhood safety while the functions of neighborhood parks influence pattern of leisure walking activity. Presence of walking trail, size, proximity and safety of parks were identified as essential factors in deciding where to do exercise walking, besides the socio-demographic factors had a significant influence on choosing the parks for recreational walking. Finally, neighborhood safety was discovered to be most strongly associated with the pattern of leisure walking rather than quality of neighborhood parks and aesthetics of neighborhoods.



Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk Ijazah Doktor Falsafah

**FAKTOR YANG MEMPENGARUHI BERJALAN KAKI SANTAI DI
KAWASAN PERUMAHAN SEBUAH BANDAR DI IRAN**

Oleh

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Walkability telah menjadi semakin menonjol dalam kajian perancangan bandar dan bidang kesihatan awam. Walaupun ramai penyelidik mengkaji faktor yang mempengaruhi *walkability* kawasan kejiranan, namun begitu bagaimana untuk menggalakkan orang ramai melakukan lebih banyak aktiviti berjalan-kaki di kawasan perumahan masih tidak dapat ditentukan/ Bandar Abbas ialah bandar yang pesat membangun, oleh itu perubahan yang berlaku menyaksikan pembangunan kediaman yang mengutamakan kenderaan dan bukannya pejalan kaki. Oleh itu, laluan berjalan kaki dan taman awam tidak direka sesuai untuk berjalan kaki dan kemudahan pejalan-kaki. Kajian ini bertujuan untuk menentukan mengapa penduduk tidak digalakkan untuk berjalan-kaki secara santai dan faktor persekitaran yang paling mempengaruhi *walkability* kejiranan tersebut. Dalam hal ini *walkability* kejiranan dan ciri-ciri kawasan perumahan yang berkaitan dengan berjalan kaki termasuk keselamatan kejiranan, kualiti taman dan estetika kawasan perumahan telah diteliti untuk menentukan faktor yang mempengaruhi dan kebimbangan utama penduduk berkaitan aktiviti berjalan kaki secara santai. Empat kawasan kejiranan di Bandar Abbas, Iran dipilih sebagai sampel kawasan kajian bagi mengkaji isu berkenaan.

Kajian ini menggunakan strategi kaedah campuran untuk menangani persoalan penyelidikan dan membuat kesimpulan hasil dari analisis. Pertama, pemerhatian berstruktur dijalankan untuk menilai keadaan fizikal di kawasan perumahan dalam aspek keperluan dan manfaat berjalan kaki. Seterusnya, seramai 500 orang penduduk sebagai sampel dari empat kawasan perumahan bandar tersebut telah dipilih untuk menjawab soal selidik berstruktur. Objektifnya adalah untuk mengenal pasti ciri-ciri *walkability* kejiranan dan faktor yang mempengaruhinya corak berjalan-kaki secara santai. Data kuantitatif dari kajiselidik dianalisis menggunakan perisian SPSS dan Smart-PLS dan data dari pemerhatian tapak kajian digunakan untuk mengesahkan keputusan kaji selidik tersebut.

Dapatan kajian menunjukkan kajian ini menunjukkan korelasi yang kuat di antara corak berjalan kaki santai dan keselamatan kejiranan, manakala fungsi tamankejiranan mempengaruhi corak aktiviti berjalan kaki santai. Kewujudan laluan berjalan kaki, saiz, jarak dan keselamatan taman dikenal pasti sebagai faktor penting dalam membuat keputusan dalam melakukan senaman berjalan kaki, di samping faktor sosio-demografi mempunyai pengaruh besar ke atas pemilihan taman untuk berjalan kaki santai. Akhir sekali, keselamatan kejiranan didapati sangat berkait rapat dengan corak berjalan kaki santai berbanding kualiti taman kejiranan dan estetika kawasan kejiranan.



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I certify that a Thesis Examination Committee has met on 10 March 2017 to conduct the final examination of Zeinab Aliyas on her thesis entitled "Factors Influencing Leisure Walking in Residential Areas in a City in Iran" in accordance with the Universities and University Colleges Act 1971 and the Constitution of the Universiti Putra Malaysia [P.U.(A) 106] 15 March 1998. The Committee recommends that the student be awarded the Doctor of Philosophy.

