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EXPLORING MOTIVATION AND PREFERENCE OF TRANSPORT WALKING Bilkent University 2023

EXPLORING THE ROLE OF MOTIVATION AND
PREFERENCE ON THE RELATIONSHIP BETWEEN
NEIGHBORHOOD QUALITIES AND TRANSPORT
WALKING: A COMPARATIVE STUDY BETWEEN IRAN
AND TÜRKİYE

A Master's Thesis

by
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June 2023

To my Family,
Homeyra, Reza, and Mohammad Arshia



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The Graduate School of Economics and Social Sciences of
İhsan Doğramacı Bilkent University

by

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I certify that I have read this thesis and have found that it is fully adequate, in scope and in quality, as a thesis for the degree of Master of Fine Arts in Interior Architecture and Environmental Design.

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ABSTRACT

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Encouraging walking as an active mode of transportation in daily trips can significantly contribute to the well-being of older adults. However, the literature, particularly in developing countries, has yet to explore this topic extensively. This thesis investigated the relationship between neighborhood qualities, motivations, preferences, and transport walking among older adults in Iran and Türkiye. Data from 172 participants in one hundred one neighborhoods across nine cities in Türkiye and eight cities in Iran were collected to examine the mediating role of motivations and preferences in this relationship in a two-phase study. While the findings from the first phase suggested no significant differences in mediating levels between the two countries, the second phase, which considered additional factors such as attitudes,

revealed some variations in motivation and preference factors of neighborhood. The study also explored the potential moderating effects of gender and neighborhood type but found no significant differences. These results contributed to a better understanding of the multifaceted factors influencing transport walking behavior in older adults, including cultural, demographic, attitudinal, and climatic factors. Despite limitations in sample size and duration of data collection, this study provided valuable insights for future research and urban planning initiatives aimed at creating age-friendly and walkable neighborhoods that promote the health and well-being of older adults.

Keywords: Attitudes, Climatical Factors, Culture, Neighborhood Qualities, Older Adults, Transport Walking, Walking Motivations, Walking Preference

ÖZET

MAHALLE NİTELİKLERİ İLE ULAŞIM YÜRÜYÜŞÜ ARASINDAKİ İLİŞKİDE MOTİVASYON VE TERCİHİN ROLÜNÜN ARAŞTIRILMASI: İRAN VE TÜRKİYE ARASINDA KARŞILAŞTIRMALI BİR ÇALIŞMA

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Günlük seyahatlerde aktif bir ulaşım yöntemi olarak yürümeyi teşvik etmek, yaşlıların refahına önemli ölçüde katkı sağlayabilir. Bununla birlikte, özellikle gelişmekte olan ülkelerde, literatür bu konuyu henüz yeterince araştırmamıştır. Bu tez, İran ve Türkiye'deki yaşlı bireyler arasında mahalle kalitesi, motivasyonlar, tercihler ve yürüyüş ile olan ilişkiyi incelemektedir. Türkiye'nin dokuz şehrindeki yüz bir mahallede ve İran'ın sekiz şehrindeki toplamda 172 katılımcının verileri, bu ilişkide motivasyonlar ve tercihlerin arabulucu rolünü incelemek için iki aşamalı bir çalışma kapsamında toplanmıştır. İlk aşama bulguları, iki ülke arasında arabuluculuk düzeylerinde anlamlı farklılıklar olmadığını göstermektedir, ancak ikinci aşama, tutumlar gibi ek faktörleri dikkate alarak farklılıklar ortaya koymuştur. Çalışma ayrıca cinsiyet ve mahalle tipinin potansiyel düzenleyici etkilerini araştırmış, ancak anlamlı bir etki bulunamamıştır. Bu sonuçlar, kültürel, demografik, tutumsal ve iklimsel

faktörler de dahil olmak üzere yaşlı bireylerin ulaşım yürüyüşü davranışını etkileyen çok yönlü faktörlerin daha iyi anlaşılmasına katkıda bulunmaktadır. Örneklem büyüklüğü ve veri toplama süresi gibi sınırlamalarına rağmen, bu çalışma, yaşlıların sağlık ve refahını destekleyen yaşlı dostu ve yürünebilir mahallelerin oluşturulması için gelecekteki araştırma ve kentsel planlama girişimlerine değerli bilgiler sunmaktadır.

Anahtar Kelimeler: İklimsel Faktörler, Kültür, Mahalle Kalitesi, Tutumlar, Ulaşım Yürüyüşü, Yaşlı Bireyler, Yürüyüş Motivasyonları, Yürüyüş Tercihi,

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LIST OF ABBREVIATIONS

CHAMPS	Community Healthy Activities Model Program for Seniors
GIS	Geographical Information Systems
GMP	German Mobility Panel
IPAQ	International Physical Activity Questionnaire
LUM	Land-use Mix
NEWS	Neighborhood Environment Walking Survey
NQ	Neighborhood Qualities
OOHB	Out-Of-Home Behavior
P. E. S. I. E	Point Estimate Standardized Indirect Effects
PA	Physical Activity
S. R. W	Standardized Regression Weights
SEM	Structural Equation Modeling
TW	Transport Walking
WFT	Walking For Transportation
WHO	World Health Organization

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CHAPTER 1

INTRODUCTION

1.1. Problem Statement and Aim of the Study

The World Health Organization (WHO) defines human health as physical, mental, and social well-being, not merely the absence of disease or infirmity (WHO, 2007). There are numerous ways to engage in physical activity (PA), including walking, biking, playing sports, and engaging in active leisure activities (Behnamifard et al., 2023). Among these ways, walking is a beneficial type of PA for the body because it is free and emits no greenhouse gases (Distefano et al., 2021). Nearly all people walk, which offers mobility, exercise, and enjoyment. Walkability refers to any aspect of urban planning and architecture influencing people's walking tendencies (Wang & Chen, 2023b).

Meanwhile, growing concerns are that cities will become less walkable as the world becomes more urbanized (Wang & Chen, 2023a). The phrase “neighborhood walkability” has been operationalized and measured in research over the past 20 years to embody environmental elements that support health, such as services, parks, and aesthetics (Asiamah et al., 2023; Wang & Chen, 2023a). According to the reasoning, creating a more pedestrian-friendly environment can encourage more people to walk by increasing pedestrian activity. Since walking is the most fundamental way for people to travel around, integrating with and experience urban areas, and engage in health-

improving physical activity, it has been linked to many social, health, and economic advantages (Distefano et al., 2023). A paradigm change in urban mobility toward active transportation is necessary to address the issues cities face in achieving their sustainability goals and addressing the climate crisis. Also, the COVID-19 pandemic highlighted the importance of the surrounding neighborhood environment in preserving people's lives and welfare throughout a pandemic. It allows us to reevaluate how we construct, plan, and govern our cities and neighborhoods and ensure we are equipped to safeguard everyone when the next emergency occurs (Ma et al., 2023). Cities worldwide are investing in infrastructure improvements to encourage pedestrian-friendly metropolitan areas (Distefano et al., 2023). Mainly in Western countries, the walking index (WI) and several audit scales are the primary measurement techniques mentioned in the literature (Wang & Chen, 2023a).

On the other hand, cities are also home to an essential percentage of the older adult population including three groups of sixty to seventy-four named young-old, seventy five to eighty-four named old, and above eighty-five named old-old (Ling et al., 2023). This percentage is more significant in some particular populations, such as older adults, going to 40% in many studies (Behnamifard et al., 2023). Walking as an active mode of transportation may help lower the incidence of coronary heart disease (Hu et al., 2007), type 2 diabetes (Hu et al., 2003), cancer, stroke, weight management, and all-cause mortality (Kim et al., 2023) in both men and women (Hatamzadeh & Hosseinzadeh, 2020). Despite these well-established health advantages, new estimates show that 25% of individuals still need to reach the WHO's recommended 150 minutes per week for PA. The interaction of three factors—built environment characteristics, psychosocial factors, and human aspects—leads to aging in place (Asiamah et al., 2023). Because they provide architectural and psychosocial environment characteristics

that support health-seeking behaviors across the life course, walkability plays a significant role in aging in place (Asiamah et al., 2023). The scale-driven and spatially based features for aging-in-place must be adjusted significantly given the apparent spatial unevenness and place-embedded implications of population aging today. The environments in which individuals age are unfriendly and difficult, posing possible obstacles to implementing or designing optimum aging-in-place (Ling et al., 2023). For health resilience thinking to align, it is necessary to have a comprehensive awareness of the connection between people and their environment. Enhancing the communities' physical, social, and service features is necessary (Ling et al., 2023). The 15-minute city and neighborhood concepts have been strongly supported for health promotion in several Chinese cities. As a result, defining and analyzing accessibility for local inhabitants in light of these principles would yield information that can be easily translated into helpful advice (Zhang et al., 2023).

Thus, to the author's knowledge, no comparison studies have been done in this area for a southwest Asian nation like Iran and Türkiye, despite the predicted growth in its aging population of 21.7% in 2050 in Iran (Behnamifard et al., 2023). To fill these gaps, the main aim of the thesis is to investigate how neighborhood qualities influence older adults' transport walking in Iranian and Turkish cities. Moreover, the study also has three sub-aims: (i) to analyze how motivation and preference mediate the relationship between neighborhood qualities and transport walking (ii) to explore how gender and type of neighborhood qualities moderate the relationship between motivation and neighborhood qualities; (iii) to analyze the moderator role of gender on the relationship between neighborhood qualities and preference.

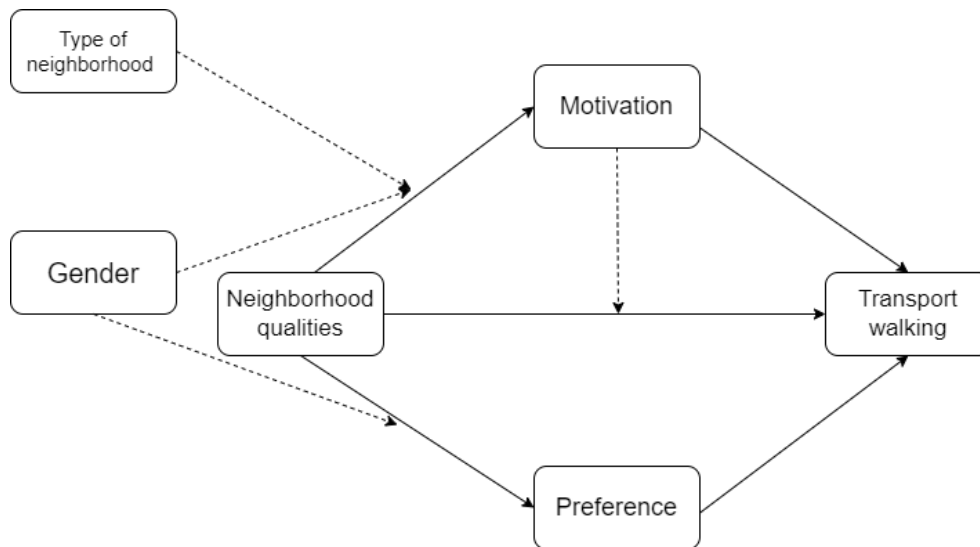


Figure 1. The conceptual model of mediators and moderators of transport walking (drawn by the author, 2023).

1.2. Structure of the Thesis

There are six chapters in this thesis. The problem statement, the purpose of the study, and the organizational structure of the thesis are all presented in the first chapter, which is also the introduction. The literature review is covered in Chapter 2 with the topics of the act of walking, walkability, neighborhood walkability, transport walking and the role of neighborhood qualities and individual characteristics, and older adults walking behavior, respectively. In Chapter 3, the methodology of the thesis is introduced and described. First, this chapter presents the research questions and hypotheses. The thesis's setting is then discussed to provide details about the neighborhood zones where the data was gathered. The participants, process, instruments, and data collection techniques were described afterward. The thesis results are addressed in Chapter 4 and discussed in Chapter 5. The conclusion section of Chapter 6 includes a summary of the

thesis' key points. Limitations and potential research directions are discussed in this chapter's conclusion. The conclusion is placed after the references and appendices.



CHAPTER 2

LITERATURE REVIEW

2.1. Act of Walking

Walking is described as moving forward on foot in Merriam-dictionary- Webster's (n.d.). Even though humans can crawl, we are bipedal mammals since we walk on two feet and move around primarily on two legs(Seles, 2021). The reasons Britannica Academic lists as potential drivers of human being bipedalism include carrying objects, wading to forage aquatic foods and avoid shoreline predators, vigilantly standing in tall grass, displaying phallic or other physical displays, following migrant herds on the savanna, and conserving energy (Encyclopædia Britannica, 2023). Since our ancestors began moving on two legs six million years ago (Amato, 2004), humans have moved from one location to another for various reasons. It was initially essential for both survival and movement. With the development of cities, people began to work more indoors and altered the geography. The need to climb, clomp, and stomp also disappeared along with the necessity of walking through difficult at times unstable, and steep terrain (Amato, 2004). With the development of new mobility technologies, walking in cities is now an option and not an obligation (Kärrholm et al., 2017). Walking is considered another active transportation option besides cycling; this cheap and environmentally beneficial exercise encourages a healthy lifestyle and lessens carbon dioxide emitted by moving around in cars (Seles, 2021). For 200 years,

walking has encompassed issues with health and recreation in addition to transportation and an assertion of one's lifestyle and social philosophy (Amato, 2004). Many reasons for walking have flourished inside the urban fabric: Transportation, recreation, visiting, and exercise (Kärrholm et al., 2017; Seles, 2021). However, in recent studies, there are two reasons: Walking for transport (i.e., walking to a location for a particular purpose), recreational walking (i.e., walking for entertainment) (Gao et al., 2020; Zuniga-Teran et al., 2017). Walking is a multidisciplinary study topic that encompasses investigations into urban planning, environmental design, and relationships between people and the environment (Seles, 2021).

2.2. What is Walkability?

Walking brings about changes. Those individuals drive themselves from one location to another. That change happens in both space and time (Seles, 2021). Walkability “Measure whether the built environment of a neighborhood encourages people to walk” (Wang & Yang, 2019, p. 43). It can be done alone or with others, requiring no specific clothing or equipment, and be done anytime (Zang et al., 2020). It is not merely a matter of personal desire or aptitude, but also a matter of opportunity and context, as walking is influenced by activities, people, and aspects of the built environment (Sarigöl, 2022). Urban walkability is a term that is used in urban planning and the creation of communities that are healthier, more environmentally conscious, prosperous economically, and socially involved. A new concept called "urban walkability" describes how hospitable and healthful an urban area is (Dovey & Pafka, 2020; Zuniga-Teran et al., 2017). According to Seles and Afacan (2019), an

effective built environment and positive behavioral intentions, such as walkability in residential neighborhoods, would enhance liveable communities and quality of life.

Considerable research on the relationship between the walkability of urban areas and their physical and social environments has been conducted in the previous ten years (Seles & Afacan, 2019). In order to explore the phenomenon, researchers used a variety of subject areas, models, theories, and frameworks. In the first study aimed at the relationship between walking and the built environment, 13 reviews from 2002 to 2006 were included together with 29 original studies published between May 2005 and May 2006 (Saelens & Handy, 2008). Bibliometric analysis and critical assessment of 136 papers from 2008 to 2018 on neighborhood walkability studies using Geographical Information Systems (GIS) were released by Wang and Yang (2019). Their research indicates that public, environmental, and occupational health is the most frequently studied subject. Other research fields include environmental sciences, ecology, general and internal medicine, geography, and transportation.

The absence of walking is also considered a global health issue (Seles, 2021). The World Health Organization (2007) emphasized encouraging walking and developing walkable communities to promote healthy lifestyles. Every person needs to engage in moderate-intensity physical activity for at least 30 minutes five days a week or more (Seles, 2021). Frank et al. said, “People are more likely to engage in moderate physical activity for about 30 minutes on a random day when they have multiple destinations near their residences and can get there in a straight pathway.” (2005, p. 122). Along with this aspect, other researchers question the validity of walking itself. To characterize walking behavior, anthropologists, political scientists, sociologists, psychologists, and other social scientists pose many issues. For instance, to establish a

pedestrian policy, the researcher would question the subject, “Why do you walk?” “What is a walk?” and “How do you walk?” to understand the action and the experience (Middleton, 2011). All of these inquiries provide the researcher with a lens through which to view the act of walking and a means of defining the issue.

2.3. Walking for Transport

Walking for transportation (WFT) is carried out to get to work, the store, public transportation, or a specific place. Much research has been done on the effects of many variables on walking behavior. This section highlights correlations between walking behavior, aspects of the built environment, and individual and household factors. The Ecological Model (Figure 2) approach provides a more profound understanding of various components at various levels, recognizing how these factors affect walking behavior (Sallis et al., 2006). The model below illustrates a dynamic and complex structure of variables affecting walking activities through layers that depict the various degrees of effect across several domains for an active lifestyle. Although each category is significant, this thesis primarily focuses on active transportation, specifically walking for transport.

Additionally, this thesis concentrated on the domain of mesoscale (such as the neighborhood environment) and micro level (such as the local individual surroundings). According to Kim, Park, and Lee (2014), the microenvironmental level describes the street level of walkability, including sidewalk quality, trees and flowers, air quality, cleanliness, safety, and other characteristics in the immediate individual

surroundings. The term "mesoscale level" refers to neighborhood-level variables frequently utilized in transportation studies of walkability and are typically connected to density, variety, and design (Kim et al., 2014).

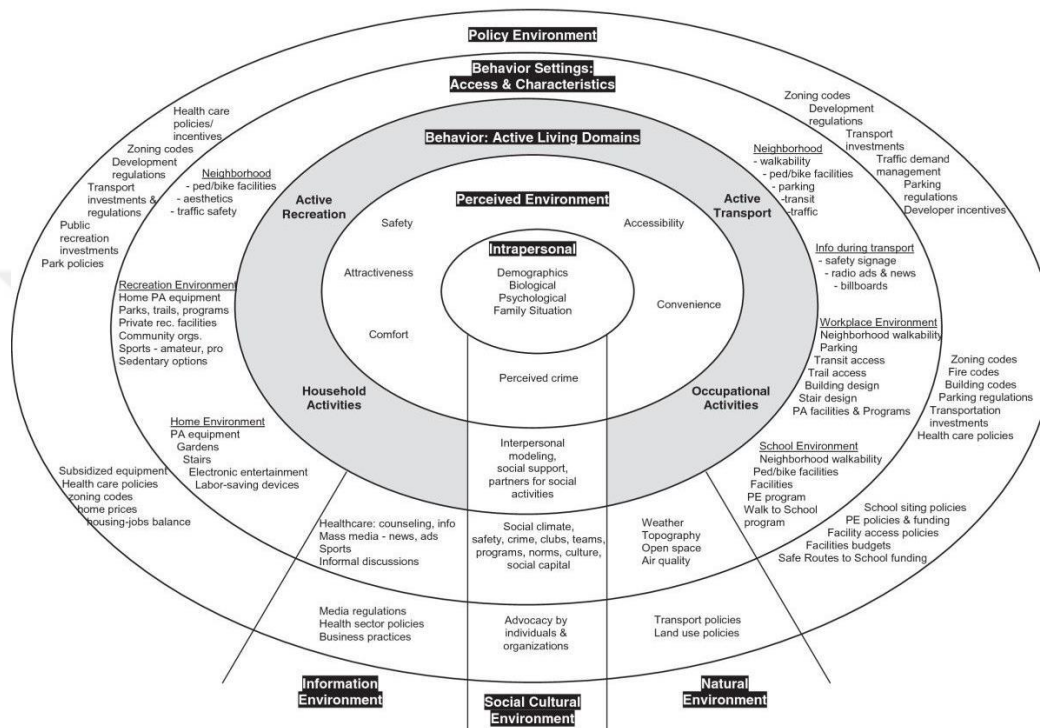


Figure 2: Ecological Model of the Four Domains for Active Living (Sallis et al., 2006).

2.4. Neighborhood Walkability

An area with comparable or uniform defining features, such as ethnicity, housing, and development type, is called a neighborhood (Gupta et al., 2012). Later, Sulaiman (2020) defined neighborhood as a region that is reachable on foot from one's home in 5 to 10 minutes. Both subjective interpretation and a very accurate official description

of a neighborhood can be used to define it (Sulaiman, 2020). An "age-friendly neighborhood" is one in which everyone, regardless of age, is treated with respect and is allowed to actively engage in community activities, according to the World Health Organization. It's a location that makes it simple for seniors to stay in touch with those who are significant to them. In addition, it supports those who are unable to care for themselves and helps people stay healthy and active even as they age (McDonald et al., 2021; WHO, 2018). In other words, according to this strategy, an age-friendly city is one that "encourages" active aging, which is defined as the process of maximizing possibilities for health, engagement, and security to improve quality of life as people age by the WHO (McDonald et al., 2021; Organization, 2002).