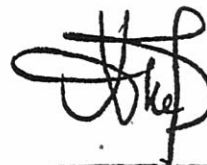
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LIST OF ABBREVIATIONS

PA	Physical activity
LW	Leisure walking
REC-F	Frequency of recreational walking
EX-F	Frequency of exercise walking
PB	Personal barrier
AES	Aesthetics of neighborhood
SAF	Safety
WHO	World health organization
SS	Social safety
CS	Crime safety
TS	Traffic safety
PS	Physical safety
SPSS	Statistical Package for the Social Sciences
PLS-SEM	Partial Least Squares Structural Equation Modeling
Smart-PLS	Smart Partial Least Squares
ATT	Attractiveness of public open space
FAC	Facility of public open space
ACC	Accessibility of public open space
DV	Dependent variable
IV	Independent variable
POS	Public Open Space

CHAPTER 1

INTRODUCTION

1.1 Introduction

Walkability has become increasingly prevalent in the field of city planning, urban design and public health. Although many researchers investigated the factors that influence walkability of neighborhoods, understanding on how people are encouraged to do more walking activity in neighborhoods remains uncertain. In many developing cities, urbanization is strongly related to buildings highways and roads that lead to car-oriented neighborhood. This pattern has undermined the pedestrian priority and comfort of using public spaces in the city. The negative impact is evident in the ever-increasing congestion, pollution, and insufficient liveliness in cities and their neighborhoods. Developed countries have shifted their attention to pedestrian movement in sustaining livability of neighborhoods. On the contrary; the attention towards this issue remains insignificant while the idea of making cities walkable has not been the main agenda for many Asian cities including Bandar Abbas.

In developing nations, travel changes differ from the ones occurred in the advanced countries. According to the recent studies, car ownership shows to be at the peak rate in advanced countries (Goodwin, 2012), while in developing countries, steep rise has been recorded for motorization resulting from the economic development and rising incomes. As estimated by the recent studies, a large portion of vehicle use will be noticed in developing countries by 2050. China, India, and other Asian nations are among these countries (United Nations Habitat, 2011). Therefore, it is not proposed to adopt similar policies and tools in developing countries to deal with the negative effects of car dependency. As an example of developing countries, Iran has also experienced the increasing rate of using private vehicles as the main mode of trips in urban areas in the recent decades (EIA, 2014).

As practice currently stands, the city planning profession has been pressing the need for more walkable communities in order to help decrease air pollution and traffic congestion from the automobile. Walkable communities are therefore meant to support alternative modes of transportation to important destinations. Planners have tried by improving the quality of walkability in neighborhoods increase the level of walking. While the importance of walkability for planners is clear, the public health profession has also begun to emphasize walkable communities but for significantly different reasons. Promoting walkability of neighborhoods can increase walking trip of residents that finally lead to more activity of people. In this regards, health researchers are trying to determine which built environment variables will help individuals receive recommended levels of physical activity.

In the urban planning field, in terms of walking, some neighborhood characteristics have been found, which are consistently associated with higher levels of walking (McCormack et al., 2004; Owen et al., 2004); although, the association related to pattern of walking is different. For example, in a number of studies, it has been found that mix land use, density, and high connectivity (block lengths, intersections, and connections to destinations) have a high contribution to travel walking; however, no association was found with leisure walking (Cervero & Duncan, 2003; Cervero & Gorham, 1995; Hoehner et al., 1994; Frank et al., 2005). On the other hand, accessibility and proximity to public open spaces, aesthetics of neighborhood area, quality of public open spaces were found correlated with leisure walking activity (Ball et al., 2001; Giles-Corti & Donovan 2002; Humpel et al., 2004). However, in the literature, a mixed support has been given to the different aspects of neighborhood safety in related to leisure walking.

Although studying the role of the built environment on walking has received considerable attention in advanced countries, few studies exist in developing countries such as Iran. The present study is the first attempt to explore this issue in Iran to examine potential factors that influence leisure walking and the built environment attributes that support walkability of the neighborhoods.

1.2 Problem Statement

Iranians have significantly lost their interest in walking and cycling in cities, and they increasingly use motorized modes to commute to school or work (Moeeni, 2006). The built environment, feeling of unsafety resulted from traffic and crime, lifestyle changes such as inclination towards electronic media have generally been marked as the primary reasons for the above-mentioned shifts. The reduction of walking activity are generally considered to have a positive relationship to a variety of health aftermaths in the society such as heart diseases, steep rise of obesity and overweight, diabetes type II, and some other diseases (Burchell & Mukherji, 2003; Frank et al., 2006). In this regard, environmental factors can variously influence people. Currently, a large number of scholars relate the current situation to the form and structure of cities and blame urban environmental factors for the unsatisfactory level of people's health (Burdette & Whitaker, 2005). Hence; considering the factors influencing walking activity can help in promoting walking activity.

In this regards, researchers are claiming that the activity level has remained inadequate (Centre for Disease Control and Prevention, 2011). In addition; this level is even decreasing (Armstrong et al, 2000). Hereupon, the prevalence of obesity, overweight, and hypertension in Iran is as high as the US. However, Iranian women are more obese than American women and Iranian men are less obese than their American counterparts (Bahrami et al., 2006). The previous researches showed that in large cities of Iran more than 69% of people are inactive and do not achieve the sufficient level of physical activity. Besides; the respondents' behavior showed that there is a surprisingly low tendency in the city of Tehran to walk out of choice. Almost all pedestrian movement appears to be in response to a need or an obligation to walk, such as for business or essential shopping (Bahrami et al., 2006). On the other hands,

another research in Iran showed that more than 67% of residents in Shiraz did not engage in any type of vigorous-intensity physical activity lasting for at least 10 minutes, accordingly there is a need to promote various forms of physical activity, with special attention to leisure-time activities and vigorous-intensity physical activity, across both genders and all age groups in Iran societies.

Accordingly, substantial interest has emerged to investigate how cities' physical structure can influence people's physical activities. In this regard, it is basically assumed that the surrounding physical structure plays an important role in people's willingness to perform a physical activity such as cycling or walking to work or other destinations, exercise, or sports. Western countries have adopted quite a number of strategies to encourage and facilitate physical activities. However, this issue turns out to be controversial in developing countries such as Iran as it is reviewed and published by the scholars (Soltani & Hoseini, 2014). It is also worth noting that such policies have not been evaluated practically and sufficiently. In terms of planning, pedestrians have been significantly ignored. This results from the steep rise of using private vehicles as well as weak public transport teamed with the increasing commercial and sociological pressures applied by the automobile industry (Bahrainy & Khosravi, 2013). Like all other countries, it is necessary for Iran to analyze, revise, and upgrade its pedestrian networks. This is essential as population has grown rapidly in recent decades leading to the enlargement and development of the Iranian cities and their transportation networks as a result.

During the 1930s, Iran's urban planners and experts of many cities adopted the model known as Haussmann's 19th-century plan for Paris. Hausmann had made comprehensive changes to Paris by replacing wide 'boulevards' with previously narrow streets. However, the neighborhood started to lose its wide, appealing, and Middle Eastern structure and atmosphere to tight-knit neighborhoods to pave the way and facilitate vehicles movement. Pedestrian walkways were given attention only after considering and deciding upon all other land uses and only the unwanted segments were allocated (Moeini, 2009).

In the last two decades, many streets of Bandar Abbas city have undergone changes for the purpose of renovation. As an example, narrowing the sidewalks for the sake of easier vehicle use is widely noticeable in neighborhoods. Although this leads to lowering the pedestrian capacity, it does not always guarantee to provide a higher capacity of roads for vehicles. Indeed, people who do not possess a car utilize a mixture of both public transport and walking to commute in the city. Probably, the pedestrians are primarily concerned with traffic safety in the city. In this regard, it is essential to reduce the conflict between the pedestrians and vehicles. Another issue to be taken into serious consideration about walking is pedestrians' comfort and convenience. Furthermore, the fact that pedestrians in Bandar Abbas are usually encouraged to prefer other modes of transport to walking is of high importance (Komeili, 2013).