There are various reasons why people choose to walk, and each of these calls for different aspects and qualities in surroundings created in neighborhoods. It means that a walking person's environment and the changes have an impact. Numerous study fields have explored the walking person's surroundings and their causal link in depth and detail. As a result, walking is a multi-disciplinary study topic that includes studies of urban planning, environmental design, and people and environment connections. According to Kärholm et al., "studies of these kinds are performed in a wide variety of disciplines such as transport research, health research, environmental psychology, and urban studies." (2017, p. 21). From the environment and surrounding point of view, it is necessary to distinguish between various walking motivations to determine what pedestrians need from the built environment (Zuniga-Teran et al., 2017). Research showed a significant impact of urban neighborhoods on physical movement and activity.

Researches have looked into a variety of factors' effects. A rising amount of literature has emphasized the significance of built environmental elements, among other aspects (Hatamzadeh & Hosseinzadeh, 2020a). It has been suggested that the built environment of neighborhoods encourages older adults to walk. The "5D" features of density, diversity, design, accessibility to destinations, and distance to transit make up most of the built environmental elements (Cervero et al., 2009). Van Cauwenberg et al. (2014) chose older individuals as their study population. They discovered that comfortable, safe, and enjoyable environments might entice older persons to walk for transport (Van Cauwenberg et al., 2014).

2.4.1. The Role of the Neighborhood Qualities

Physical environments have been associated with being more active, however the majority of this evidence came from individual assessments of environmental factors (Leslie et al., 2007). In other words, some aspects of the built environment can encourage or discourage walking (Ribeiro & Hoffmann, 2018; Sarigöl, 2022).

Walkability indices quantify the impact of numerous environmental variables on walkability by considering observable neighborhood parameters in a composite way (Agampatian, 2014). In initial walkability paradigm, studies just aimed to find effective neighborhood qualities for walking. For example, Cervero and Kockelman (1997) introduced three key dimensions—density, diversity, and design. Later, Ewing and Cervero (2001) broadened their study by introducing dimensions for destination accessibility and travel time (Ewing et al., 2016).

In later environmental studies researchers were mostly concentrated on specific factors including local social control, aesthetic appeal, safety, and vegetation (Comstock et al., 2010; Lu et al., 2018; Rhodes et al., 2007). Also, several instruments, including indices and questionnaires, have been created for monitoring specified factors and their effect on walkability and physical activity (Zuniga Teran et al., 2015). Handy et al. (2002) tried to re-identification of the six aspects of the built environment by focusing on density and intensity, land-use mix (LUM), street connections, street scale, aesthetic attributes, and regional structure. Regarding the instrument usage, the first GIS-based composite walkability measure that incorporates LUM, connectivity, and residential density within a buffer around a residence was proposed by Frank et al. (2005). Later, urban planning and public health researchers highlighted the significance of precisely classifying and recording built environments (Agampatian, 2014; Leslie et al., 2007). The built environment has been recognized and assessed using D factors —density, diversity, design, destination accessibility, and distance to transit— in more than 200 research (Ewing et al., 2016). The Walkability Framework was also developed by Zuniga-Teran et al. (2016) and identifies nine elements of walkability: density, land-use mix, accessibility, traffic safety, surveillance, parking, experience, green space, and community. These nine categories cover physical activity, land planning, transportation, health, sustainable architecture, and urban design. This walkability paradigm has lately been applied to four neighborhood designs: conventional development, suburban development, stated communities, and cluster housing (Zuniga-Teran et al., 2016). Previous studies reached to a variety of results in this period. According to Rioux et al. (2016). Longer walks may be encouraged in large, central parks, while more diversified paths may be possible in smaller, more dispersed parks, which may be the result of appropriation

and incentive processes. So, relevant and reliable quantitative qualities are needed to understand how the built environment affects physical activity properly.

Using hard-copy auditing methods, the curiosity among scholars results in functional works on urban walkability. Moreover, in recent studies, digital implementations like Walkscore.comTM and Pedestrian Catch produce indices for that well-known field (Seles, 2021). For residential locations in Japan, Koohsari et al. (2018) looked into the association between Walk ScoreTM and empirically established neighborhood walkability metrics. They discovered it to be a reliable indicator of neighborhood walkability. Because there is a wealth of information accessible in the built environment of cities for assessing walkability, all these indices are feasible (Lee & Talen, 2014). Paykoç and Akış (2019) categorizes, identifies, and analyzes the background notion of analog and digital walkability evaluation instruments by criticizing their principles and core concepts. In a study conducted in Türkiye, urban neighborhoods generally offer more advantages for acquiring these criteria than freshly constructed urban areas. The case study areas conducted a comparative investigation. In comparison to the urban neighborhood situation, the suburban scenario better satisfies objective walkability criteria in terms of vehicle traffic flow, the number of crosswalks, the number of signs, the ground's condition, pavement width, and slope (Seles, 2021). Dovey and Pafka (2020) tried to study walkability through mapping methodologies, focusing on density, mixed-use, and accessibility as significant components of the walkability framework, and as a result "Walkability" was defined as an assemblage. In addition, a few academics have attempted to emphasize walkability as a transportation mode selection problem, using mapping and multi-criteria decision-making techniques (Luciano et al., 2020; Manzolli et al., 2021; Ortega et al., 2020). A recent study by Distefano et al. discovered four key elements

that affect users' propensity to walk, including the pedestrian path's quality, attractiveness, comfort, and safety (2023).

As a result, Dovey and Pafka (2020) emphasize how difficult it is to define and operationalize the concept of walkability. These walkability parameters vary, depending on the following factors: (i) the type of data used (e.g., qualitative, quantitative, GIS, objective, and subjective assessments of the urban environment); (ii) the method (e.g., audit instruments, levels of service indicators, checklists); (iii) the unit of analysis (e.g., pedestrian infrastructure, segment, or area); and (iv) the goal (e.g., to evaluate pedestrian structures, to assess (Ruiz-Padillo et al., 2018). Different indexes consider various components. For instance, Frank et al. (2010) used LUM, intersection density, retail floor space, and net residential density to create their index (Frank et al., 2010)

2.4.2. The Role of the Individual/Household Characteristics

Strategies to enhance walking for recreation or transportation have been emphasized as needing to consider elements at the individual level and those at the community level (Hearst et al., 2013). Age is a demographic factor whose impact on walking travel behavior has received the most significant attention. Studies on commuters revealed a favorable relationship between walking and age (higher age groups walk more) (Hatamzadeh et al., 2020b), while others found the opposite (Rodríguez & Joo, 2004). Age does not significantly impact women's propensity to walk during shopping

and errand journeys. It is also true for men, except for work trips, which demonstrate that men between the ages of 25 and 45 and 46 to 60 are significantly less likely to walk to work than men between the ages of 19 and 24. People over 60 appear with a positive sign in all models (except female shopping trips), demonstrating that seniors are more likely to shop than younger people (Hatamzadeh et al., 2020b).

Previous studies explain how household income and car ownership influence walking habits. Studies from many geographical areas demonstrate that lower-income groups are more likely to walk for transportation than higher-income ones (Hatamzadeh et al., 2020b). This argument was also made in a study of US citizens, where it was discovered that those with lower household incomes traveled farther for work than others (Yang & Diez-Roux, 2012). Likewise, according to research, walking is the preferred form of transportation for people with low incomes, particularly women, in urban areas of developing countries (Hatamzadeh et al., 2020b). According to other findings, compared to wealthier inhabitants, low-income groups' walking and driving habits are less influenced by neighborhood amenities in their immediate surroundings (Heroy et al., 2022). This finding contradicts earlier claims that people with low incomes are more in tune with their immediate surroundings regarding transportation habits. In an affluent neighborhood, amenities may be enough to encourage residents to walk more frequently. A case study in Türkiye discovered that those who do not drive walk more often than those who do for transportation inside their areas (Sarigöl, 2022).

According to Baker et al.'s research for Mumbai, poor households in Asian cities rely more on walking than other households (Hatamzadeh et al., 2020a). In general, it has been reported that having more cars available (in some studies, the number of vehicles

owned by households) harms choosing to walk to work (and, in some circumstances, a favorable impact on preferring to drive) (Hatamzadeh et al., 2020a; Rodríguez & Joo, 2004). Similar to studies on business travel, studies on shopping excursions have established that choosing to walk is strongly and negatively connected with vehicle availability (Hatamzadeh et al., 2020a).

Regarding the recent studies about gender, females were found to be more sensitive to walking distance than males during business trips. In contrast, males were found to be more adversely affected by distance during shopping trips. Male and female walking patterns were also more comparable when traveling to and from work than when shopping (Hatamzadeh et al., 2020b).

2.5. Older Adults Walking Behavior

Focusing on older adults' walking patterns who are above 60 years old is important because, as the global aged population grows, it will be challenging to meet their demands in the future, including those linked to health (Hatamzadeh & Hosseinzadeh, 2020a). Meanwhile, regular travel for various reasons, including work and shopping, is crucial for daily living and leading a healthy lifestyle. Numerous studies in medicine have found that walking benefits physical and mental health. By increasing overall physical activity, walking as an active mode of transportation may help lower the incidence of coronary heart disease (Hu et al., 2007), type 2 diabetes (Hu et al., 2003), cancer, stroke, weight management, and all-cause mortality (Kim et al., 2023) in both men and women (Hatamzadeh & Hosseinzadeh, 2020a). Despite the numerous advantages of walking, several studies indicate that older people in many nations walk substantially less frequently than persons of other ages (Keadle et al., 2016; Lavery et

al., 2015; Nordbakke, 2013). Another study found that older adults are less influenced by time restraints like driving young children or following rigid work schedules (Hatamzadeh & Hosseinzadeh, 2020a). The number of studies on older individuals' mobility has grown recently for the reasons described above. As a result, encouraging walking as a mode of transportation has recently drawn the attention of governments and healthcare professionals.

The WHO lists a few key areas related to the definition above and contributes to an age-friendly community. These areas include outdoor spaces and buildings, transportation, housing, social inclusion, participation, respect for others, civic engagement and employment, communication, information, community support, and health services (WHO, 2018). The neighborhood environment is especially crucial for older adults (60 and older) who experience a reduction in their available living space. It has been established that out of home behaviors are vital for older individuals' health and quality of life. OOHBs relate to various behaviors that occur when going from one place to another and participating in activities outside the house (Cao et al., 2019). The way public areas are created needs to be rethought/reconsidered to conform to their requirements and preferences if walking is to become an appealing, effective, and safe means of transportation for older adults. The more unable a person is, the more susceptible they are to external influences. A neighborhood's environment is physical and social (Distefano et al., 2021). While younger people who can navigate dangerous areas may benefit from walkable neighborhoods, if older adults are prone to anti-social conditions, they cannot sustain lifetime social involvement and the maintenance of good health in such communities. As a result, neighborhood walkability and its scales, which disregard the majority of those above psychological and personal aspects, might not accurately capture the best places for

aging in the overall scheme. Infrastructure in the community that is disability-friendly, social coherence, and social support are all latent in sociability, which could make the neighborhood a better place to age in place (Asiamah et al., 2023).

According to studies, the local accessible neighborhood is based on “the 15-minute city,” a goal for a more livable and healthy future that cities have announced (Logan et al., 2022). In a 15-minute city, residents may walk or ride their bikes from their homes to schools, retail establishments, leisure activities, and other vital amenities in under 15 minutes. The 15-minute city and neighborhood concepts have been strongly supported for health promotion in several Chinese cities. As a result, defining and analyzing accessibility for local inhabitants in light of these principles would yield information that can be easily translated into helpful advice (Zhang et al., 2023).

Several conceptions for a post-pandemic walkable neighborhood have recently arisen due to the COVID-19 pandemic, which has recently revitalized and increased focus on neighborhood amenities (Guzman et al., 2021; Moreno et al., 2021; Willsher, 2020; Yeung, 2021). People’s mental health has suffered significantly due to the COVID-19 pandemic, which has also highlighted the importance of the surrounding neighborhood environment in preserving people’s lives and wellness throughout a pandemic (Pierce et al., 2020). It presents an opportunity to reconsider how we design, plan, and manage our cities and neighborhoods and ensure we are better equipped to safeguard everyone when the subsequent disaster strikes. Additionally, the social milieu of the community affects how the pandemic will affect people’s mental health (Ma et al., 2023).

2.5.1 Neighborhood Factors Affecting Older Adults' Walking Behavior

A critical public health priority is making neighborhoods easier for senior citizens to navigate on foot. However, not all walking environments are designed with older adults in mind. Compared to other forms of PA, such as leisurely walking, the built environment has higher links with walking for transport (Distefano et al., 2021). Urban and suburban communities should work to meet the demands of an aging population since older persons have different social and physical needs.

Regarding neighborhood qualities, there are many studies. While some aspects like higher density neighborhood (Siren & Hakamies-Blomqvist, 2004), proximity to destinations/places (Rodríguez et al., 2009), and green spaces (Kemperman & Timmermans, 2014) which results in a higher frequency of walking among older adults, there are some others like spatial inequalities in neighborhood land-use intensity makes them walk less (Zandieh et al., 2017). The factor of mixed use is more effective than other environmental aspects like connectedness measurements (Hatamzadeh & Hosseinzadeh, 2020a). Also, People are more inclined to walk in an area where they believe there are complete sidewalks and public transportation is easily accessible, which enhances cognitive performance. The finding suggests that older persons who positively see their area are more likely to gain from an intervention that changes the infrastructure to promote walkability (Kim et al., 2023).

On the other side, it has been observed that climate change and the accompanying extreme weather events, such as heatwaves, rainstorms, hurricanes, landslides, and earthquakes, make life for older adults living in communities and other vulnerable people more challenging groups. The threat of neighborhood walkability from industrialization and climate change suggests that community-level PA may waste

time and limited resources. Older adults citizens are expected to live in neighborhoods as population aging accelerates along with industrialization and climate change. Older adults would so increasingly encounter obstacles to neighborhood services, parks, gardens, and other pedestrian resources (Asiamah, 2022).

Recently, older people have identified many critical elements of the neighborhood walking context, including safety features that guard against falls and traffic hazards, convenient access to destinations, well-maintained pedestrian infrastructure, neighborhood attractiveness, and public transportation (Distefano et al., 2021). When thinking about pedestrian paths, it is critical to distinguish between a route's length and intricacy. The level of service provided by the roadway and traffic environment, as well as the overall attractiveness of the environment, are some of the specific factors that may influence pedestrians' choice of route. These factors include distance or time, the number of obstacles or interactions with other pedestrians along the route, the directness of the route (i.e., the number of directional changes), and the level of service provided by the roadway and traffic environment (Distefano et al., 2021).

2.5.2 Individual Factors Affecting Older Adults' Walking Behavior

Following mentioned studies, researchers also attempted to address the question of how subjective elements like age, gender, lifestyle, culture and attitudes, beliefs and personality, and an individual's impressions of the built environment, in addition to land use attributes, could influence travel behavior in recent years (Hatamzadeh et al., 2020a). Regarding age, a study revealed that people typically travel less distance as they age (Wong et al., 2017). Particularly given that older adults' travel habits differ from those of other age groups in many distinctive ways (Hatamzadeh & Hosseinzadeh, 2020a).

Regarding gender, although some studies on walking have noted specific disparities between men and women, gender-based analysis on walking for transportation mainly

has not been addressed as it should. In the context of developing countries like Iran, where lifestyles have changed significantly over the past few decades. For instance, more women are enrolling in universities since there is a more considerable demand for women than for men in higher education. Many skilled females who can fill significant scientific and cultural positions have been produced due to the rise in educated women. Other indications of recent lifestyle changes include the increase in women's vehicle ownership and driver's license achievement. The travel habits of all family members, especially women who traditionally shoulder more domestic duties than males, have been impacted by these changes that have increased demand for outdoor activities (Hatamzadeh & Hosseinzadeh, 2020a).

According to the results, in contrast to old females, old males are more likely to walk as they age, whereas old females have a lower possibility of walking. This may happen for several reasons. Firstly, the unexpected outcome for old males may be a result of cultural differences. Secondly, this disparity might be caused by women having less car access than men, limiting their options. But the presence of a car in the home showed no discernible impact on older women in a recent study (Hatamzadeh & Hosseinzadeh, 2020a). Thirdly, compared to other travel features like time, mode, and frequency, according to research by Hatamzadeh and Hosseinzadeh (2020), the purpose of the trip is another factor that has no discernible influence on the walking habits of older women. On the other hand, among older men, traveling for work dramatically lowers the chance of walking compared to other purposes. Additionally, the findings indicate that taking a journey at particular times of day has no appreciable impact on senior women. However, older men are more likely to prefer walking while traveling between 8 and 10 in the morning than when traveling at other hours. These shifts and reasons of them have impacted the conventional roles of gender. However,

there is virtually little and inconsistency in research on walking as a mode of transportation. Nevertheless, this issue in Iran has recently received attention from several studies (Hatamzadeh et al., 2020b; Hatamzadeh & Hosseinzadeh, 2020a).

In a study by Frank et al., (2010) it was discovered that a person's decision to walk and travel distances is influenced by their attitude toward the type of neighborhood they reside in and the basic features of their built environment. The findings also demonstrate that, despite connection measurements significantly impacting walking behavior in other studies, older women did not choose to walk throughout their excursions (Hatamzadeh & Hosseinzadeh, 2020a).

Results regarding the influence of travel distance demonstrate that as the travel distance increases, the likelihood of choosing to walk decreases (Hatamzadeh & Hosseinzadeh, 2020a). Also, the total amount of walking during the work tour(s) significantly influences the interpretation of the walking behavior. In other research in China, there are some significant results. Firstly, the study's findings disprove the notion that older persons are more concerned with transportation options and instead highlight the impact of stop friendliness, access safety, and visual richness on walkability at the street level. Second, different people have different walking preferences. When rigid housing requirements are not considered, recreation willingness can more appropriately reflect the area's walkability (Wang & Chen, 2023b). However, few studies have examined the impact of attitudes on older adults' walking patterns and concluded that, after accounting for neighborhood preferences and attitudes, the built environment affects walking patterns (Hatamzadeh et al., 2020a).

According to the findings, a person's attitudes toward walking are significantly impacted by their unique spirits, such as worries about how they appear at work, which has a negative indirect impact on how much they walk (Hatamzadeh et al., 2020a). Studies in this field have concentrated on identifying the direct relationships between the explanatory variables and walking behavior without considering any mediating factors. For example, Coogan et al. (2012) examined the direct and indirect effects of attitudes/preferences toward a walkable neighborhood, urban form of the community, urban form of the residence, auto dependency, and satisfaction with the neighborhood on walking behavior in one recent exception, using a full-scale structural equation modeling (SEM). A few instances also used 'path diagrams' instead of the complete SEM. Positive attitudes were discovered to be the most significant mediating factor in the structural interactions between different variables. Additionally, the overall impact of having a happy mindset outweighed the destination zone's environmental qualities (Bagley & Mokhtarian, 2002; X. Cao et al., 2007; Hatamzadeh et al., 2020a). A study conducted in Iran shows that older adults are more likely to engage in PA in communities that foster a sense of belonging, inclusiveness, mutual aid, cognitive components, and social bonding. After family, belonging to an immediate community would be crucial in emotionally and physically engaging older adults. Persian culture places a high value on social contact. Older adults and retirees typically spend most of their spare time with friends and neighbors in parks, open areas, and places of worship (Behnamifard et al., 2023). Existing research also has shown that older persons' cognitive health benefits from having access to specific urban spaces and amenities like dining, cultural, recreational, and green space (Cérin et al., 2021; Fangfang et al., 2021).