As Robertson Kent (1993) pointed out, narrow pavements, lack of safety, unattractive design of buildings, non-connectivity of urban areas are among the important factors leading to decline of walking. The present study was conducted to investigate and assess the key attributes that affect choices of peoples' leisure walking in neighborhoods of Bandar Abbas. It is worth noting that quite a large number of studies of this type have been conducted for major European and North-American cities while cities of developing countries have been relatively ignored to be included in such studies.

Regarding the respondents' behavior, the studies conducted on Iranian neighborhoods revealed the residents' amazingly low inclination towards optional and voluntary walking in neighborhoods. In other words, nearly all pedestrian movement proved to be obligatory and for the purpose of meeting needs such as shopping or business. Hence, it is essential to find a way to encourage the residents towards optional walking such as recreational and exercise types. It is also worth considering that limited studies have focused on leisurely walking and walkability to illustrate these subjects in Iran. However, moderate growth in the new studies of this type has been recorded. In addition, the present literature concentrates on leisurely walking in the studies conducted mainly in advanced countries, and quite a limited number of studies have considered and investigated in the Iranian cities.

On the other hands, based on the report of police office, Bandar Abbas city known as a high crime rate city in Iran (Shariati, 2015). In dealing with the relationship between the physical environment and opportunities for crime, the neighborhoods are the natural geographic and social unit that affect the interaction and behavior of citizens. The neighborhoods act as the place where which communal standards of behavior are first formed. Historically, it is the natural extension of individual and family territoriality that begins at home. In addition, the neighborhoods are places where can provide opportunities for crimes. If crime cannot be controlled at the neighborhood, it will eventually undermine the entire city. In this regards, exploring the crime and safety in scale of neighborhoods seems essential to determine the how contribute with the residents behavior specially leisure walking behavior.

1.3 Knowledge Gap

Walkability of an area can be influenced by diverse factors, among which accessibility, proximity, road and walkway conditions, public transportation program, neighborhood safety and land use patterns but it is vary depending on the type of walking. Leisure walking can be a suitable type of walking for achieving existing standard recommended by professionals for physical activity. It is because leisure walking can be easily implemented to daily life with little risk of injury and low cost. There is yet uncertainty in the most effectual ways for encouraging adults to do this type of walking. In traditional research, concentration has been placed upon the individual-level determinants of walking. However, in recent years, a complementary ecological approach has been adopted by some researchers, postulating that living environment has an effect on walking activity of individuals (Lee & Buchner, 2008).

For the creation of neighborhood environments that can promote leisure walking, those neighborhood elements that have the strongest relationship with leisure walking must be identified. Neighborhood aesthetics and pedestrian infrastructure are two factors that have been consistently identified in this sense (Batty et al., 2010). However, there is a lack of consistent empirical support to other elements of neighborhood, one of which is neighborhood safety. In a number of studies, a positive association has been found between walking in leisure time and general neighborhood safety (WHO, 2010); though, most studies have not found such association (Eyler et al., 1998; Pate et al., 1995). In numerous studies conducted on neighborhood safety, a composite measure has been employed. In this measure, different safety components, including disorder, crime, and traffic, are combined into a comprehensive safety variable (WHO, 2010; Handy, 2005; Korkiakangas et al., 2009). The application of such combined safety indicators may give an impacts to specific safety components obscure. As a result, the determination of relative effect of each specific safety component upon the leisure walking is a difficult task. There is a need for simultaneously exploring the association between different safety components and leisure walking. To our knowledge, only two studies have been carried out for the exploration of multiple safety components (McGinn et al., 2008; Kramer et al., 2013).