Overall, it is possible to confirm that walkability is a particular problem of the researched area and that various local factors influence it in line with earlier studies (Distefano et al., 2023). Literature review showed that planners and policymakers must address the following issues to make cities more pedestrian-friendly: streets built exclusively to meet the needs of drivers; excessive travel distances caused by urban sprawl; and a lack of understanding of the needs of pedestrians, how they perceive the built environment, and how it affects their mode of transportation (Distefano et al., 2023). However, the literature examination reveals that while numerous trip measures have been employed to identify walking behavior, most research only used one measure for their analysis. The analysis shows that among the numerous explanatory elements, environmental factors have received the most attention, while the influence of subjective factors on walking behavior is relatively small, especially in developing nations (Heroy et al., 2022; F. Wang & Chen, 2023b; Zhang et al., 2019). Additionally, there are not enough studies examining factors' indirect effects, and most studies have mainly focused on their direct effects.

This study fills in gaps in the existing literature by evaluating direct and indirect effects of gender and neighborhood type from subjective factors and safety features, access to destinations, well-maintained pedestrian infrastructure, neighborhood attractiveness, and public transportation from environmental factors on frequency and duration of walking. Also, the reasons including car ownership, age, attitudes, income level, education and climate factors causing differences regarding walking preference and motivation between mentioned factors were examined.

CHAPTER 3

METHODOLOGY

3.1. Research Questions and Hypotheses

In this thesis, there are two main and four sub-research questions:

RQ1: Does preference has a different mediating level of transport walking in Iran and Türkiye?

RQ2: Does motivation has a different mediating level of transport walking in Iran and Türkiye?

RQ3: To what extent do socio-demographic factors moderate the relationship between preference and neighborhood qualities?

RQ4: To what extent is the relationship between motivation and neighborhood qualities moderated by socio-demographic factors?

RQ5: To what extent is the relationship between neighborhood qualities and transport walking moderated by motivation?

RQ6: Is walking duration correlated with motivation for older adults?

RQ7: Is there a correlation between walking frequency and older adults' motivation?

To achieve the objectives of the thesis, the following hypotheses are tested:

H1: Iran and Türkiye differ in mediating the relationship between neighborhood qualities and transport walking with motivation and preference.

H2: Gender moderates the impact of neighborhood qualities on motivation.

H3: The neighborhood type moderates neighborhood qualities' impact on motivation.

H4: Gender moderates the impact of neighborhood qualities on preference.

H5: There is a significant correlation between walking duration and frequency with older adults' motivation.

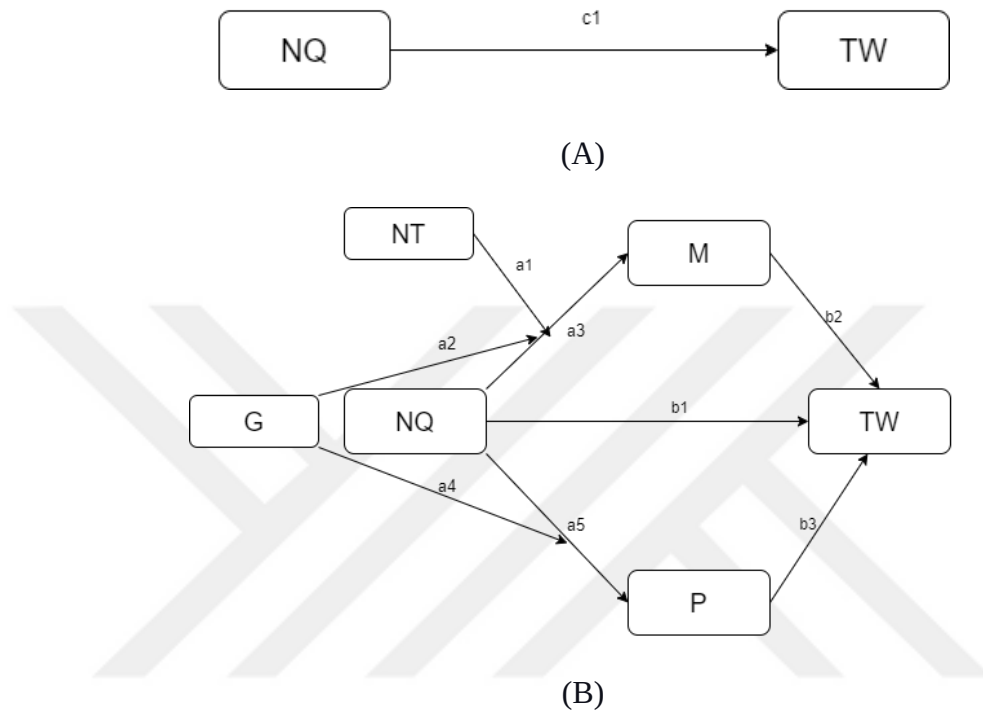


Figure 3. The statistical model; (A) Associations between neighborhood qualities and transport walking without mediators and moderators; (B) Associations between neighborhood qualities and transport walking with mediators and moderators (M represents the first potential mediator; Motivation. P represents the second potential mediator; Preference. NT represents the first potential moderator; Neighborhood type. G represents the second potential moderator; Gender. (Drawn by the author, 2023).

3.2. Selection of the site

The primary purpose of selecting these countries is to compare their walkability since the older adult population in both countries as developing countries is increasing rapidly. According to the literature review, since it is essential to design pedestrian-friendly cities, and due to the differentiation in country subdivisions between the two countries, metropolitan cities of each country with physical development and high population growth rate were considered site areas.

This study was conducted in the urban areas of Iran and Türkiye. Data was gathered from residents of forty-two neighborhoods from eight cities in Iran and fifty-nine neighborhoods from nine cities in Türkiye between January 1, 2023, and April 1, 2023. These two countries were chosen for their cultural differences, neighborhood qualities, motivations, and preferences. The population survey data of 2011 revealed a significant demographic change in Iran's older adult population (the percentage of the older adult population increased from 7.27% to 8.20% from 2006 to 2011 and 8.65% in 2016). In 2025, 10.5% of the population will be over 65; This percentage will rise to 21.7% by 2050 (Noroozian, 2012). According to data from the Turkish Statistical Institute (TÜİK), the aging population in Türkiye has grown by 24 percent over the past five years, showing that the aging issue consistently affects the nation (Turkstat, 2019).

As a result of snowball sampling, in Iran, the following eight cities were chosen as sites: Sari City in Mazandaran Province, Bojnourd City in North Khorasan Province, Shahreza City in Esfahan Province, Karaj City in Alborz Province, Shiraz City in Fars province, Tabriz City in East Azarbaijan Province, Tehran City in Tehran Province, and Zanjan City in Zanjan Province (See Figure 4). In Türkiye, nine cities were

chosen as site areas: Ankara, Antalya, Edirne, Eskişehir, Isparta, Istanbul, İzmir, Izmit, and Van (See Figure 5).

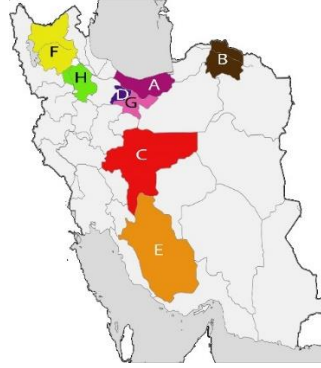


Figure 4. Map of Iran illustrating chosen Provinces. A) Mazandaran; B) North Khorasan; C) Esfahan, D) Alborz, E) Fars, F) East Azarbaijan, G) Tehran, H) Zanjan (Drawn by the author, 2023).

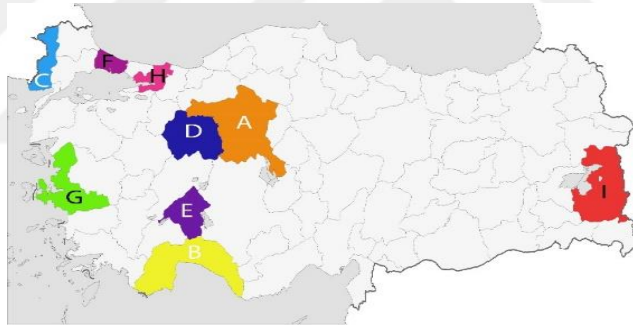


Figure 5. Map of Türkiye illustrating chosen cities. A) Ankara; B) Antalya; C) Edirne; D) Eskişehir; E) Isparta, F) Istanbul, G) İzmir, H) Izmit; I) Van. (Drawn by the author, 2023).

In Ankara, as shown in Figure 6 (See Appendix E), participants were from six different districts; Çankaya, Yenimahalle, Altındağ, Gölbaşı, and Keçiören. In the Çankaya district, twenty neighborhoods (See Figure 7, Appendix E), in Yenimahalle, four neighborhoods (See Figure 8, Appendix E); and in Altındağ, Gölbaşı, and Keçiören, one neighborhood was chosen (See Figures 9, Appendix E). In Antalya, participants were from the three neighborhoods of Muratpaşa district (See Figures 10

and 11, Appendix E). In Edirne, there were participants from the Edirne Merkez district (See Figure 12, Appendix E) and the Şükrüpaşa neighborhood (See Figure 13, Appendix E). In Kocaeli, participants were from the Doğan neighborhood of the İzmit district (See Figures 14 and 15, Appendix E). In Eskişehir, the participants were retrieved from the Kırmızıtoprak neighborhood of Odunpazarı district. (See Figures 16 and 17, Appendix E). From Isparta, Sütçüler district (See Figure 18, Appendix E), there was a participant from Sarımehmetler (See Figure 19, Appendix E). In Istanbul, from five neighborhoods (See Figure 20, Appendix E) of five different districts (See Figure 21, Appendix E), there were participants. There were participants from two neighborhoods from two different districts of Izmir (See Figures 22 and 23, Appendix E). Finally, from Van, there was a participant from the Cumhuriyet neighborhood of Cumhuriyet district (See Figures 24 and 25, Appendix E).

There were participants in Iran from Sari City in Mazandaran province (See Figure 26, Appendix E) and Bojnourd City in North Khorasan province (See Figure 27, Appendix E). In Alborz province from Karaj city, participants were from two neighborhoods from two districts (See Figure 28, Appendix E). Fars province also had participants from Shiraz City (See Figure 29, Appendix E). There were two neighborhoods in Tabriz city from East Azerbaijan province (See Figure 30, Appendix E). There were participants in Tehran from six neighborhoods (See Figure 31, Appendix E) of four different districts (See Figure 32, Appendix E). As shown in Figure 33, Zanzan was one of the provinces (See Figure 34, Appendix E) with the most participants from different neighborhoods. In addition, there were participants from Shahreza City of Esfahan province (See Figure 35, Appendix E).

3.3. Participants

Before beginning the survey, permission from Bilkent University's ethics committee was required to work with inhabitants of Iranian and Turkish older adults above 60 years old (See Appendix A). The committee received a paper outlining the thesis' objectives and methods and information on the participants, process, tools, and resident consent form. The consent form details the thesis's aims, methodology, advantages, and confidentiality concerns. To satisfy the minimum participant number, G*Power studies were performed. It was found that the minimum participant number is 77 in both countries, making a total of 154 participants. The survey study enrolled a total of 94 participants from Iran and 78 participants from Türkiye. Snowball sampling methods were used for choosing the respondents. Then, for the qualitative phase of the study minimum participant number of 5 was considered to have participated voluntarily from the people who participated in the survey (Krueger & Casey, 2002). Finally, eight participants participated from Iran and eight participants from Türkiye. In both countries, participants completed the survey by mail, online, or phone call. Computer-Assisted Web and personal interviewing (CAWI and CAPI) were used during the qualitative phase.

3.4. Procedure

The thesis was comprised of two phases. The first phase is the quantitative phase, in which the first step was a literature review on older adults' transport walking in Iran and Türkiye. In the second step, data were collected through a survey process. A survey questionnaire consists of three sections filled out via Google Forms. The first

section concerns demographic questions, including age, gender, income level, car ownership, health status, and education. Then in the second section, a self-reported walking assessment for transport frequency and duration was asked. The third section was the neighborhood walking assessment level which consisted of neighborhood qualities questions, including comfort and safety, land mix use, access to the facilities, connectivity of the streets, infrastructure for walking, and aesthetics. In the third step, collected data were analyzed.

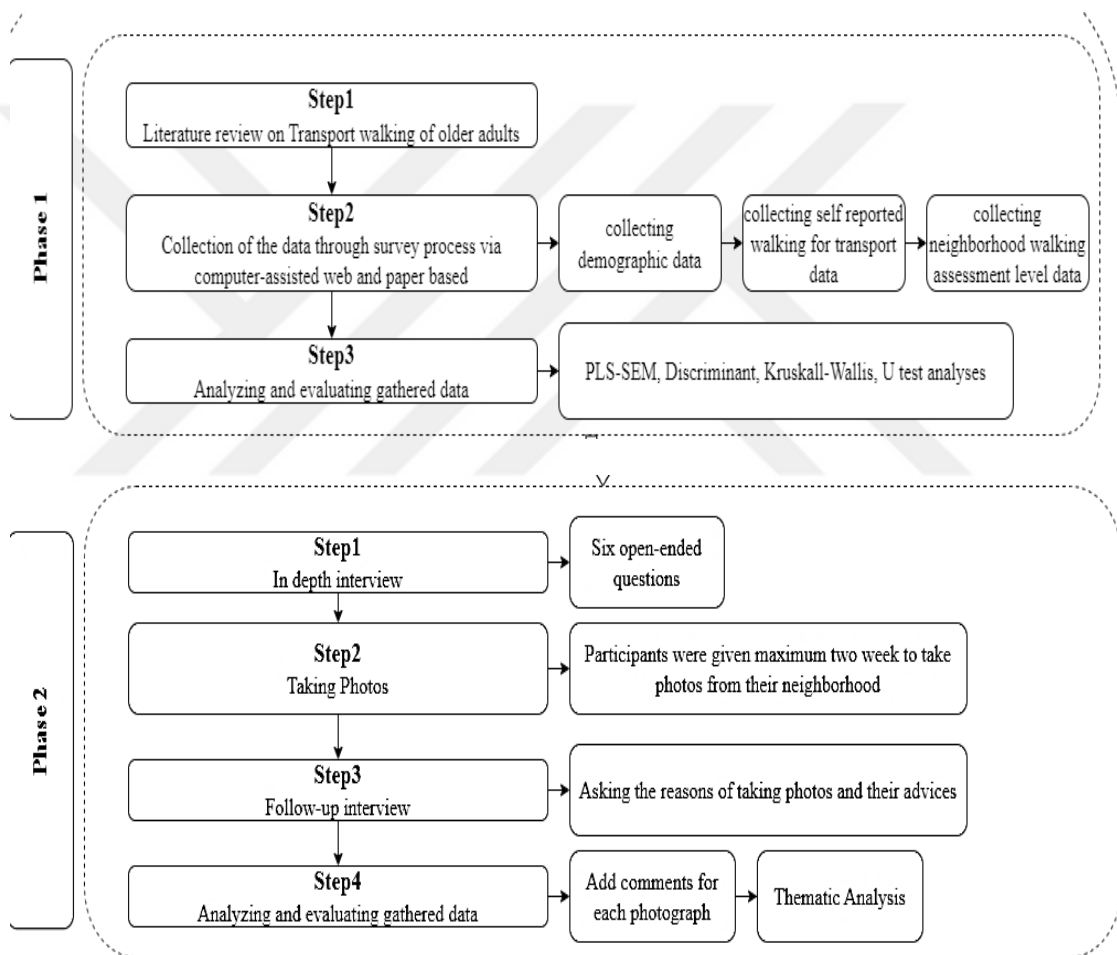


Figure 36. Process chart (Drawn by the author, 2023).

The second phase was conducted with the volunteers of the first phase. In the second phase, which was the qualitative phase, photo-voice was used in combination with focus groups. In the first step, an in-depth interview with the six following open-

ended questions was done: “**Q1:** Why do you walk/ not walk?”, “**Q2:** For which benefits do you walk”, “**Q3:** Which Neighborhood qualities associate with your walk/ not walk?”, “**Q4:** What sort of facilities motivate you to walk more? (Institutional, recreational, etc.)”, “**Q5:** Is there any weather or climatic reason that makes you walk/not walk?”, “**Q6:** Is there any cultural reason that makes you walk/not walk?”. In addition, their work status, housing type, residential length, self-assessed health, walking frequency in the neighborhood, and walking aid status were asked. Then, participants were given two weeks to take photographs of any obstacles, physical barriers or motivators, and favorite places in their neighborhood with their phones in the second step. In the third step, the follow-up interview was conducted. The interviewer asked the participant to select the most meaningful photograph regarding neighborhood qualities that encourage or discourage them from walking. The interviewer then asked the participant a series of questions about the photo, such as: “**Q1:** Please explain why you took this picture” and “**Q2:** What do you see here?”, “**Q3:** What is happening?”, and “**Q4:** What can we do?”. The fourth step is analyzing.

3.5. Instruments

The study consisted of two phases. In the first phase, some instruments were used to design the questionnaire; in the second phase, two instruments were used to conduct the survey and analyze the data.

3.5.1 The Instruments of the Quantitative Phase

The thesis used the following three questionnaires: International Physical Activity Questionnaire (IPAQ) (Craig et al., 2003), Neighborhood Environment Walking Survey (NEWS) (Saelens et al., 2003), and Community Healthy Activities Model Program for Seniors (CHAMPS) (Stewart et al., 2001). Since the data were collected in Iran and Türkiye, where English is not the first language, one native and one expert and experienced individual in the topic translated the English version into Turkish and Persian. Then two other native and expert individuals back-translated the Persian and Turkish translations into English, and the first English version of the questionnaire and the last one was compared to be the same. The survey consisted of three parts: demographic questions, self-reported walking for transport, and neighborhood walking assessment level, which were collected through Google Forms. The demographic questions included age, gender, education, income level, car ownership, marital status, neighborhood type, city, and neighborhood name. Self-reported walking for transport was asked through seven questions. The neighborhood walkability assessment was asked through twenty-two questions and scored using the original 4-point Likert Scale from 1 (strongly disagree) to 4 (strongly agree). Table 2 lists the seven questions (See Appendix B).

3.5.2. The Instruments of the Qualitative Phase

In the qualitative part, the survey consisted of three parts: an in-depth interview, a photo-voice, and a follow-up interview. In in-depth interviews, work status, housing

type, residential length, self-assessed health, walking frequency in the neighborhood, and walking aid were included since there is strong empirical evidence on the socio-economic and personal characteristics affecting well-being. Health was measured as a single-item self-assessment on a 4-point Likert Scale ranging from very unhealthy (0) to healthy (4). Also, six open-ended questions were asked to discover encouraging and discouraging factors and walking goals.

A qualitative visual research technique, photovoice, uses participant-taken images to analyze and address participants' lived experiences (Rose, 2022). To offer fresh perspectives and express the "feel" of particular events or locales, which is frequently lost with research methodologies focusing solely on oral or written data, photovoice invites participants to take images as a way of recording and to communicate a phenomenon (Mysyuk, 2020; Rose, 2022). In this stage, participants were asked to take photos of motivators, barriers, and destinations in their neighborhood, smartphones were used to take pictures, and Adobe Photoshop to edit them. Six open ended questions were asked in the follow-up interview to get more details about the photos taken. Finally, thematic analysis was used to analyze data from this phase. It is a simple, adaptable, and widely used technique for analyzing qualitative data to interpret the meaning in the text or image (Braun & Clarke, 2012; Guest et al., 2011).

3.6. Data Analysis

3.6.1 Quantitative Analyses

The Statistical Package for the Social Sciences (SPSS), IBM V.26, and SMART-PLS software were used for data analyses. Since the distribution of the data is not normal,

the Kruskal–Wallis and the Mann–Whitney tests were used instead of One-way ANOVA to determine whether samples come from the same distribution. Also, Spearman's rank correlation test was used to evaluate how well a monotonic function may be used to represent the relationship between two variables. Furthermore, the discriminant analysis identifies a linear combination of attributes that distinguishes between two or more groups of things or occurrences or describes them. Also, the gathered data in the quantitative phase were analyzed and evaluated through the Partial Least Squares (PLS) approach of Structural Equation Modeling (SEM), which has two steps. The current study used the two-stage technique suggested by Henseler et al. to report PLS-SEM results. 'Measurement model assessment' is the name of the first phase. 'Structural model assessment' is the name of the second phase.

3.6.2 Qualitative Analyses

To analyze the photovoice method, a thematic analysis was conducted to identify standard inductive and deductive codes in two themes of encouraging and discouraging neighborhood factors based on the interview notes to accompany each photograph of the focus-group sessions.