In a research conducted by McGinn et al. (2008), association was found between leisure walking and objective measures of criminal offenses, traffic-related offenses, social disorder, and physical disorder. However, in research of Kramer et al. (2013), no association was found between leisure walking and subjective measures of safety aspects. According to McGinn et al. (2008) and Kramer et al. (2013), most of the studies on leisure walking and safety have been carried out in Australia and the United States (Hoehner et al., 2008; Caspersen & Fulton, 2008). In Asia, this subject has been rarely investigated. It is noticeable that, in Asian contexts, findings might differ since the patterns of physical activities and the safety situation of neighborhoods might be different from Europe or the United States (Bernal & Silva, 2009; Pratt et al., 2010). For instance, the result in Europe was different from the United States due to lower crime rates and safer traffic in deprived neighborhoods in European countries in comparison with the United States (Pratt et al., 2010).

Furthermore, the majority of evidence that exists on the relationships between social and built environment and physical activities is on the basis of the research carried out in the context of advanced countries, while the augment of obesity and decrease of physical activity are worldwide phenomena (Monterio et al., 2004). The present effort has contribution to this literature through the identification of why residents don't walk leisurely in neighborhoods. Besides, majority of the studies in Iran have only explored limited factors related to walkability and the effect of physical factors is yet uncertain on leisure walking. Hence, the present research investigates the neighborhood characteristics relevant to leisure walking in four neighborhoods of Bandar Abbas.

Recreational and exercise walking are the most popular types of leisure walking; in most of studies, leisure walking has been referred to in general (Kramer et al., 2013; McGinn et al., 2008; Eyler et al., 2000) and in a few studies, two aspects of leisure

walking (recreation and exercise) have been examined separately (Humpel et al., 2004; Hovell et al., 1989). However, based on our knowledge no study has considered the influence of four aspects of neighborhood safety on different aspects of leisure walking at the same time. Therefore, this research aims to examine the influence of four components of safety on frequency of leisure walking activities.

In addition, Iran is a large country with multiple cultural context. Most of the studies in this subject have been performed in large cities of Iran including, Tehran, Shiraz, Mashhad and Isfahan however the case for smaller cities is not explored accordingly. Besides, according to the location of Iran, different climatic condition in different parts of the country exist and previous researches proved that weather and the geographic condition influence the walking behavior of residents. In this regards; the study focused on a city in south of Iran with different geographic condition from other large cities of Iran. The present study is the first study in Bandar Abbas city in terms of leisure walking and built environment.

1.4 Research Questions

Based on the knowledge gap discussed in the previous section and the aim of the research, the research questions of the study are presented as follow:

1. What are the factors that discourage people to walk leisurely in neighborhoods?
2. What are the key factors with regards to neighborhood walkability characteristics that influence leisure walking of residents?
3. How do neighborhood safety affect the pattern of leisure walking?
4. Which components of neighborhood safety strongly affect frequency of exercise and recreational walking?

1.5 Research Aim and Objective

The aim of this research is to improve the neighborhood's walkability characteristics in Bandar Abbas for leisure walking activities of the residents.

To achieve this aim, we have three objectives as follow.

1. To identify the reason why people do not encourage to walk leisurely within neighborhoods.
2. To examine the walkability characteristics of neighborhoods in regards to leisure walking activities.
3. To evaluate the safety aspects of the neighborhood that encourage leisure walking.

1.6 Research Hypothesis

The following are the hypothesis of the study:

- (i) Walkability conditions of the neighborhoods are poor for residents to walk leisurely in the measured neighborhoods.
- (ii) The examined physical factors of neighborhood including quality of public open spaces, aesthetics of neighborhood and safety influence the pattern of leisure walking of residents.
- (iii) Crime, traffic, social, and physical safety affect leisure walking behavior of residents in the neighborhoods.

1.7 Scope and Limitation of Research

Among three scales (regional, neighbourhood and building plot) the medium scale (neighbourhood) has been chosen for this study. Based on previous researches (Baran & Smith, 2009) people do walking activity within their neighbourhood areas. In addition, to explore the condition of the areas including safety and other characteristics of the neighbourhood with regards to walkability, the neighbourhood scale (normally medium in size) is a proper scale for this purpose. People mostly have proper and more detail knowledge about the areas (neighbourhood) they live compared to the regional context. In this regards based on three environmental characteristics in relation to walkability including aesthetics public open spaces and safety, four neighbourhoods of the city of Banda Abbas have been selected as the study areas.