CHAPTER 4

RESULTS

4.1. Survey Analysis

4.1.1. Descriptive Analysis

Participants were asked to provide information on their age, gender, education level, income level, car ownership, and neighborhood type in both countries (See Table 1). This information was collected to ensure the surveys were conducted with individuals who met the specified criteria. The age range of the participants was between 60 and 74, with an average age of 69.94 (SD = 6.445). In Iran, there were 94 participants, with 60.6% being females and 39.4% males. In Türkiye, there were 78 participants, with 52.6% females and 47.4% males. Most participants in both countries were married, with 79.8% in Iran and 69.2% in Türkiye. Regarding education level, most Iranian participants had a high school education (41.5%), while Turkish participants had a university or higher education level (41%).

The results also revealed that a significant proportion of participants in both countries had an income level twice the minimum wage, with 53.2% of Iranian participants and 43.6% of Turkish participants falling into this category. Additionally, 43.6% of Iranians and 48.7% of Turkish participants owned a car. The majority of

participants from Iran (78.7%) and Türkiye (62.8%) resided in urban centers (See Table 1).

Table 1. Descriptive characteristics of participants from both countries.

Demographic Characteristics	Total= 172	
Age Group	Iran (94)	Türkiye (78)
60-74	83% (78)	71.8% (56)
75-85	11.7% (11)	26.9% (21)
Above 85	5.3% (5)	1.3% (1)
Gender		
Female	60.6% (57)	52.6% (41)
Male	39.4% (37)	47.4% (37)
Marital Status		
Single	0% (0)	6.4%
Married	79.8% (75)	69.2%
Widow	20.2% (19)	24.4%
Education Level		
Primary school & below	20.3% (19)	29.5% (23)
Middle school	9.6% (9)	7.7% (6)
High school	41.5% (39)	21.8% (17)
University & above	28.7% (27)	41% (32)
Income Level		
Minimum Wage & below	31.9% (30)	32.1% (25)
Twice the Minimum Wage	53.2% (50)	43.6% (34)
Three times the Minimum Wage	8.5% (8)	11.5% (9)
Above Three times the Minimum Wage	6.4% (6)	12.9% (10)
Car Ownership		
I own a car	43.6% (41)	48.7% (38)
I do not own a car	56.4% (53)	51.3% (40)
Neighborhood Type		
Urban Center	78.7% (74)	62.8% (49)
Suburban	21.2% (20)	38.2% (29)

4.1.2. Analyzing Differences in Transport Walking Behavior Concerning Demographic Variables in Iran and Türkiye.

The thesis utilized non-parametric tests, the Mann–Whitney U and the Kruskal–Wallis test, to examine associations between demographic and transport walking variables.

The Kruskal–Wallis test was conducted to determine the impact of age groups, education level, income level, and neighborhood type on transport walking frequency and duration. The results in Iran revealed a significant difference in walking frequency ($p = 0.046$) among different age groups and in walking duration between different income levels ($p = 0.030$). However, there were no significant differences in walking frequency and duration based on education levels and neighborhood types. On the other hand, in Türkiye, a significant difference was observed in walking duration based age ($p = 0.005$). No significant differences were found in walking frequency and duration among different education levels, neighborhood types, and income levels (See Table 2).

Table 2. Results of the Kruskal-Wallis test for differences in walking frequency and duration across different demographic categories.

	Iran		Türkiye	
	Frequency	Duration	Frequency	Duration
Age group				
Kruskal-Wallis H	6.163	2.271	0.053	10.721
df	2	2	2	2
Asymp. Sig.	0.046	0.321	0.974	0.005
Education				
Kruskal-Wallis H	6.974	9.949	6.775	5.283
df	6	6	6	6
Asymp. Sig.	0.323	0.127	0.342	0.508
Income Level				
Kruskal-Wallis H	2.907	10.697	7.559	5.280
df	4	4	4	4
Asymp. Sig.	0.574	0.030	0.109	0.260
Gender				
Kruskal-Wallis H	0.521	0.200	1.356	13.004
df	1	1	2	2
Asymp. Sig.	0.470	0.654	0.508	0.002

A Mann-Whitney U test assessed whether the walking frequency and duration varied based on gender and car ownership. The results indicated a significant difference in walking duration based on gender ($p = 0.002$) in Türkiye. However, no significant difference was observed between gender or car ownership and the variables of walking for transport in Iran (See Table 3).

Table 3. Results of Mann-Whitney test for differences in walking frequency and duration across gender and car ownership categories.

	Iran		Türkiye	
	Frequency	Duration	Frequency	Duration
Gender				
Mann-Whitney U	962.500	998.000	662.500	448.000
Wilcoxon W	1665.500	2651.000	1523.500	1309.000
Z	-0.722	-0.448	-0.981	-3.158
Asymp. Sig. (2-tailed)	0.470	0.654	0.327	0.002
Car ownership				
Mann-Whitney U	1048.000	933.000	757.500	654.000
Wilcoxon W	2479.000	2364.000	1577.500	1474.000
Z	-0.298	-1.198	-0.026	-1.077
Asymp. Sig. (2-tailed)	0.766	0.231	0.980	0.281

4.1.3 Determining Neighborhood Qualities' and Demographic Factors' Effect on Transport Walking in Iran and Türkiye.

Spearman's rank correlation was computed to examine the relationship between neighborhood qualities and walking frequency and duration.

In Türkiye, walking frequency showed a significant positive relationship with walking and cycling trails ($r(78) = 0.342$, $p = 0.002$) and alternative routes ($r(78) = 0.297$, $p = 0.008$). However, in Iran, there was a negative correlation between walking frequency and walking and cycling trails ($r(94) = -0.247$, $p = 0.016$). Additionally, in Türkiye, place preference for walking ($r(78) = 0.264$, $p = 0.020$), places and stores ($r(78) = 0.290$, $p = 0.010$), and the existence of street lights ($r(78) = 0.229$, $p = 0.044$) showed a positive relationship. On the other hand, the presence of hilly streets ($r(78) = 0.248$, $p = 0.029$), specific places and facilities such as job locations ($r(78) = -0.226$, $p =$

0.047), pharmacies ($r(78) = -0.283, p = 0.012$), and supermarkets ($r(78) = -0.273, p = 0.016$) exhibited a negative correlation. In Iran, parks showed a positive correlation ($r(94) = 0.211, p = 0.041$) (See Tables 4 and 5).

Table 4. Spearman rank order correlation results of neighborhood qualities' effect on walking frequency in Türkiye.

	Walking Frequency		
	Correlation Coefficient	Sig. (2-tailed)	N
Place preference	.264	0.020	78
Supermarket (Facilities)	-.273	0.016	78
Pharmacy (Facilities)	-.283	0.012	78
Job (Facilities)	-.226	0.047	78
Places and stores (Access to services)	.290	0.010	78
Hilly streets (Access to services)	-.248	0.029	78
Alternative routes (Streets)	.297	0.008	78
Pedestrian trails (Places for walking and cycling)	.342	0.002	78
Street lights (Safety from traffic)	.229	0.044	78

Table 5. Spearman rank order correlation results of neighborhood qualities' effect on walking frequency in Iran.

	Walking Frequency		
	Correlation Coefficient	Sig. (2-tailed)	N
Park (Facilities)	.211	0.041	94
Pedestrian trails (Places for walking and cycling)	-.247	0.016	94

Walking duration shows a significant positive correlation with income level ($r(78) = 0.315$) and environment preference for walking ($r(78) = 0.348$) in Iran. In Türkiye, it has a significant positive correlation with the existence of alternative routes ($r(78) = 0.321, p = 0.004$). Moreover, in Türkiye, there is a positive correlation between walking duration and environment preference ($r(78) = 0.555, p < 0.001$), access to places and stores ($r(78) = 0.238, p = 0.036$), the existence of trees ($r(78) = 0.231, p = 0.042$), and the existence of street lights ($r(78) = 0.243, p = 0.032$). On the other hand, age in Türkiye shows a negative correlation ($r(78) = -0.255$) (See Tables 6 and 7).

Table 6. Spearman rank order correlation results of neighborhood qualities' effect on walking duration in Türkiye

	Walking Duration		
	Correlation Coefficient	Sig. (2-tailed)	N
Place preference	.555	0.001	78
Places and stores (Access to services)	.238	0.036	78
Alternative routes (Streets)	.321	0.004	78
Trees (Surroundings)	.231	0.042	78
Street lights (Safety from traffic)	.243	0.032	78

Table 7. Spearman rank order correlation results of neighborhood qualities' effect on walking duration in Iran.

	Walking Duration		
	Correlation Coefficient	Sig. (2-tailed)	N
Place preference	.348	0.001	94
Alternative routes (Streets)	.223	0.031	94

4.1.4. The Mediators and Moderators of Older Adults' Transport Walking Analysis

Structural Equation Modelling (SEM) was used to assess the data. The SEM analysis was carried out using two-stage approaches recommended by Hair et al. (2010) through AMOS24. In this thesis, where the indicators of constructs are presumed to be caused by latent variables, reflective measurement scales were used. Numerous goodness-of-fit indicators (fit indices) were used to evaluate the overall model fit, including the Chi-square test statistic, relative Chi-square (2/df) ratio, and the Goodness of Fit Index (GFI), a measure of fit between the proposed model and the observed covariance matrix, with a value greater than 0.90 indicating an acceptable fit (Hair et al., 2010; Kline, 2023). The Comparative Fit Index (CFI) and Incremental Fit Index (IFI) are incremental fit indices with values equal to or greater than 0.90 (Ho, 2006; Scumacker & Lomax, 2010). As recommended by Hair et al. (2010, p. 709), the convergent validity was evaluated using three criteria: (1) the sufficiency of factor loadings (more than 0.5), and (2) Composite reliability (CR) of more than 1.96 for the measure variables. The second step tests the latent variables and squared multiple correlation coefficients (R²) for causal connections using a structural model. To examine the indirect/mediation influence of motivation and preference on the relationship between transport walking as the dependent variable and neighborhood qualities as the independent variables in the integrated model, the "Bootstrap" approach was employed. Bootstrap calculates confidence ranges for the point estimate and the size of the indirect effect's statistical significance (Mallinckrodt et al., 2006).

The confirmatory factor analysis (CFA) technique was used in this research to examine the construct validity. Results showed that the structured models based on a set of goodness-of-fit indices provided an appropriate fit. The CFI, IFI, and GFI significantly for both Iran (See Figure 37 A) and Türkiye (See Figure 37 B) structured models passed the cut-off value (0.9). The results of assessed convergent validity showed that all the items standardized factor loading in the models in both countries was significant at 0.004 alpha level (See Figure 37). Furthermore, the surrounding in Iran ($\beta=0.76$) and walking and cycling places in Türkiye ($\beta=0.88$) were the most significant influential factors of the neighborhood variable.

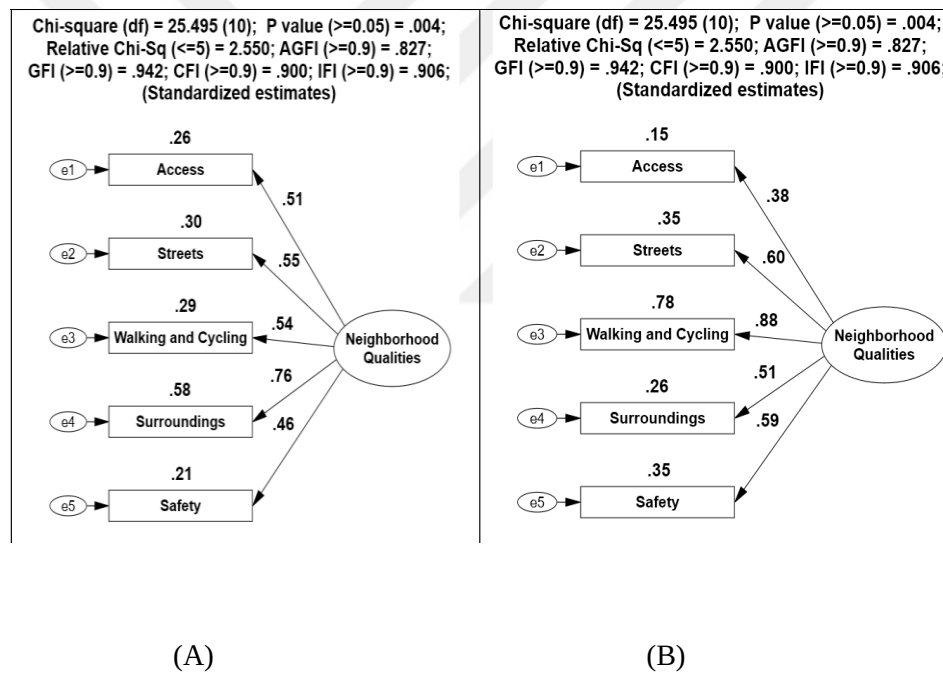


Figure 37. Confirmatory factor analyses (CFA) for neighborhood qualities; (A) Iran standardized model; (B) Türkiye standardized model.

In the first path model, as shown in Figure 38, neighborhood qualities' direct effect on transport walking was analyzed without considering mediators and moderators. The goodness-of-fit indices showed that the estimated structural model based on the statistical goodness-of-fit indices had a satisfactory fit to the data. The results in Table 8 demonstrated that neighborhood qualities positively correlated with transport walking in Türkiye ($\beta = 0.29$, Sig. = 0.007). It had no statistically significant relationship with transport walking in Iran.

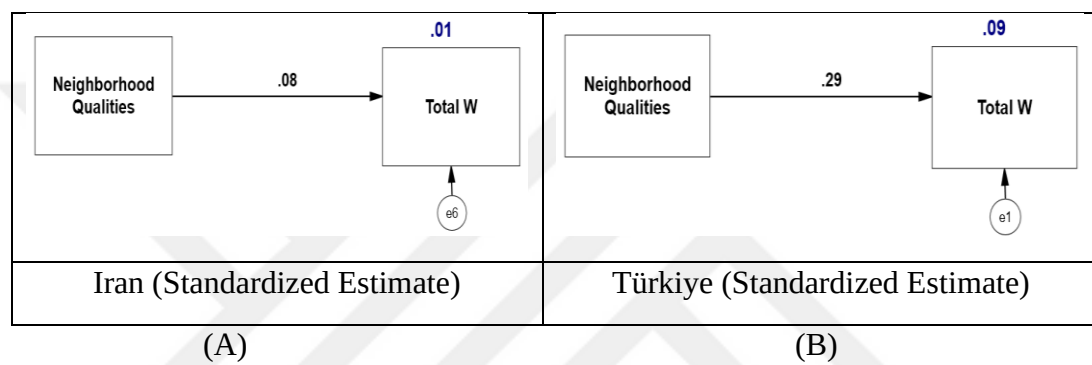


Figure 38. Significance testing results of the path 1 structural model; (A) Iran; (B) Türkiye.

Table 8. The result of the hypothesized path model 1

Country	Path	Estimate	S.E.	S.R.W	C.R.	P
Iran	NQ → TW	1.001	1.36	.0759	.7336	.463
Türkiye	NQ → TW	3.95	1.47	.2925	2.685	.007

Note. S.E. = Standardized effect, S.R.W= Standardized Regression Weights, C.R.= Composite reliability

The goodness-of-fit indices showed that Iran and Türkiye's second estimated structural models, based on the statistical goodness-of-fit indices, had a satisfactory fit to the data. According to Iran's structural model, the squared multiple correlations (R^2) coefficient of the dependent variables of transport walking, preference, and motivation, respectively, was 0.04, 0.03 and 0.02, which indicated that 4% and 3%,

and 2% of the variances of the transport walking, preference, and motivation, respectively, were explained by the studied constructs in the model (See Figure 39 A). According to the Türkiye structural model, the squared multiple correlations (R^2) coefficient of the dependent variables of transport walking, motivation, and preference, respectively, was 0.35, 0.06, and 0.01, which indicated that 35%, 6%, and 1% of the variances of the transport walking, motivation, and preference, respectively, were explained by the studied constructs in the model (See Figure 39 B). Moreover, the result in Table 9 demonstrated a statistically significant relationship between Iran's variables. However, in Türkiye, there is a positive relationship between neighborhood qualities and transport walking ($\beta = 0.35$, Sig. = .000). There is another positive relationship between preference and transport walking ($\beta = 0.52$, Sig. = 0.000). Therefore, H5 was not supported in this structural model of both countries.

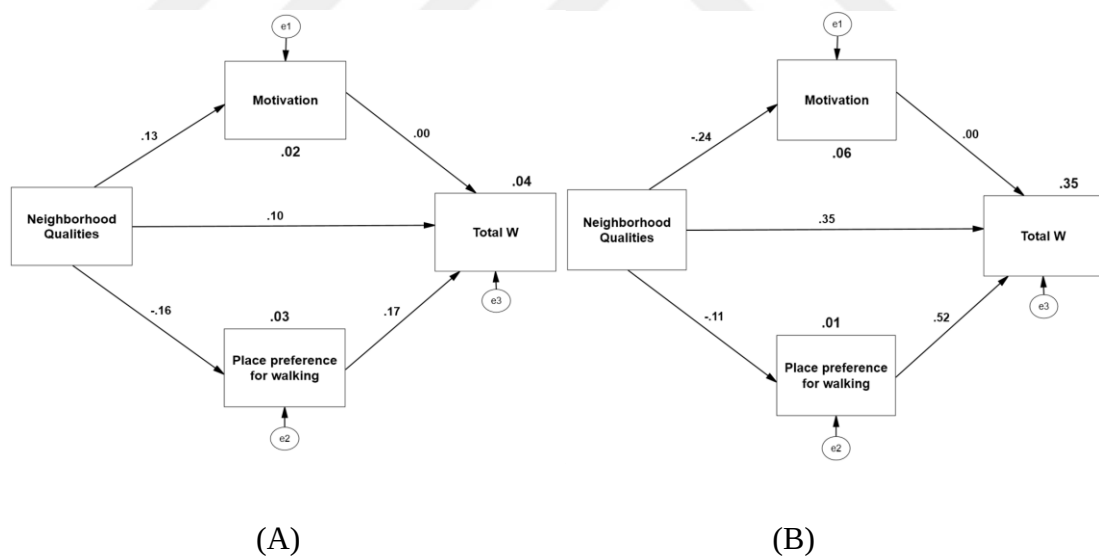


Figure 39. Significance testing results of the path structural models; (A) Iran; (B) Türkiye.

Table 9. The result of the hypothesized path model 2

Country	Path	Estimate	S.E.	S. R. W	C.R.	P
Iran	NQ → M	.0092	.007	.132	1.289	.197
	NQ → PP	-.0093	.005	-.162	-1.587	.112
	NQ → TW	1.3797	1.375	.104	1.0032	.315
	M → TW	-.6049	19.480	-.003	-.0311	.975
	PP → TW	40.058	23.835	.174	1.680	.0928
	NQ → M	-.016	.007	-.237	-2.146	.0319
Türkiye	NQ → PP	-.006	.006	-.114	-1.012	.311
	NQ → TW	4.752	1.283	.351	3.701	.000
	M → TW	-.0258	18.326	-.0001	-.001	.998
	PP → TW	132.839	23.677	.518	5.610	.000

Note. S.E. = Standardized effect, S.R. W= Standardized Regression Weights, C.R.=

Composite reliability

The bootstrap technique examined the mediation effect of motivation and preference in the relationship between neighborhood qualities and transport walking. Five thousand bootstrap samples with 95% percentile-confidence intervals were required to

run the bootstrap analysis (See Table 10). The results of the bootstrapping method suggested that there is no significant effect in terms of the mediating role of motivation and preference.

Table 10. The results of estimating the indirect effect of neighborhood qualities on transport walking through motivation and preference.

Country	Indirect Path	P. E. S. I. E	S.E.	Bootstrap		
				*BC Percentile 95% CI		Two-Tailed Significance (BC)
				Lower	Upper	
Iran	NQ → M and PP → TW	-.0286	.0334	-.01095	.0282	.2886
Türkiye	NQ → M and PP → TW	-.0593	.0639	-.1990	.0559	.3546

Note. S.E. = Standardized effect, P.E.S.I.E= Point Estimate Standardized Indirect Effects.

The moderation effects of the variable, gender, in the relationship between neighborhood qualities with motivation and preference, were examined. The results suggested that gender did not affect the relationship of neighborhood qualities with preference or motivation (See Figure 40 and Table 11).

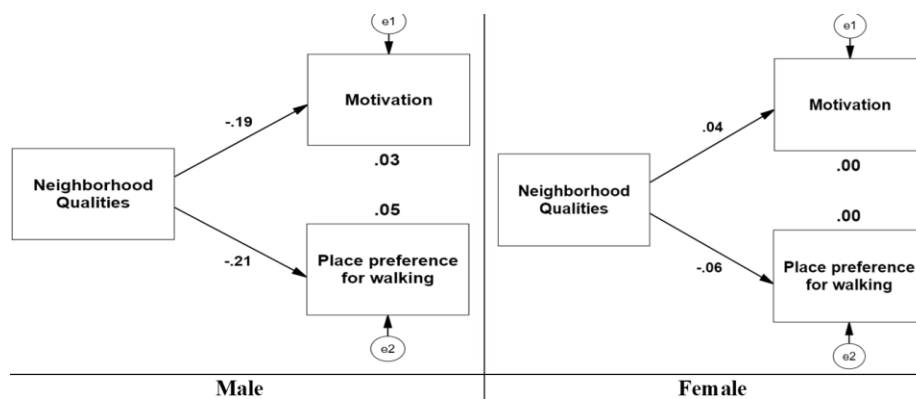


Figure 40. Gender moderate structural model.

Table 11. The result of gender moderation.

Country	Path	Estimate	S.E.	S. R. W	C.R.	P
Male	NQ → M	-.0115	.007	-.185	-1.610	.107
	NQ → PP	-.0120	.006	-.214	-1.873	.061
Female	NQ → M	.003	.007	.043	.427	.669
	NQ → PP	-.003	.005	-.062	-.613	.539

Note. S.E. = Standardized effect, S.R. W= Standardized Regression Weights, C.R.=

Composite reliability

The moderator role of neighborhood type was also investigated concerning neighborhood qualities with motivation. According to the findings (See Figure 41 and Table 12), neighborhood type had no effect. H3 could not be supported as a result.

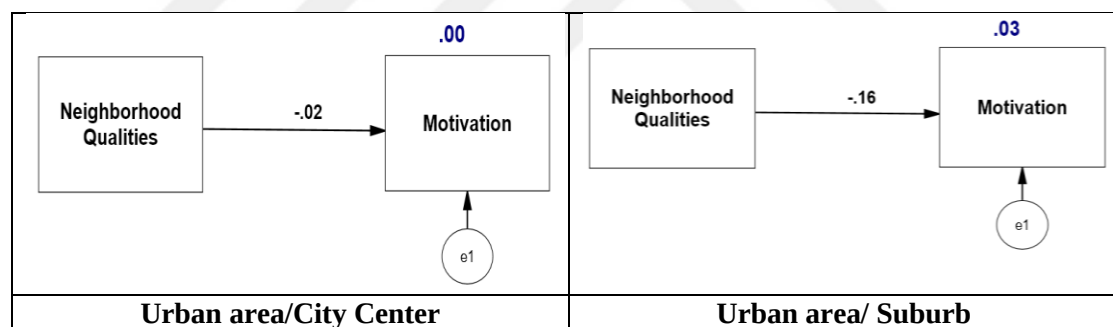


Figure 41. The result of neighborhood type moderation.

Table 12. The result of the neighborhood type moderation

Neighborhood Type	Path	Estimate	S.E.	S.R.W	C.R.	P
City center	NQ → M	-.0011	.0064	-.0163	-0.179	.857
Suburb	NQ → M	-.0119	.0105	-.160	-1.134	.256

Note. S.E. = Standardized effect, S.R. W= Standardized Regression Weights, C.R.= Composite reliability

4.2 Photovoice Analysis

4.2.1. Descriptive Analysis

Participants' socio-demographics, health, and walking frequency are summarized in Table 35. The majority were female, 62.5% in Iran and 60% in Türkiye. In Iran, most participants lived in apartments or villas, while all the Turkish participants lived in apartments. Additionally, in Iran, most participants self-reported having a 'good' health status, with 50% walking daily without aid. In Türkiye, however, individuals reported 'fair' or 'good' health status, with varying walking frequencies and no assistance (See Table 13).

Table 13. Descriptive characteristics of photovoice participants from both countries.

Demographics of participants.	Total= 12	
Working Status	Iran (8)	Türkiye (5)
Working full-time	0	1
Working part-time	0	0
Retired	5	1
Homemaker	3	3
Housing Type		
Separate or stand-alone- family home(villa)	3	0
Multi-family	2	0
Townhouses	0	0
Apartment	3	5
Residential Length		

Table 15. (continued).

<10 years	0	1
10–19 years	3	2
20–29 years	4	1
30 years and above	1	1
Self-assessed Health		
Very good	1	1
Good	4	2
Fair	3	2
Bad	0	0
Walking Frequency in the Neighbourhood		
Every day	4	2
A few times a week	2	1
Once a week	1	1
Several times a month	1	1
Walking Aid		
Walking stick	2	1
Table 15. (continued).		
Walking frame	0	0
Wheelchair	0	0
Motorized wheelchair	0	0
Nothing, no need	6	4

Participants took 107 photos in Iran and 50 in Türkiye related to the study. Based on these photographs and their discussions, 14 codes were identified in Iran. These codes

were then grouped into eight broader themes, as shown in Table 14. Five of the themes were identified as motivators for walking for transportation: Facilities, individual factors, neighborhood factors, weather/climatic factors, and cultural factors. Three main themes were identified as barriers to physical activity: Neighborhood barriers, weather/climatic barriers, and cultural barriers. These themes and their corresponding codes are described in Table 15.

Table 14. Motivators of Iranian older adults.

Themes	Codes
T1. Facilities	C1. Local Destinations
T2. Individual Factors	C2. Physical Health
	C3. Psychological Health
	C4. Sidewalks
T3. Neighborhood Factors	C5. Surroundings
T4. Climatical Factors	C6. Weather Conditions
T5. Cultural Factors	C7. National Ceremonies

Table 15. Barriers of Iranian older adults.

Themes	Codes
T6. Neighborhood Barriers	C8. Safety
	C9. Street Barriers
	C10. Pollution
T7. Climatical Barriers	C11. Weather Barriers
	C12. Believes and Habits
T8. Cultural Factors	C13. Regulations
	C14. Religious Event

In Türkiye, four main themes were identified as motivators for walking for transportation: T1. Facilities, T2. Individual factors, T3. Neighborhood factors, and T4. Climatic factors. Additionally, three main themes were considered barriers to transport walking: Neighborhood, weather/climatic, and cultural barriers. The details of these themes and their associated codes can be found in Tables 16 and 17.

Table 16. Motivators of Turkish older adults.

Themes	Codes
T1. Facilities	C1. Local Destinations
	C2. Physical Health
T2. Individual Factors	C3. Psychological Health
	C4. Sidewalks
T3. Neighborhood Factors	C5. Surroundings
T4. Climatical Factors	C6. Weather Conditions

Table 17. Barriers of Turkish older adults.

Themes	codes
	C7. Safety
T5. Neighborhood Barriers	C8. Street Barriers
T6. Climatical Barriers	C9. Pollution
T7. Individual Barriers	C10. Lifestyle

First, the common themes and codes are presented, and then the specific themes and codes for each area.

4.2.2. Common Motivators Highlighted in Both Countries

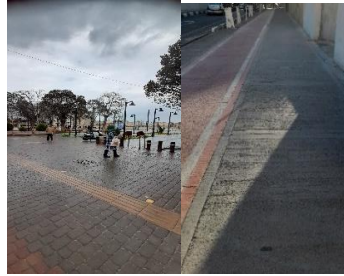
The participants in both countries identified four common themes. The first common theme is facilities. Older adults in Iran and Türkiye reported visiting the same places to reach and carry out their daily routines when walking for transport. These places were coded as "Local destinations" and included supermarkets/local groceries, banks, areas for walking and cycling, parks, pharmacies, and bakeries. In Iran, older adults also mentioned mosques as a destination. For instance, a seventy years old male reported "I walk to our local mosque two times a day.", and in Türkiye, transport stations such as bus stops were mentioned. Table 18 consists of relevant photos and corresponding quotes from the participants regarding these local destinations where they go to carry out their daily routines.

Table 18. Common local destinations.

Facility	Iran	Türkiye
Supermarket /Groceries	 "I go to the supermarket to buy fruits and vegetables." (Female, 75, Iran)	 "I walk to A101 to buy my daily needs." (Female, 60, Türkiye)
Bank	 "I went to the bank to pay my bill and take some cash." (Male, 65, Iran)	 "I came to the bank to take cash for shopping." (Female, 60, Türkiye)

Table 18. (continued).

walking and
cycling
places



"There is a newly constructed place for walking of Sabze-Meydan (Zanjan, Iran) that I go for a walk every day" (Female, 75, Iran)



"There is a walking path in our site and among the trees." (Male, 60, Türkiye)

Park



"I take my grandchildren to the park on weekends and meet my friends" (Female, 65, Iran)



"My grandchildren and I go to the park" (Female, 73, Türkiye)

Pharmacy



"It is enjoyable that the pharmacy is near to my home because I prefer to buy my drugs as soon as possible when they finish" (Female, 75, Iran)



"I go to the pharmacy every week to buy my drugs" (Female, 60, Türkiye)

The second theme is individual factors, which can be further divided into two codes: "physical health" and "psychological health." Under the category of physical health factors, Iranian participants mentioned reasons such as losing weight, the need to engage in physical activity for their health, and walking to alleviate pain. For instance, a male participant in his sixties from Iran shared, "After undergoing a heart operation, I need to walk every day or every two days." On the other hand, Turkish participants mentioned walking for physical activity. A Turkish man expressed, "I simply want to move a little by walking."

Regarding psychological health, participants from both countries highlighted that socializing with friends or other people motivated them to walk. An Iranian woman stated, "I enjoy walking outside to socialize because it makes me feel like I am a part of society."

The third common theme is neighborhood factors, which can be further categorized into three main codes: "Neighborhood sidewalks," "Neighborhood surroundings," and "Neighborhood location." According to the participants' feedback, Iranians emphasized the importance of ramps and fencing on sidewalks, as these features made walking more accessible for individuals, particularly those using walking frames. Additionally, the presence of seating areas and well-maintained sidewalks were identified as crucial factors by participants from both countries (See Table 19).

Table 19. Sidewalk motivators.

Iran	Türkiye
 "When there is a ramp to access somewhere I go, I can easily walk in with my walking frame and even without it when there is fencing around it" (Female, 67, Iran)	 "When there is a ramp to access somewhere I go, I can easily walk in with my walking frame and even without it when there is fencing around it" (Male, 60, Türkiye)
 Seating areas with shading in my neighborhood allows me to rest in any weather condition." (Female, 75, Iran)	 "There are benches among sidewalks of my neighborhood, and I can take a rest whenever I feel tired." (Male, 70, Türkiye)
 "Clear well-paved sidewalks make me walk easily." (Female, 65, Iran)	 "Convenient sidewalks is one of the positive aspects of my neighborhood." (Female, 60, Türkiye)

Another main point that emerged from the photovoice sessions was the location of neighborhoods in both countries, which made it easy for participants to access various places on foot. A female participant from Türkiye and another from Iran stated: "The central location of our neighborhood makes it easy to walk everywhere we want."

Regarding surrounding factors, trees, and green spaces were mentioned by participants from both countries. In addition, Iranian participants highlighted the importance of architectural, historical, and cultural elements in their neighborhoods (See Table 20).

Table 20. Surrounding motivators.

Photos	Statements
	Flowers and green spaces give a fantastic feeling while walking.” (Female, 64, Iran; Male, 67, Türkiye)
	Some exciting elements include building elevations and famous poems’ sculptures.” (Male, 73, Iran)
	I have a special ticket for Golestan Palace, and I go for a walk every day and enjoy the historical buildings.” (Female, 64, Iran)

The fourth and final common motivator mentioned by participants in both countries is the climatic factor. Almost all participants from both Iran and Türkiye expressed a preference for walking on sunny days. They said that the warm weather and clear sky make it more enjoyable to engage in walking activities.

4.2.3. Specific Motivator Theme from Iran

The cultural factor emerged as a specific motivator mentioned by Iranians. The research found that Iranians celebrate Noruz, the Iranian New Year, which provides numerous reasons for older adults to walk (See Table 21).

Table 21. Cultural motivators.

Photos	Statements
	"There are Noruz ceremonies and elements that make a great atmosphere in my neighborhood that I enjoy seeing when I walk" (Female, 75, Iran)
	"I walk to my sister's house to visit my relatives in Noruz" (Female, 80, Iran)

4.2.4. Common Barriers Highlighted in Both Countries

The first barrier mentioned by all participants is neighborhood barriers, which can be further divided into two factors: "Safety" and "Streets." Under the Safety factor, participants from both countries identified various issues, such as the lack of pedestrian walkways, the absence of traffic lights and crosswalks, and high car

speeds. Additionally, each country had specific factors mentioned by their participants. For instance, in Iran, a woman expressed concerns about the dangers and lack of safety while walking at night due to the presence of individuals struggling with addiction. In Türkiye, participants highlighted barriers such as the lack of stair fencing and the height of sidewalks (See Table 22).

Table 22. Safety barriers.

Iran	Türkiye
	
" I have to walk in vehicles way since there is not pedestrian place and I am scared to be heated by car." (Female, 80, Iran)	" In some parts of my neighborhood, there are no sidewalks and traffic lights." (Female, 80, Türkiye)

As mentioned before, Streets is another considered code. Hilly streets, low width of sidewalks, parked cars, barriers, and lack of well-maintained sidewalks were considered barriers in both countries. In addition, the lack of street lights, broad dirt stripes, and blind sidewalks was discussed by Iranian participants, and the lack of fencing for ramps and the unsuitable height of the sidewalks were reported by Turkish participants. Table 23 shows the related comments and photos.

Table 23. Street barriers.

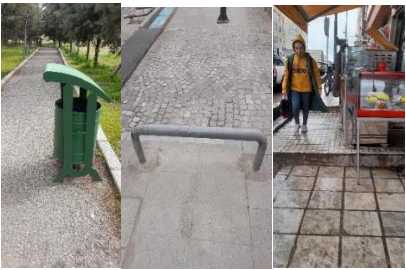
Iran	Türkiye
 “There are many canyons/hillsides in my neighborhood that limit the number of routes for getting from place to place” (Female, 63, Iran)	 "My neighborhood is so hilly, and it limits me." (Male, 73, Türkiye)
 "There are not enough car parks in my neighborhood, and people park them in the pedestrian ways which limits me since I use walking sticks." (Female, 80, Iran)	 "There are not enough car parks in my neighborhood, and people park them in the pedestrian ways which limits me since I use walking sticks." (Male, 60, Türkiye)
 “My walkway has some barriers including garbage cans, car barriers, and supermarket kiosks.” (Male, 60, Iran)	 “The trees in the middle of the sidewalks made it difficult to walk.” (Male, 73, Türkiye)

Table 23. (continued)

	
"The blind part of the sidewalk, because of its roughness and height, limits the walking and makes me walk separately with my friend on two sides of it and hit people who come from the front side." (Female, 75, Iran)	"There are cracks in the paving which makes me not choose that way for a walk." (Female, 80, Iran; Female, 73, Türkiye)
	
"Low width of sidewalks is annoying" (Male, 63, Iran)	"There are Low width sidewalks in my neighborhood." (Female, 60, Türkiye)

The second common barrier identified is climatic barriers, where participants from both countries mentioned weather-related obstacles. Snowy and rainy weather were highlighted as challenges by participants in Iran and Türkiye. On the other hand, a male participant from Shiraz City in Iran mentioned the preference to go out at night due to the warm weather during sunny days.

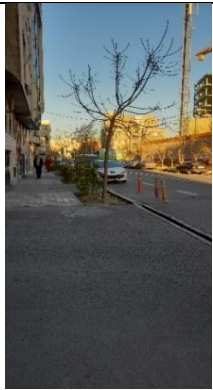
Additionally, participants from Iran specifically mentioned pollution as a barrier. Air pollution in cities like Tehran and dust pollution in cities like Zanzan and Tabriz were reported. For example, a male participant from Tehran shared that sometimes individuals above 60 years old are prohibited from going out due to air pollution

concerns. Furthermore, a female participant highlighted the harmful effects of dust pollution, stating that it reduces visibility and poses risks to walking.

4.2.5. Specific Barrier Theme from Iran and Türkiye

The cultural barrier's theme in Iran was specified by three codes: beliefs and habits, regulations, and religious events. Under the beliefs and habits code, two specific beliefs were reported by women. The first belief pertained to not walking after dark, possibly due to shyness and fear regarding encounters with males. A female participant from Iran expressed this sentiment: "I have a sense of shyness and kind of fear about males, so when I come across this situation when walking, I prefer to walk from the corner." The second belief is related to a habit of refraining from any walking for transport activity during specific hours due to perceived closure and silence. For instance, participants mentioned that in Tehran, there are few accessible destinations to walk to before 10 a.m., in Zanzan; it becomes limited after 8 or 9 p.m. (See Table 24).

Table 24. Cultural barriers.

Photo	Statements
	" It is our cities habit that close bazaar and go back home at 8p.m, and in the mornings except for bakeries and some office hour places like banks others open at 10p.m, so after that time there are no walking movements done" (Male, 63, Iran)

In Türkiye, individual barriers were specifically identified explicitly through the lifestyle code. Participants mentioned lack of time, laziness, and tiredness as reasons for not engaging in walking. For example, a sixty years old male participant from Türkiye stated, "Not having time and feeling lazy and tired after work, not having enough of such a habit."

CHAPTER 5

DISCUSSION

5.1. Mediators and Moderators of Older Adults' Transport Walking

This thesis investigated whether motivation and preference act as mediators and demographic factors and gender and neighborhood type act as moderators in the association between neighborhood qualities and transport walking among Iranian and Turkish older adults. Since the cultural difference was significant, the study examined the two countries separately. The first research question explored differences in mediating levels between the two countries (**RQ1:** Do preference have different mediating levels of transport walking in Iran and Türkiye? and **RQ2:** Does motivation has a different mediating level of transport walking in Iran and Türkiye?). The results indicated no significant difference in mediating levels between the two countries. However, when examining the direct effects, neighborhood qualities and preferences were found to impact Türkiye positively.

Interestingly, the findings of this thesis did not align with previous research that suggested a mediator role for motivation (Zuniga-Teran et al., 2017) and preference (Cao et al., 2019). This discrepancy may be attributed to the omission of attitudes as a factor in the study, as Hatamzadeh et al. (2020a) suggested. The hypothesis proposed that Iran and Türkiye would mediate the relationship between neighborhood qualities

and transport walking based on motivation and preference (**H1:** Iran and Türkiye differ in mediating the relationship between neighborhood qualities and transport walking with motivation and preference). However, the study's findings contradicted this hypothesis.

Gender was examined as a potential moderator in the relationship between neighborhood qualities with motivation and preference in transport walking (**RQ3:** To what extent do socio-demographic factors moderate the relationship between preference and neighborhood qualities? and **RQ4:** To what extent is the relationship between motivation and neighborhood qualities moderated by socio-demographic factors?). Previous studies have identified associations between gender and walking behavior, suggesting that gender may influence the impact of neighborhood qualities on motivation and preference. However, the findings of this thesis did not support these hypotheses, as no significant relationship was found between gender and transport walking. Consequently, both hypotheses (**H2:** Gender moderates the impact of neighborhood qualities on motivation) and (**H4:** Gender moderates the effect of neighborhood qualities on preference) were rejected. However, there was a significant difference among Turkish males and females regarding walking duration. This could be because it should be considered with other demographic factors such as attitudes, education level, and work status (Scheiner, 2014; Hatamzadeh et al., 2020a).

In addition to gender, the thesis also examined neighborhood type as a potential moderator in the relationship between neighborhood qualities and motivation (**H3:** The neighborhood type moderates neighborhood qualities' impact on motivation). Previous studies have suggested that neighborhood type may moderate the effects of neighborhood qualities on motivation. However, the findings of this study did not

support this hypothesis. There was no significant moderator effect of neighborhood type on transport walking.

The discrepancy between the results of this study and previous research may be attributed to various factors. One possible explanation is the influence of attitudes, as suggested by Frank et al. (2010). Attitudes towards the neighborhood and walking may shape individuals' motivation, regardless of the specific neighborhood type.