The research was conducted to identify walkability attributes and factors that influence leisure walking. Neighborhood walking comprises two patterns: transportation and leisure. This study only focused on the leisure walking activity in neighborhood areas.

To investigate the influence of individual attitudes, this study only attempt to explore some individual barriers to leisure walking, and other factors of personal attitudes such as individual encouragements have not examined in the study. The sample population is chosen from four planned neighborhood area that represents other planned neighborhoods of the town selected and only the residents of the specific neighborhoods participated in this study.

In relation to the survey items; the respondents were asked to report and recall their leisure walking activity. It should be noted that such reports might have some bias; if the respondents make mistakes in reporting their leisure walking activity, they may not recall exactly the frequency of their involvement. Nevertheless, this method of the survey for physical activity is still widely regarded as the best and the most used tool available to assess the level of walking activity (Livingstone et al., 2003).

In addition, a measure of personal victimization in the past was found in some studies to be related to feel less safe that was not available and, therefore, not used as an individual-level control. Additionally, generalizability may be limited since the study was conducted on one town of Iran and due to different condition in different neighborhoods of other cities in the country.

Another limitation was that not all neighborhood-level factors have taken into the study, which may have confounded the association to leisure walking. The study was looking for to identify the main factors influencing walkability of the neighborhoods for leisure walking. In addition, many researchers have found that physical activities such as walking are in association with the social environment. These findings led to many studies conducted to examine the role of social characteristics in the neighborhood areas in promoting walking activity (Baran & Smith, 2009). Social safety can be a part of social characteristics of the neighborhood areas; however, other social factors such as interaction have not been examined in the current research. On the other hand, based on many theories on health studies, many factors in terms of attitude was found related to walking behavior; however, the present research was limited to some factors of individual and built environment.

1.8 Significance of the Research

Previous researches showed that people walk more in walkable neighborhoods, in this regards many studies have been performed in advanced countries to identified the neighborhood characteristics that associate with level of walking; however the design of neighborhoods and walking behavior in different countries specially developed countries are vary from advanced societies. On the other hands, the researchers have proved that the factors have different effect on different walking behavior, hence the current research has focused on specific type of walking called leisure walking to better understand how physical environment influence level of leisure walking among residents.

The ability to walk within a neighborhood is also important from an environmental perspective. When environments have been designed to walk and enjoy in neighborhoods, it increase livability of areas and make more happy communities. People would be more encouraged to be outside of their houses, to communicate with others and feel safe and enjoy from surrounding areas that finally influence their physical and mental health.

On the other hands, without understanding of the topic studied, the neighborhood remains unsupportive to pedestrian priorities and their needs for healthy lifestyle and safe environment to do recreational activities would remain unclear. Safety is known as one of the important elements among Iranian residents in terms of quality of life; therefore, this study can be used to determine the role of safety in the neighborhood areas. Safety emerges as an influential factor on walking behavior. Due to exploring neighborhood safety in more micro-ecological set of measures, the study can help to better specify the role of each aspects of safety related to leisure walking. Finally the

study can help designers to determine why people don't walk leisurely in neighborhoods, it helps in designing more walkable neighborhoods in related to leisure walking activity.

1.9 Structure of the Thesis

The rest of the thesis is organized as follows. Chapter 2 reviews the literature regarding to the walkability, elements of built environment in relation to leisure walking behavior including neighborhood safety, quality of public open spaces and aesthetics of neighborhoods. In addition, other factors such as individual barriers to walking are also explored and finally the conceptual and theoretical framework for the current research is presented based on reviewing the literature and aim of the research. Chapter 3 discusses the methodology used in this study. Questionnaire, and observation were examined to find out the results based on objectives of the study. Chapter 4 presents the results of the study and runs SPSS and Smart-PLS to test the hypothesis of the study and finally presents the results of the study. Chapters 5 explores the findings of the study and compares them with those of previous studies and finally discusses how the findings of the research fill the knowledge gap in this field. And finally, the summary of the research, implications, contributions of the research to urban planning and design, and suggestions for future research are discussed in Chapter 6.

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