Three research questions investigated moderated effects of motivation on neighborhood quality and transport walking (**RQ5**: To what extent is the relationship between neighborhood qualities and transport walking moderated by motivation?, **RQ6**: Is walking duration correlated with motivation for older adults?, and **RQ7**: Is there a correlation between walking frequency and older adults' motivation?). The hypothesis in the thesis proposed a relationship between transport walking and motivation (**H5**: There is a significant correlation between walking duration and frequency with older adults' motivation). However, the study's results did not support this hypothesis, as no significant relationship was found between walking duration and frequency and older adults' motivation which is not aligned with previous research (Hatamzadeh et al., 2020b). Therefore, **H5** was rejected. The reason could be not considering the education level and work status as rudimentary proxies for income (Scheiner, 2014).

Moreover, in Türkiye, neighborhood qualities had a positive direct effect on transport walking, and there was a moderate positive correlation between place preference and transport walking. Among neighborhood qualities, walking and cycling places, street and safety, surroundings, and facility access were necessary. Also, there was a negative correlation between age and walking duration. So, as their age increases,

older adults walk for a short period. Researchers could not reach a joint decision on this issue; there has revealed a favorable relationship between age and walking (Hatamzadeh et al., 2020b), while others found the opposite (Rodríguez & Joo, 2004). So, this thesis's findings align with the literature suggesting an opposite correlation between mentioned variables. On the other hand, hilly streets correlate negatively with walking; it means that older adults walk less when the street is hilly. In Iran, surroundings, streets, walking and cycling places, access to facilities, and safety were important, respectively. In addition, results indicate that income level has a positive relationship with walking duration, meaning that by raising income, older adults walk longer. This finding does not align with previous studies in Iran and USA (Hatamzadeh et al., 2020b; Yang & Diez Roux, 2012).

5.2. Transport Walking Motivators and Barriers

The inclusion of the current phase in the study was necessitated by the findings of the previous phase, which explored motivation and preferences. In the earlier phase, it was observed that there was no mediating role of preference and motivation in the overall findings. In light of the existing literature, it was crucial to consider attitudes as an additional factor in understanding older adults' walkability (Hatamzadeh et al., 2020a). In the second phase of the study, the photovoice method was employed to facilitate discussions among older adults from both countries regarding their neighborhood environments and the factors that either motivate or restrict walking as a means of transportation. These factors were categorized into two main themes:

motivators and barriers. The findings of this thesis revealed several common and specific sub-themes.

One of the identified categories of neighborhoods was related to various characteristics such as sidewalks, safety measures, green spaces, architecture, and historical elements. These elements have previously been recognized as crucial environmental factors for promoting walking (Gullón et al., 2019; Jackson, 2020). Sidewalks were identified as an emerging factor for Iranian and Turkish older adults. Paving condition, height and width, furniture, fencing, safety, and lighting were the aspects discussed by participants. Participants mentioned that this result could be because they have some difficulty walking due to their age and physical conditions compared to younger adults, so they prefer well-maintained, clean, bright sidewalks. Their suggestions for not well-maintained sidewalks include: Creating pedestrian streets for walking, widening sidewalks for people with reduced mobility, increasing seating furniture, street and traffic lights, pedestrian lane width, surface improvements (e.g., sidewalk maintenance), increasing police officers, and specifying fine for parked cars in pedestrian walks instead of making barriers.

The second common theme identified about older adults' motivation and barriers to walking was climatic conditions. Weather factors such as snow and rain were perceived as barriers, while sunny weather had to motivate and hinder effects. The rationale behind these findings lies in the variations in climate and thermal comfort, as indicated by previous studies (Baobeid et al., 2021). Cities with cold and mountainous climates typically experience cold weather, making sunny days more suitable for walking, particularly during winter when thermal comfort is higher. Conversely, hot and dry climates pose challenges for walking due to the high temperatures (Baobeid et al., 2021). To address these climatic considerations, participants suggested increasing

the availability of shaded areas within neighborhoods and utilizing suitable materials for pavement surfaces. These measures can enhance the comfort of walking under different weather conditions. Another significant factor mentioned by Iranian participants was air quality, specifically air pollution and dust pollution, which aligns with previous research findings (Kim & Michael Hall, 2023). Air pollution in the study area is attributed to industrial emissions and the increasing use of personal vehicles (Azmi & Karim, 2012). On the other hand, dust pollution arises from water sources drying up and the consequent rise of dust particles (Ebrahimi-Khusfi et al., 2021). Recommendations to mitigate these issues include effective management of water resources and raising awareness about air and dust pollution control measures.

The third common theme identified in the study is related to facilities and local destinations. This thesis's findings supported a recent study conducted in Germany that highlighted the significant link between the accessibility of various commercial service providers, restaurants, healthcare facilities, and recreational locations and increased walking for transportation purposes (Hasselder et al., 2022). Conversely, this thesis did not support the findings of Inoue et al. (2011). A study conducted in Japan found that access to stores had a significantly more favorable impact on women's walking than men.

Physical and psychological health emerged as one of the most significant motivating factors for older adults to engage in walking. The discussions conducted in this study revealed that walking positively lowers the risk of heart disease and increases overall mortality rates, which is consistent with literature from studies conducted in South Korea (Kim & Jin, 2023). In addition to the physical health benefits, the study also found that walking plays a role in improving mental well-being. Older individuals who do not participate in social events or engage in broader community interactions

may experience low morale, sadness, and loneliness. These consequences were mentioned in the discussions and indicated the impact of lifestyle choices on mental health. While previous studies have highlighted the importance of a healthy lifestyle, including physical activity, in promoting overall well-being among older adults (Chen et al., 2022; Hakman et al., 2019), this thesis provides additional evidence that employed older adults may struggle to maintain a healthy lifestyle, leading to a more sedentary lifestyle. This lack of engagement in physical activity may contribute to a sense of laziness or reduced motivation among older individuals.

The last theme from the discussions with Iranian participants was cultural factors. Cultural environment, cultural activities, and cultural beliefs were explored in this study, aligning with previous research conducted predominantly in Eastern countries (Hatamzadeh & Hosseinzadeh, 2020; Laatikainen et al., 2018; Lak et al., 2020). This study specified certain cultural barriers that impact walking among older adults. Specific opening or closing hours in certain cities, feelings of shyness and lack of trust among women across men, and religious ceremonies such as Ramadan, during which older adults may lack the energy for walking, were identified as barriers. On the other hand, national ceremonies like Noruz in Iran were identified as motivators for walking, as visiting relatives is necessary. In neighborhoods and streets, cultural activities by the government create a unique atmosphere. These findings support previous literature highlighting the role of cultural activities in encouraging individuals, especially older adults, to walk (Hakman et al., 2019). While the specific cultural beliefs and habits not mentioned in this thesis are not discussed, it is essential to recognize that cultural factors can significantly shape individuals' behaviors and preferences, including their attitudes toward physical activity and walking.

Table 27. Hypotheses of the thesis.

Hypotheses	Findings	Decision	Consistent	Inconsistent
H1: Iran and Türkiye differ in mediating the relationship between neighborhood qualities and transport walking with motivation and preference.	Although there was no significant mediating relationship the second phase results showed some differences. However, due to the sample size it could not be generalized.	rejected		Zuniga-Teran et al., 2017; Cao et al., 2019
H2: Gender moderates the impact of neighborhood qualities on motivation.	No significant relationship was found between gender and transport walking.	rejected	Scheiner, 2014	Hatamzadeh et al., 2020a
H3: The neighborhood type moderates neighborhood qualities' impact on motivation.	No significant moderator effect of neighborhood type on transport walking.	rejected	Frank et al. (2010)	Hatamzadeh et al., 2020a

Table 27. (continued)

H4: Gender moderates the impact of neighborhood qualities on preference.	No significant relationship was found between gender and transport walking.	rejected		
H5: There is a significant correlation between walking duration and frequency with older adults' motivation	No significant relationship was found between walking duration and frequency and older adults' motivation	rejected	Scheiner, 2014	Hatamzadeh et al., 2020b

CHAPTER 6

CONCLUSION

This thesis explored the interplay between neighborhood qualities, motivations, preferences, and demographic factors with transport walking behavior. The study contributes valuable insights into this complex relationship by investigating how preferences and motivations influence the relationship between neighborhood qualities and transport walking in older adults.

Previous studies showed that planners and policymakers must address the following issues to make cities more pedestrian-friendly: streets built exclusively to meet the needs of drivers; excessive travel distances caused by urban sprawl; and a lack of understanding of the needs of pedestrians, how they perceive the built environment, and how it affects their mode of transportation (Distefano et al., 2023). Older people have identified many critical elements of the neighborhood walking context, including safety features that guard against falls and traffic hazards, convenient access to destinations, well-maintained pedestrian infrastructure, neighborhood attractiveness, and public transportation (Distefano et al., 2021). When thinking about pedestrian paths, it is critical to distinguish between a route's length and intricacy. The level of service provided by the roadway and traffic environment, as well as the overall attractiveness of the environment, are some of the specific factors that may influence pedestrians' choice of route. These factors include distance or time, the number of obstacles or interactions with other pedestrians along the route, the directness of the

route (i.e., the number of directional changes), and the level of service provided by the roadway and traffic environment (Distefano et al., 2021). However, the literature examination reveals that while numerous trip measures have been employed to identify walking behavior, most research only used one measure for their analysis. The analysis shows that among the numerous explanatory elements, environmental factors have received the most attention, while the influence of subjective factors on walking behavior is relatively small, especially in developing nations (Heroy et al., 2022; Wang & Chen, 2023a; Zhang et al., 2019).

Additionally, there are not enough studies examining factors' indirect effects, and most studies have mainly focused on their direct effects. This study fills in gaps in the existing literature by evaluating the direct and indirect impact of several variables, including subjective and environmental factors, on walking behavior. There are many different individual, cultural, and physical-environmental elements at work. It is possible to confirm that walkability is a particular problem of the researched area and that various local factors influence it in line with earlier studies (Distefano et al., 2023). Neighborhoods in metropolitan cities of both countries with physical development and high population growth rate were chosen as sites.

The results showed no significant relationship between neighborhood qualities with motivation and preference. Thus, the two countries had no mediating levels of motivation and preference. This might be due to needing to consider attitudes in the first phase. However, the second phase showed that motivations and preferences could indirectly affect transport walking. In addition, the indirect effect of neighborhood qualities and transport walking was not modified by gender and neighborhood type. This may be because it should be considered together with other demographic factors. On the other hand, data analysis showed that as their age

increases, older adults walk for a short period and walk less when the street is hilly in Türkiye. Additionally, neighborhood qualities had a favorable direct impact on transport walking, and place preference and transport walking had a moderately positive relationship. Walking and cycling routes were important neighborhood quality in Türkiye, while surroundings were mostly preferred neighborhood quality in Iran. In Iran, by raising income, older adults walk longer.

Through photovoice, participants from two developing countries of Iran and Türkiye could debate and think about the aspects of the neighborhood environment that either encouraged or discouraged them and their friends from engaging in transport walking. Participants recognized categories through their images and group conversations, such as the facilities, physical and psychological health, sidewalks, surroundings, location, and neighborhood safety. In addition, participants came up with suggestions for policy-makers to improve their physical activity environment concerning the physical environment, the sociocultural environment, and the political and economic environment. This interactive procedure suggests a shift in how scholars, citizens, and policymakers view one another.

Understanding these mechanisms better may help decision-makers, researchers, and interventionists decide which pathways should be the focus of interventions to enhance cognitive performance in older persons. Modifying neighborhood infrastructure is necessary but insufficient to improve the older adults' transport walking.

This study acknowledges several limitations that should be addressed in future research to enhance the analysis and broaden the understanding of the topic. These

limitations include the limited sample size and scope of the study and the duration of data collection.

The study relied on data collected from fifty-two neighborhoods in nine cities in Türkiye and eight cities in Iran using snowball sampling. While this approach allowed for gathering data from various neighborhoods, the lack of perception about selected neighborhoods may restrict the generalizability of the findings. Future studies could aim to include perceptual studies in neighborhoods. This would provide a more comprehensive understanding of the relationship between neighborhood qualities, motivations, and transport walking across different contexts.

Another limitation is related to the sample size, which was influenced by factors such as limited internet access in some regions of Iran and the requirement for direct contact with older adults in both countries. Also, in the second phase, sample size were few and it limits the generalizability. Future studies could consider larger sample sizes and explore different age groupings, such as "young old," "older old," and "oldest old." It may also be beneficial to conduct separate analyses for each age group, considering gender differences. Additionally, future research could examine the walking behaviors of other user groups, such as children and young people, to better understand walking preferences and motivations across different age cohorts.

The duration of data collection was also a constraint in this study, as the survey was conducted within a specific month, resulting in different weather conditions throughout that period. Future studies could aim to collect data over an extended period, considering multiple seasons and similar weather conditions at specific times of the day. This would provide a more nuanced understanding of how weather conditions may influence transport walking behavior among older adult

REFERENCES

- Agampatian, R. (2014). *Using GIS to measure walkability: A Case study in New York City*.
- Amato, J. (2004). *On foot: A history of walking*. NYU Press.
- Asiamah, N., Bateman, A., Hjorth, P., Khan, H. T. A., & Danquah, E. (2023). Socially active neighborhoods: construct operationalization for aging in place, health promotion and psychometric testing. In *Health promotion international* (Vol. 38, Issue 1). NLM (Medline). <https://doi.org/10.1093/heapro/daac191>
- Azmi, D. I., & Karim, H. A. (2012). Implications of Walkability Towards Promoting Sustainable Urban Neighbourhood. *Procedia - Social and Behavioral Sciences*, 50, 204–213. <https://doi.org/10.1016/j.sbspro.2012.08.028>
- Bagley, M. N., & Mokhtarian, P. L. (2002). The impact of residential neighborhood type on travel behavior: A structural equations modeling approach. *The Annals of Regional Science*, 36(2), 279–297. <https://doi.org/10.1007/s001680200083>
- Baobeid, A., Koç, M., & Al-Ghamdi, S. G. (2021). Walkability and Its Relationships With Health, Sustainability, and Livability: Elements of Physical Environment and Evaluation Frameworks. In *Frontiers in Built Environment* (Vol. 7). Frontiers Media S.A. <https://doi.org/10.3389/fbuil.2021.721218>
- Behnamifard, F., Shafieiyoun, Z., & Behzadfar, M. (2023). Associations of Perceived and Objective Neighborhood Environment Attributes with Walking in Older Adults: A Cross-Sectional Study. *Journal of Urban Planning and Development*, 149(2). <https://doi.org/10.1061/jupddm.upeng-4269>
- Braun, V., & Clarke, V. (2012). *Thematic analysis*. American Psychological Association.
- Cao, X., Mokhtarian, P. L., & Handy, S. L. (2007). Do changes in neighborhood characteristics lead to changes in travel behavior? A structural equations modeling approach. *Transportation*, 34(5), 535–556. <https://doi.org/10.1007/s11116-007-9132-x>
- Cao, Y., Heng, C. K., & Fung, J. C. (2019). Using walk-along interviews to identify environmental factors influencing older adults' out-of-home behaviors in a high-rise, high-density neighborhood. *International Journal of Environmental Research and Public Health*, 16(21). <https://doi.org/10.3390/ijerph1621425>

- Cérin, C., Andres, F., & Geldwerth-Feniger, D. (2021, June 20). Towards an emulation tool based on ontologies and data life cycles for studying smart buildings. *Proceedings of the International Workshop on Big Data in Emergent Distributed Environments, BiDEDE 2021 - In Conjunction with the 2021 ACM SIGMOD/PODS Conference*. <https://doi.org/10.1145/3460866.3461772>
- Cervero, R., & Kockelman, K. (1997). Travel demand and the 3Ds: Density, diversity, and design. *Transportation Research Part D: Transport and Environment*, 2(3), 199–219. [https://doi.org/10.1016/S1361-9209\(97\)00009-6](https://doi.org/10.1016/S1361-9209(97)00009-6)
- Cervero, R., Sarmiento, O. L., Jacoby, E., Gomez, L. F., & Neiman, A. (2009). Influences of Built Environments on Walking and Cycling: Lessons from Bogotá. *International Journal of Sustainable Transportation*, 3(4), 203–226. <https://doi.org/10.1080/15568310802178314>
- Chen, L., Arai, H., Assantachai, P., Akishita, M., Chew, S. T. H., Dumlao, L. C., Duque, G., & Woo, J. (2022). Roles of nutrition in muscle health of community-dwelling older adults: evidence-based expert consensus from Asian Working Group for Sarcopenia. *Journal of Cachexia, Sarcopenia and Muscle*, 13(3), 1653–1672. <https://doi.org/10.1002/jcsm.12981>
- Comstock, N., Miriam Dickinson, L., Marshall, J. A., Soobader, M.-J., Turbin, M. S., Buchenau, M., & Litt, J. S. (2010). Neighborhood attachment and its correlates: Exploring neighborhood conditions, collective efficacy, and gardening. *Journal of Environmental Psychology*, 30(4), 435–442. <https://doi.org/10.1016/j.jenvp.2010.05.001>
- Coogan, M. A., Adler, T., & Karash, K. H. (2012). Applying latent factors in structural equation modeling. *Journal of Transport and Land Use*, 5(3), 68–82. <http://www.jstor.org/stable/26201702>
- Craig, C. L., Marshall, A. L., Sjöström, M., Bauman, A. E., Booth, M. L., Ainsworth, B. E., Pratt, M., Ekelund, U. L. F., Yngve, A., & Sallis, J. F. (2003). International physical activity questionnaire: 12-country reliability and validity. *Medicine & Science in Sports & Exercise*, 35(8), 1381–1395.
- Distefano, N., Leonardi, S., & Liotta, N. G. (2023). Walking for Sustainable Cities: Factors Affecting Users' Willingness to Walk. *Sustainability*, 15(7), 5684. <https://doi.org/10.3390/su15075684>
- Distefano, N., Pulvirenti, G., & Leonardi, S. (2021). Neighbourhood walkability: Elderly's priorities. *Research in Transportation Business and Management*, 40. <https://doi.org/10.1016/j.rtbm.2020.100547>
- Dovey, K., & Pafka, E. (2020). What is walkability? The urban DMA. *Urban Studies*, 57(1), 93–108. <https://doi.org/10.1177/0042098018819727>
- Ebrahimi-Khusfi, Z., Taghizadeh-Mehrjardi, R., Roustaei, F., Ebrahimi-Khusfi, M., Mosavi, A. H., Heung, B., Soleimani-Sardo, M., & Scholten, T. (2021). Determining the contribution of environmental factors in controlling dust

- pollution during cold and warm months of western Iran using different data mining algorithms and game theory. *Ecological Indicators*, 132, 108287. <https://doi.org/10.1016/j.ecolind.2021.108287>
- Encyclopædia Britannica. (2023, April 11). *Human evolution*. Britannica Academic.
- Ewing, R., Ewing, R., & Cervero, R. (2001). *WHY THIS SURVEY? Travel and the Built Environment A Synthesis*.
- Ewing, R., Hajrasouliha, A., Neckerman, K. M., Purciel-Hill, M., & Greene, W. (2016). Streetscape Features Related to Pedestrian Activity. *Journal of Planning Education and Research*, 36(1), 5–15. <https://doi.org/10.1177/0739456X15591585>
- Fangfang, H., Xiao, H., Shuai, Z., Qiong, W., Jingya, Z., Guodong, S., & Yan, Z. (2021). Living Environment, Built Environment and Cognitive Function among Older Chinese Adults: Results from a Cross-Sectional Study. *Journal of Prevention of Alzheimer's Disease*, 1–10. <https://doi.org/10.14283/jpad.2021.59>
- Frank, L. D., Sallis, J. F., Saelens, B. E., Leary, L., Cain, K., Conway, T. L., & Hess, P. M. (2010). The development of a walkability index: application to the Neighborhood Quality of Life Study. *British Journal of Sports Medicine*, 44(13), 924–933. <https://doi.org/10.1136/bjsm.2009.058701>
- Frank, L. D., Schmid, T. L., Sallis, J. F., Chapman, J., & Saelens, B. E. (2005). Linking objectively measured physical activity with objectively measured urban form. *American Journal of Preventive Medicine*, 28(2), 117–125. <https://doi.org/10.1016/j.amepre.2004.11.001>
- Gao, J., Kamphuis, C. B. M., Helbich, M., & Ettema, D. (2020). What is ‘neighborhood walkability’? How the built environment differently correlates with walking for different purposes and with walking on weekdays and weekends. *Journal of Transport Geography*, 88. <https://doi.org/10.1016/j.jtrangeo.2020.102860>
- Guest, G., MacQueen, K. M., & Namey, E. E. (2011). *Applied thematic analysis*. sage publications.
- Gullón, P., Díez, J., Conde, P., Ramos, C., Márquez, V., Badland, H., Escobar, F., & Franco, M. (2019). Using Photovoice to Examine Physical Activity in the Urban Context and Generate Policy Recommendations: The Heart Healthy Hoods Study. *International Journal of Environmental Research and Public Health*, 16(5), 749. <https://doi.org/10.3390/ijerph16050749>
- Gupta, K., Kumar, P., Pathan, S. K., & Sharma, K. P. (2012). Urban Neighborhood Green Index - A measure of green spaces in urban areas. *Landscape and Urban Planning*, 105(3), 325–335. <https://doi.org/10.1016/j.landurbplan.2012.01.003>
- Guzman, L. A., Arellana, J., Oviedo, D., & Moncada Aristizábal, C. A. (2021). COVID-19, activity and mobility patterns in Bogotá. Are we ready for a ‘15-minute city’? *Travel Behaviour and Society*, 24, 245–256. <https://doi.org/10.1016/j.tbs.2021.04.008>

- Hair, J. F., Anderson, R. E., Babin, B. J., & Black, W. C. (2010). *Multivariate data analysis: A global perspective (Vol. 7): Pearson Upper Saddle River*.
- Hakman, A., Andrieieva, O., Kashuba, V., Omelchenko, T., Ion, C., Danylchenko, V., & Levinskaia, K. (2019). Technology of planning and management of leisure activities for working elderly people with a low level of physical activity. *Journal of Physical Education and Sport*, 19, 2159–2166. <https://doi.org/10.7752/jpes.2019.s6324>
- Handy, S. L., Boarnet, M. G., Ewing, R., & Killingsworth, R. E. (2002). How the built environment affects physical activity. *American Journal of Preventive Medicine*, 23(2), 64–73. [https://doi.org/10.1016/S0749-3797\(02\)00475-0](https://doi.org/10.1016/S0749-3797(02)00475-0)
- Hasselder, P., Brüchert, T., Baumgart, S., & Bolte, G. (2022). Destinations fostering older adults' walking for transport: a cross-sectional study from Germany. *BMC Geriatrics*, 22(1). <https://doi.org/10.1186/s12877-022-02896-w>
- Hatamzadeh, Y., Habibian, M., & Khodaii, A. (2020a). Measuring walking behaviour in commuting to work: investigating the role of subjective, environmental and socioeconomic factors in a structural model. *International Journal of Urban Sciences*, 24(2), 173–188. <https://doi.org/10.1080/12265934.2019.1661273>
- Hatamzadeh, Y., Habibian, M., & Khodaii, A. (2020b). Walking mode choice across genders for purposes of work and shopping: A case study of an Iranian city. *International Journal of Sustainable Transportation*, 14(5), 389–402. <https://doi.org/10.1080/15568318.2019.1570404>
- Hatamzadeh, Y., & Hosseinzadeh, A. (2020a). Toward a deeper understanding of elderly walking for transport: An analysis across genders in a case study of Iran. *Journal of Transport and Health*, 19. <https://doi.org/10.1016/j.jth.2020.100949>
- Hearst, M. O., Sirard, J. R., Forsyth, A., Parker, E. D., Klein, E. G., Green, C. G., & Lytle, L. A. (2013). The relationship of area-level sociodemographic characteristics, household composition and individual-level socioeconomic status on walking behavior among adults. *Transportation Research Part A: Policy and Practice*, 50, 149–157. <https://doi.org/10.1016/j.tra.2013.01.006>
- Heroy, S., Loaiza, I., Pentland, A., & O'Clery, N. (2022). Are neighbourhood amenities associated with more walking and less driving? Yes, but predominantly for the wealthy. *Environment and Planning B: Urban Analytics and City Science*. <https://doi.org/10.1177/23998083221141439>
- Ho, R. (2006). *Handbook of univariate and multivariate data analysis and interpretation with SPSS*. CRC press.
- Hu, G., Jousilahti, P., Borodulin, K., Barengo, N. C., Lakka, T. A., Nissinen, A., & Tuomilehto, J. (2007). Occupational, commuting and leisure-time physical activity in relation to coronary heart disease among middle-aged Finnish men and women. *Atherosclerosis*, 194(2), 490–497. <https://doi.org/10.1016/j.atherosclerosis.2006.08.051>

- Hu, G., Qiao, Q., Silventoinen, K., Eriksson, J. G., Jousilahti, P., Lindström, J., Valle, T. T., Nissinen, A., & Tuomilehto, J. (2003). Occupational, commuting, and leisure-time physical activity in relation to risk for Type 2 diabetes in middle-aged Finnish men and women. *Diabetologia*, 46(3), 322–329.
<https://doi.org/10.1007/s00125-003-1031-x>
- Inoue, S., Ohya, Y., Odagiri, Y., Takamiya, T., Kamada, M., Okada, S., Oka, K., Kitabatake, Y., Nakaya, T., & Sallis, J. F. (2011). Perceived neighborhood environment and walking for specific purposes among elderly Japanese. *Journal of Epidemiology*, 21(6), 481–490.
- Jackson, M. (2020). *The Role of Community Completeness in Older Adults Experiences of Health and Wellbeing: A Photovoice Study*.
- Kärrholm, M., Johansson, M., Lindelöw, D., & Ferreira, I. A. (2017). Interseriality and Different Sorts of Walking: Suggestions for a Relational Approach to Urban Walking. *Mobilities*, 12(1), 20–35.
<https://doi.org/10.1080/17450101.2014.969596>
- Keadle, S. K., McKinnon, R., Graubard, B. I., & Troiano, R. P. (2016). Prevalence and trends in physical activity among older adults in the United States: A comparison across three national surveys. *Preventive Medicine*, 89, 37–43.
<https://doi.org/10.1016/j.ypmed.2016.05.009>
- Kemperman, A., & Timmermans, H. (2014). Green spaces in the direct living environment and social contacts of the aging population. *Landscape and Urban Planning*, 129, 44–54. <https://doi.org/10.1016/j.landurbplan.2014.05.003>
- Kim, E. J., & Jin, S. (2023). Walk Score and Neighborhood Walkability: A Case Study of Daegu, South Korea. *International Journal of Environmental Research and Public Health*, 20(5). <https://doi.org/10.3390/ijerph20054246>
- Kim, M. J., & Michael Hall, C. (2023). Is tourist walkability and well-being different? *Current Issues in Tourism*, 26(2), 171–176.
<https://doi.org/10.1080/13683500.2021.2017409>
- Kim, S. J., Blesoff, J. R., Tussing-Humphrys, L., Fitzgibbon, M. L., & Peterson, C. E. (2023). The association between neighborhood conditions and weight loss among older adults living in a large urban city. *Journal of Behavioral Medicine*.
<https://doi.org/10.1007/s10865-023-00410-0>
- Kim, S., Park, S., & Lee, J. S. (2014). Meso- or micro-scale? Environmental factors influencing pedestrian satisfaction. *Transportation Research Part D: Transport and Environment*, 30, 10–20. <https://doi.org/10.1016/j.trd.2014.05.005>
- Kline, R. B. (2023). *Principles and practice of structural equation modeling*. Guilford publications.
- Koohsari, M. J., Sugiyama, T., Hanibuchi, T., Shibata, A., Ishii, K., Liao, Y., & Oka, K. (2018). Validity of Walk Score® as a measure of neighborhood walkability in Japan. *Preventive Medicine Reports*, 9, 114–117.
<https://doi.org/10.1016/j.pmedr.2018.01.001>

- Krueger, R. A., & Casey, M. A. (2002). *Designing and conducting focus group interviews* (Vol. 18). CiteSeer.
- Laatikainen, T., Haybatollahi, M., & Kytä, M. (2018). Environmental, Individual and Personal Goal Influences on Older Adults' Walking in the Helsinki Metropolitan Area. *International Journal of Environmental Research and Public Health*, 16(1), 58. <https://doi.org/10.3390/ijerph16010058>
- Lak, A., Aghamolaei, R., Baradaran, H. R., & Myint, P. K. (2020). A Framework for Elder-Friendly Public Open Spaces from the Iranian Older Adults' perspectives: A Mixed-Method Study. *Urban Forestry & Urban Greening*, 56, 126857. <https://doi.org/10.1016/j.ufug.2020.126857>
- Laverty, A. A., Palladino, R., Lee, J. T., & Millett, C. (2015). Associations between active travel and weight, blood pressure and diabetes in six middle income countries: a cross-sectional study in older adults. *International Journal of Behavioral Nutrition and Physical Activity*, 12(1), 65. <https://doi.org/10.1186/s12966-015-0223-3>
- Lee, S., & Talen, E. (2014). Measuring Walkability: A Note on Auditing Methods. *Journal of Urban Design*, 19(3), 368–388. <https://doi.org/10.1080/13574809.2014.890040>
- Leslie, E., Coffee, N., Frank, L., Owen, N., Bauman, A., & Hugo, G. (2007). Walkability of local communities: Using geographic information systems to objectively assess relevant environmental attributes. *Health & Place*, 13(1), 111–122. <https://doi.org/10.1016/j.healthplace.2005.11.001>
- Ling, T. Y., Lu, H. T., Kao, Y. P., Chien, S. C., Chen, H. C., & Lin, L. F. (2023). Understanding the Meaningful Places for Aging-in-Place: A Human-Centric Approach toward Inter-Domain Design Criteria Consideration in Taiwan. *International Journal of Environmental Research and Public Health*, 20(2). <https://doi.org/10.3390/ijerph20021373>
- Logan, T. M., Hobbs, M. H., Conrow, L. C., Reid, N. L., Young, R. A., & Anderson, M. J. (2022). The x-minute city: Measuring the 10, 15, 20-minute city and an evaluation of its use for sustainable urban design. *Cities*, 131. <https://doi.org/10.1016/j.cities.2022.103924>
- Lu, Y., Sarkar, C., & Xiao, Y. (2018). The effect of street-level greenery on walking behavior: Evidence from Hong Kong. *Social Science & Medicine*, 208, 41–49. <https://doi.org/10.1016/j.socscimed.2018.05.022>
- Luciano, A., Pascale, F., Polverino, F., & Pooley, A. (2020). Measuring Age-Friendly Housing: A Framework. *Sustainability*, 12(3), 848. <https://doi.org/10.3390/su12030848>
- Manzoli, J. A., Oliveira, A., & Neto, M. de C. (2021). Evaluating Walkability through a Multi-Criteria Decision Analysis Approach: A Lisbon Case Study. *Sustainability*, 13(3), 1450. <https://doi.org/10.3390/su13031450>

- McDonald, B., Scharf, T., & Walsh, K. (2021). Older people's lived experience and the World Health Organization age-friendly policy framework: A critical examination of an age-friendly county programme in Ireland. *Ageing and Society*, 1–26. <https://doi.org/10.1017/S0144686X21001355>
- Middleton, J. (2011). Walking in the City: The Geographies of Everyday Pedestrian Practices. *Geography Compass*, 5(2), 90–105. <https://doi.org/10.1111/j.1749-8198.2010.00409.x>
- Moreno, C., Allam, Z., Chabaud, D., Gall, C., & Pratlong, F. (2021). Introducing the “15-Minute City”: Sustainability, Resilience and Place Identity in Future Post-Pandemic Cities. *Smart Cities*, 4(1), 93–111. <https://doi.org/10.3390/smartcities4010006>
- Mysyuk, Y. (2020). *Urban Living Environment and Mental Health of Older People: A Photovoice Study*. <https://doi.org/10.21203/rs.3.rs-92729/v1>
- Nordbakke, S. (2013). Capabilities for mobility among urban older women: barriers, strategies and options. *Journal of Transport Geography*, 26, 166–174. <https://doi.org/10.1016/j.jtrangeo.2012.10.003>
- Noroozian, M. (2012). The elderly population in Iran: An ever growing concern in the health system. In *Iranian journal of psychiatry and behavioral sciences* (Vol. 6, Issue 2, pp. 1–6). Briefland.
- Ortega, E., Martín, B., De Isidro, Á., & Cuevas-Wizner, R. (2020). Street walking quality of the ‘Centro’ district, Madrid. *Journal of Maps*, 16(1), 184–194. <https://doi.org/10.1080/17445647.2020.1829114>
- Paykoç, E., & Akış, T. (2019). Analysis of Walkability Measurement Tools (Wmts). In *PQDT - Global*. <https://www.proquest.com/dissertations-theses/analysis-walkability-measurement-tools-wmts/docview/2572606811/se-2?accountid=8623>
- Pierce, M., Hope, H., Ford, T., Hatch, S., Hotopf, M., John, A., Kontopantelis, E., Webb, R., Wessely, S., McManus, S., & Abel, K. M. (2020). Mental health before and during the COVID-19 pandemic: a longitudinal probability sample survey of the UK population. *The Lancet Psychiatry*, 7(10), 883–892. [https://doi.org/10.1016/S2215-0366\(20\)30308-4](https://doi.org/10.1016/S2215-0366(20)30308-4)
- Rhodes, R. E., Courneya, K. S., Blanchard, C. M., & Plotnikoff, R. C. (2007). Prediction of leisure-time walking: an integration of social cognitive, perceived environmental, and personality factors. *International Journal of Behavioral Nutrition and Physical Activity*, 4(1), 51. <https://doi.org/10.1186/1479-5868-4-51>
- Ribeiro, A. I., & Hoffmann, E. (2018). Development of a Neighbourhood Walkability Index for Porto Metropolitan Area. How Strongly Is Walkability Associated with Walking for Transport? *International Journal of Environmental Research and Public Health*, 15(12), 2767. <https://doi.org/10.3390/ijerph15122767>

- Rioux, L., Werner, C. M., Mokoukolo, R., & Brown, B. B. (2016). Walking in two French neighborhoods: A study of how park numbers and locations relate to everyday walking. *Journal of Environmental Psychology*, 48, 169–184. <https://doi.org/10.1016/j.jenvp.2016.10.003>
- Rioux, L., Werner, C. M., Mokoukolo, R., & Brown, B. B. (2016). Walking in two French neighborhoods: A study of how park numbers and locations relate to everyday walking. *Journal of Environmental Psychology*, 48, 169–184. <https://doi.org/10.1016/j.jenvp.2016.10.003>
- Rodríguez, D. A., Evenson, K. R., Diez Roux, A. V., & Brines, S. J. (2009). Land Use, Residential Density, and Walking. *American Journal of Preventive Medicine*, 37(5), 397–404. <https://doi.org/10.1016/j.amepre.2009.07.008>
- Rodríguez, D. A., & Joo, J. (2004). The relationship between non-motorized mode choice and the local physical environment. *Transportation Research Part D: Transport and Environment*, 9(2), 151–173. <https://doi.org/10.1016/j.trd.2003.11.001>
- Rose, G. (2022). Visual methodologies: An introduction to researching with visual materials. *Visual Methodologies*, 1–100.
- Ruiz-Padillo, A., Pasqual, F. M., Larranaga Uriarte, A. M., & Cybis, H. B. B. (2018). Application of multi-criteria decision analysis methods for assessing walkability: A case study in Porto Alegre, Brazil. *Transportation Research Part D: Transport and Environment*, 63, 855–871. <https://doi.org/10.1016/j.trd.2018.07.016>
- Saelens, B. E., & Handy, S. L. (2008). Built Environment Correlates of Walking. *Medicine & Science in Sports & Exercise*, 40(7), S550–S566. <https://doi.org/10.1249/MSS.0b013e31817c67a4>
- Saelens, B. E., Sallis, J. F., Black, J. B., & Chen, D. (2003). Neighborhood-based differences in physical activity: an environment scale evaluation. *American Journal of Public Health*, 93(9), 1552–1558.
- Sallis, J. F., Cervero, R. B., Ascher, W., Henderson, K. A., Kraft, M. K., & Kerr, J. (2006). AN ECOLOGICAL APPROACH TO CREATING ACTIVE LIVING COMMUNITIES. *Annual Review of Public Health*, 27(1), 297–322. <https://doi.org/10.1146/annurev.publhealth.27.021405.102100>
- Sarigöl, M. (2022). *The impact of walkability on eudaimonic and hedonic well-being in equal eye-level street greenery neighborhoods*. Unpublished Master Thesis. Bilkent University, Turkey.
- Scumacker, R. E., & Lomax, R. G. (2010). *A beginner's guide to structural equation modeling*. (3rd Editon). New York: Taylor And Francis Group.
- Seles, E. (2021). *Development of a mixed-method approach to analyze walkability: A case on two urban residential neighborhoods in Ankara*. Unpublished PhD Thesis. Bilkent University, Turkey.

- Seles, E., & Afacan, Y. (2019). Exploring the relationship between health. *Open House International*.
- Shashank, A., & Schuurman, N. (2019). Unpacking walkability indices and their inherent assumptions. *Health & Place*, 55, 145–154. <https://doi.org/10.1016/j.healthplace.2018.12.005>
- Siren, A., & Hakamies-Blomqvist, L. (2004). Private car as the grand equaliser? Demographic factors and mobility in Finnish men and women aged 65+. *Transportation Research Part F: Traffic Psychology and Behaviour*, 7(2), 107–118. <https://doi.org/10.1016/j.trf.2004.02.003>
- Skinner, M. W., Cloutier, D., & Andrews, G. J. (2015). Geographies of ageing. *Progress in Human Geography*, 39(6), 776–799. <https://doi.org/10.1177/0309132514558444>
- Stewart, A. L., Mills, K. M., King, A. C., Haskell, W. L., Gillis, D., & Ritter, P. L. (2001). CHAMPS physical activity questionnaire for older adults: outcomes for interventions. *Medicine & Science in Sports & Exercise*, 33(7), 1126–1141.
- Sulaiman, I. M. (2020). Walkability in Different Contexts in Neighbourhood Planning: An Overview. *Architecture Research*, 2020(1), 27–43. <https://doi.org/10.5923/j.arch.20201001.04>
- Turkstat. (2019). *Population and Demography*.
- Van Cauwenberg, J., Van Holle, V., De Bourdeaudhuij, I., Clarys, P., Nasar, J., Salmon, J., Maes, L., Goubert, L., Van de Weghe, N., & Deforche, B. (2014). Physical environmental factors that invite older adults to walk for transportation. *Journal of Environmental Psychology*, 38, 94–103. <https://doi.org/10.1016/j.jenvp.2013.12.012>
- Wang, F., & Chen, F. (2023a). Factors Affecting Neighborhood Walkability: A Pilot Empirical Study in Qingdao, China. *Journal of Urban Planning and Development*, 149(1). <https://doi.org/10.1061/jupddm.upeng-4138>
- Wang, F., & Chen, F. (2023b). Factors Affecting Neighborhood Walkability: A Pilot Empirical Study in Qingdao, China. *Journal of Urban Planning and Development*, 149(1). <https://doi.org/10.1061/jupddm.upeng-4138>
- World Health Organization (WHO) (2002). *Active ageing: A policy framework*. World Health Organization.
- Wang, H., & Yang, Y. (2019). Neighbourhood walkability: A review and bibliometric analysis. *Cities*, 93, 43–61. <https://doi.org/10.1016/j.cities.2019.04.015>
- World Health Organization (WHO) (2018). *The global network for age-friendly cities and communities: Looking back over the last decade, looking forward to the next*. World Health Organization.
- World Health Organization (WHO). (2007). *Global Age-friendly Cities : a Guide*. World Health Organization.

- Willsher, K. (2020). Paris mayor unveils ‘15-minute city’ plan in re-election campaign. *The Guardian*, 7.
- Wong, R. C. P., Szeto, W. Y., Yang, L., Li, Y. C., & Wong, S. C. (2017). Elderly users’ level of satisfaction with public transport services in a high-density and transit-oriented city. *Journal of Transport & Health*, 7, 209–217. <https://doi.org/10.1016/j.jth.2017.10.004>
- Yang, Y., & Diez-Roux, A. V. (2012). Walking Distance by Trip Purpose and Population Subgroups. *American Journal of Preventive Medicine*, 43(1), 11–19. <https://doi.org/10.1016/j.amepre.2012.03.015>
- Yeung, P. (2021). *How ‘15-minute citie’ will change the way we socialise*, *BBC Worklife*. BBC Worklife. [https://www.bbc.com/worklife/article/20201214-how-15-minute](https://www.bbc.com/worklife/article/20201214-how-15-minute-...)
- Zandieh, R., Flacke, J., Martinez, J., Jones, P., & van Maarseveen, M. (2017). Do Inequalities in Neighborhood Walkability Drive Disparities in Older Adults’ Outdoor Walking? *International Journal of Environmental Research and Public Health*, 14(7), 740. <https://doi.org/10.3390/ijerph14070740>
- Zang, P., Liu, X., Zhao, Y., Guo, H., Lu, Y., & Xue, C. Q. L. (2020). Eye-Level Street Greenery and Walking Behaviors of Older Adults. *International Journal of Environmental Research and Public Health*, 17(17), 6130. <https://doi.org/10.3390/ijerph17176130>
- Zhang, J., Tan, P. Y., Zeng, H., & Zhang, Y. (2019). Walkability Assessment in a Rapidly Urbanizing City and Its Relationship with Residential Estate Value. *Sustainability*, 11(8), 2205. <https://doi.org/10.3390/su11082205>
- Zuniga Teran, A. A., Gimblett, R. H., & Orr, B. J. (2015). From neighborhoods to wellbeing and conservation: Enhancing the use of greenspace through walkability. In *ProQuest Dissertations and Theses*. <https://www.proquest.com/dissertations-theses/neighborhoods-wellbeing-conservation-enhancing/docview/1680014917/se-2?accountid=8623>
- Zuniga-Teran, A. A., Orr, B. J., Gimblett, R. H., Chalfoun, N. V., Going, S. B., Guertin, D. P., & Marsh, S. E. (2016). Designing healthy communities: A walkability analysis of LEED-ND. *Frontiers of Architectural Research*, 5(4), 433–452. <https://doi.org/10.1016/j.foar.2016.09.004>
- Zuniga-Teran, A., Orr, B., Gimblett, R., Chalfoun, N., Guertin, D., & Marsh, S. (2017). Neighborhood Design, Physical Activity, and Wellbeing: Applying the Walkability Model. *International Journal of Environmental Research and Public Health*, 14(1), 76. <https://doi.org/10.3390/ijerph14010076>

APPENDIX A

THE APPROVED ETHICS FORMS BY THE BILKENT UNIVERSITY ETHICS





Bilkent Üniversitesi

Akademik İşler Rektör Yardımcılığı

Tarih : 19 Kasım 2022
Gönderilen : Helya Fotovvat
Danışman : Yasemin Afacan
Gönderen : H. Altay Güvenir
İnsan Araştırmaları Etik Kurulu Başkanı
Konu : "Walking in ..." çalışması etik kurul onayı

Üniversitemiz İnsan Araştırmaları Etik Kurulu, 19 Kasım 2022 tarihli görüşme sonucu, "Walking in the neighborhood: Motivation and preference of older adults in Iran and Turkey" isimli çalışmanız kapsamında yapmayı önerdiğiniz etkinlik için etik onay vermiş bulunmaktadır. Onay, ekte verilmiş olan çalışma önerisi, çalışma yürütücüleri ve bilgilendirme formu için geçerlidir.

Bu onay, yapmayı önerdiğiniz çalışmanın genel bilim etiği açısından bir değerlendirmedir. Çalışmanızda, kurumumuzun değerlendirmesi dışında kalabilen özel etik ve yasal sınırlamalara uymakla ayrıca yükümlüsünüz.

Kovid-19 salgını nedeniyle konulmuş olan kısıtlamaların yürürlükte olduğu süre içinde, tüm komite toplantıları elektronik ortamda yapılmaktadır; aşağıda isimleri bulunan Bilkent Üniversitesi Etik Kurulu Üyeleri adına bu yazıyı imzalama yetkisi kurul başkanındadır.

Etik Kurul Üyeleri:

Ünvan / İsim	Bölüm / Uzmanlık	
Prof.Dr. H. Altay Güvenir	Bilgisayar Mühendisliği	Başkan
Prof.Dr. Erdal Onar	Hukuk	Üye
Prof.Dr. Haldun Özaktaş	Elektrik ve Elektronik Müh.	Üye
Doç.Dr. Işık Yuluğ	Moleküler Biyoloji ve Genetik	Üye
Dr. Öğr. Üyesi Burcu Ayşen Ürgen	Psikoloji	Üye
Dr. Öğr. Üyesi Didem Özkul McGeoch	İletişim ve Tasarımı	Yedek Üye
Dr. Öğr. Üyesi A.Barış Özbilen	Hukuk	Yedek Üye

Kurul karar/toplantı No: 2022_11_19_03

(Form Student_EN')

Ethics form for graduate and undergraduate students - human participants

Note - group projects fill in one copy with all your names on it. Consult your project supervisor for advice before filling in the form.

Your name(s): **Helya Fotovvat,**
Project Supervisor: Assoc.Prof. Dr. Yasemin Afacan

- A. Write your name(s) and that of your supervisor above.
- B. Read section 2 that your supervisor will have to sign. Make sure that you cover all these issues in section 1. Discuss what you are going to put on the form with your project supervisor.
- C. Sign the form and get your project supervisor to complete section 2 and sign the form.

1. Project Outline (to be completed by student(s))

(i) Full Title of Project:

Walking in the neighborhood: Motivation and preference of older adults in Iran and Turkey

(ii) Aims of project:

As Assoc. Prof. Dr. Yasemin Afacan from I.D. Bilkent University and Master Student Helya Fotovvat from I.D. Bilkent University, we are currently studying on walking in the neighborhood. Therefore, we aim to evaluate the mediators and moderators of older adults' transport walking in Iran and Turkey.

Also, some sub-factors (i) Explore whether the mediator factors differ in each country. (ii) Explore whether the moderator factors differ in each country. (iii) Explore socio-demographic factors that moderate the association between neighborhood qualities and transport walking. (iv) Explore neighborhood qualities that motivate older adults to walk for transport. (v) Explore neighborhood qualities that older adults prefer for transport walking.

The answers will be collected anonymously by Helya Fotovvat.

(iii) What will the participants have to do? (brief outline of procedure; please draw attention to any manipulation that could possibly be judged as deception; for survey work, a copy of the survey should be attached to this form):

A questionnaire consists of three sections will be filled out. The first section is about demographic questions. Then in second section self-reported walking for transport. The third section is neighborhood walking assessment level which consist of neighborhood qualities questions.

(iv) What sort of people will the participants be and how will they be recruited? In the case of children state age range. (Any participant who has not lived through his/her 18th birthday is considered to be a child!)

They will be Iranian and Turkish older adults. All participants are above 60 years old.

*If you are testing children or other vulnerable individuals, state whether all applicants have CRB** clearance*

(v) What sort stimuli or materials will your participants be exposed to? Tick the appropriate boxes and then explain the form that they take in the space below, please draw attention to any content that could conceivably upset your participants).

Questionnaires ☒ ; Pictures ☐ ; Sounds ☐ ; Words ☐ ; Caffeine ☐ ; Alcohol ☐ ; Other ☐.

They will answer questionnaires via Computer-Assisted web and personal interviewing (CAWI and CAPI).

(vi) Consent Informed consent must be obtained for all participants before they take part in your project. The form should clearly state what they will be doing, drawing attention to anything

* Adapted from www.york.ac.uk/depts/psych/www/research/ethics/HumanProjForm.doc

* Criminal Records Bureau - Please attach relevant clearance documentation.

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HEF

YA.

(Form Staff_EN')

Staff Application Form for Experiments with Human Participants

(A separate application form must be completed for each experiment and staff member.)

Please check one: ☐ I need a formal approval letter for an external agency (TÜBİTAK, etc.)

☒ An internal communication letter informing me of the approval will be sufficient

1. Name of applicant (graduate students should indicate their supervisors)

Assoc. Prof. Dr. Yasemin Afacan

2. Funder of grant/studentship if any:

3. Full title of experiment/project

Walking in the neighborhood: Motivation and preference of older adults in Iran and Turkey

4. When do you wish to start data collection: 20.11.2022

5. Aims of project:

As Assoc. Prof. Dr. Yasemin Afacan from I.D. Bilkent University and Master Student Helya Fotovat from I.D. Bilkent University, we are currently studying on walking in the neighborhood. Therefore, we aim to evaluate the mediators and moderators of older adults' transport walking in Iran and Turkey.

Also, some sub-factors (i) Explore whether the mediator factors differ in each country. (ii) Explore whether the moderator factors differ in each country. (iii) Explore socio-demographic factors that moderate the association between neighborhood qualities and transport walking. (iv) Explore neighborhood qualities that motivate older adults to walk for transport. (v) Explore neighborhood qualities that older adults prefer for transport walking.

The answers will be collected anonymously by Helya Fotovat. They will answer questionnaires via Computer-Assisted web and personal interviewing (CAWI and CAPI).

6. What will the participants have to do? (Provide a brief outline of procedure, for survey work, a copy of the survey should be attached to this form.) Please indicate if the participants may be exposed to stimuli which may upset them:

A questionnaire consists of three sections will be filled out. The first section is about demographic questions. Then in second section self-reported walking for transport. The third section is neighborhood walking assessment level which consist of neighborhood qualities questions.

7. What sort of people will the participants be and how will they be recruited? In the case of children state age range. (Any participant who has not lived through his/her 18th birthday is considered to be a child!)

They will be Iranian and Turkish older adults. All participants are above 60 years old.

8. Arrangements for consent and debriefing (attach information sheet and consent form)

They will be informed about 'Walking in the neighborhood: Motivation and preference of older adults in Iran and Turkey' study through the announcement in social media. After they read the consent form, they are asked whether they continue or quit the experiment and allow them to quit if they want.

9. How will you guarantee confidentiality of participants?

Adapted from www.york.ac.uk/depts/psych/www/research/ethics/StaffPGEthicsForm.doc

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The participants will be anonymous. We will not ask any personal information except their gender, age, education, health status and occupation. This information will be kept by Helya Fotovvat and will not be shared and will be destroyed after the data analysis. This aspect is also given as information at the beginning of the experiment.

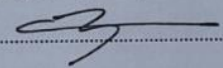
10. Please e-mail an electronic version of this word processed form (without signatures) along with other application material to the committee to start the evaluation process. Paper copies of all application material, (properly signed where indicated, and initialed on all other pages) should be sent after possible modifications suggested by the committee are finalized.

Signature(s):

Person carrying out the work:

Master student: Helya Fotovvat.....

Supervisor, grant holder, or Principal Investigator: I am satisfied that the procedures adopted will ensure the dignity, welfare and safety of all participants in this work.

Assoc. Prof. Dr. Yasemin Afacan.....

The signature above signifies that researchers will conform to the accepted ethical principles endorsed by relevant professional bodies, in particular to

Declaration of Helsinki (WMA):
<http://www.wma.net/en/30publications/10policies/b3/index.html>

Ethical Principles of Psychologists and Code of Conduct (APA):
<http://www.apa.org/ethics/code2002.html>

Ethical Standards for Research with Children (SRCR):
<http://www.srcd.org/about-us/ethical-standards-research>

Bilkent University does not allow the use of students of research investigators as participants. Students who have the potential of being graded by the investigators during or following the semester(s) in which the study is being carried out should not participate in the study. Students may not receive any credit for any university course, with the exception of the GE250/GE251 courses, for their participation. The GE250 and GE251 (Collegiate Activities I and II) courses include an optional activity which encompasses volunteering as a participant in a research project.

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they could conceivably object to subsequently. It should be in language that the person signing it will understand. It should also state that they can withdraw from the study at any time and the measures you are taking to ensure the confidentiality of data. If children are recruited from schools you will require the permission of the head teacher, and of parents. Children over 14 years should also sign an individual consent form themselves. When testing children you will also need Criminal Records Bureau clearance. Testing to be carried out in any institution (prison, hospital, etc.) will require permission from the appropriate authority. (Please include documentation for such permission.)

Who will you seek permission from?

Please attach the consent form you will use. Write the "brief description of study" in the words that you will use to inform the participants here.

INFORMED CONSENT

The study aims to evaluate the mediators and moderators of older adults' transport walking in Iran and Turkey. Also, some sub-factors (i) Explore whether the mediator factors differ in each country. (ii) Explore whether the moderator factors differ in each country. (iii) Explore socio-demographic factors that moderate the association between neighborhood qualities and transport walking. (iv) Explore neighborhood qualities that motivate older adults to walk for transport. (v) Explore neighborhood qualities that older adults prefer for transport walking.

Your answers will be collected anonymously. Your responses will remain confidential.

We do not foresee any risks or discomfort from your participation in the study.

Your participation in the study is on a voluntary basis and you have the choice not to participate. Your identity will remain anonymous; your choice will not have an impact on any relationship to the investigator (Helya Fotovvat) and will not affect the research outcome.

You may contact with Helya Fotovvat (helya.fotovvat@bilkent.edu.tr) for any further questions.

(vii) Debriefing - how and when will participants be informed about the experiment, and what information you intend to provide? If there is any chance that a participant will be 'upset' by taking part in the experiment what measures will you take to mitigate this?

They will be informed about 'Walking in the neighborhood: Motivation and preference of older adults in Iran and Turkey' study through the announcement in social media. After they read the consent form, they are asked whether they continue or quit the experiment and allow them to quit if they want.

(viii) What procedures will you follow in order to guarantee the confidentiality of participants' data? Personal data (name, addresses etc.) should only be stored if absolutely necessary and then only in such a way that they cannot be associated with the participant's experimental data.

There is no name or address needed in questionnaire and also all given answers anonymously taken by participation.

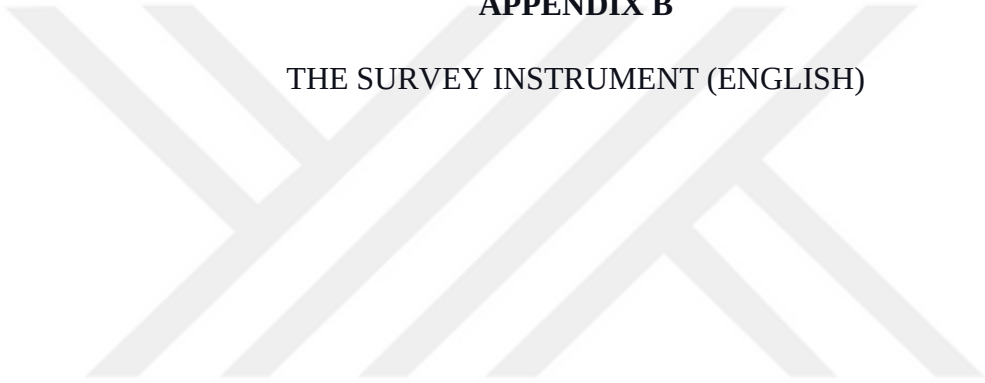
(ix) Give brief details of other special issues the ethics committee should be aware of.

(x) Tick any of the following that apply to your project

☐ it uses Bilkent facilities;

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Helya Fotovvat
Helya

7A.



APPENDIX B

THE SURVEY INSTRUMENT (ENGLISH)

Consent Form

Number of the participant:

Name of the study: *Walking in the neighborhood: Motivation and preference of older adults in Iran and Turkey*

The study aims to evaluate the mediators and moderators of older adults' transport walking in Iran and Turkey. Also, some sub-factors (i) Explore whether the mediator factors differ in each country. (ii) Explore whether the moderator factors differ in each country. (iii) Explore socio-demographic factors that moderate the association between neighborhood qualities and transport walking. (iv) Explore neighborhood qualities that motivate older adults to walk for transport. (v) Explore neighborhood qualities that older adults prefer for transport walking.

Your answers will be collected anonymously. Your responses will remain confidential.

We do not foresee any risks or discomfort from your participation in the study.

Your participation in the study is on a voluntary basis and you have the choice not to participate. Your identity will remain anonymous; your choice will not have an impact on any relationship to the investigator (Helya Fotovvat) and will not affect the research outcome.

You may contact with Helya Fotovvat (helya.fotovvat@bilkent.edu.tr) for any further questions.

I _____, understood the objectives of this study and I want to participate in voluntarily. My sign is the prove of my approval.

Signature:

Date:

I, Helya Fotowat, explained the aim, expectation and the methodology of this study, and also, I will keep participant information in confidential.

Signature:

Date:

Thesis questionnaire

A: Demographic

A1. Age:

☐ 60-74 ☐ 75-84 ☐ 85 and above

A2. Gender:

☐ Male ☐ Female

A3. Education:

☐ Primary School ☐ Middle School ☐ High School or Equivalent ☐ Bachelor ☐ Graduate

A4. Income level:

☐ 5.000- 9.999TL ☐ 10.000- 14.999TL ☐ 15.000- 19.999TL ☐ 20.000- 29.999TL ☐ Above 30.000TL

A5. Car ownership:

☐ I Own a Car ☐ I Do Not Own a Car

A6. Partner status:

☐ Single ☐ Married ☐ Widow

A7. Neighborhood type:

☐ Urban core ☐ Suburb ☐ Rural ☐ Master-planned communities

B: Self-reported walking for transport

Think about the time you spent walking in the last 7 days. This includes at work and at home, walking to travel from place to place

B1. How many days did you walk for at least 10 minutes at a time? _____ days ☐ No walking

B2. How much time did you usually spend walking on one of those days?

_____ hours per day _____ minutes per day ☐ Don't know/Not sure

B3. Where do you prefer to walk?

- ☐ Near home environment (neighborhood area within 10–15-minute walk from home)
- ☐ Within the neighborhood environment (neighborhood area within 30-minute walk from home).
- ☐ Out of the neighborhood environment (In another neighborhood or out of the urban environment).

B4. Which aspect do you prefer from the following choices? Please check one or more choices depending on your preference.

☐ Comfort and safety ☐ Land use ☐ Connectivity of street ☐ Aesthetics ☐ Access to facilities

B5. About how long would it take to get from your home to the nearest businesses or facilities listed below if you walked to them? Please put only one check mark (v) for each business or facility.

	1-5 min	6-10 min	11-20 min	21-30 min	31+ min	don't know
Convenience/small grocery store supermarket						
laundry/dry cleaners						
clothing store						
post office						
fast food restaurant/ coffee place						
bank/credit union						
pharmacy/drug store						
salon/barber shop						
your job						
bus or trolley stop						
park /recreation centre						
gym or fitness facility						

C. Neighborhood walkability assessment

Please rate your agreement level.

Access to services	
C1	I can do most of my shopping at local stores. Strongly disagree ☐ ☐ ☐ ☐ ☐ Strongly agree
C2	There are places and stores to go within easy walking distance of my home. Strongly disagree ☐ ☐ ☐ ☐ ☐ Strongly agree
C3	It is easy to walk to a transit stop (bus, train) from my home. Strongly disagree ☐ ☐ ☐ ☐ ☐ Strongly agree
C4	The streets in my neighborhood are hilly, making my neighborhood difficult to walk in. Strongly disagree ☐ ☐ ☐ ☐ ☐ Strongly agree
C5	There are many canyons/hillsides in my neighborhood that limit the number of routes for getting from place to place. Strongly disagree ☐ ☐ ☐ ☐ ☐ Strongly agree
Streets in my neighborhood	
C6	There are walkways in my neighborhood that connect cul-de-sacs to streets, trails, or other cul-de-sacs. Strongly disagree ☐ ☐ ☐ ☐ ☐ Strongly agree
C7	There are walkways in my neighborhood that connect cul-de-sacs to streets, trails, or other cul-de-sacs. Strongly disagree ☐ ☐ ☐ ☐ ☐ Strongly agree
C8	The distance between intersections in my neighborhood is usually short (100 yards or less; the length of a football field or less). Strongly disagree ☐ ☐ ☐ ☐ ☐ Strongly agree
C9	There are many four-way intersections in my neighborhood. Strongly disagree ☐ ☐ ☐ ☐ ☐ Strongly agree
C10	There are many alternative routes for getting from place to place in my neighborhood. (I don't have to go the same way every time.) Strongly disagree ☐ ☐ ☐ ☐ ☐ Strongly agree
Places for walking and cycling	

C11	There are sidewalks on most of the streets in my neighborhood. Strongly disagree ☐ ☐ ☐ ☐ ☐ Strongly agree
C12	The sidewalks in my neighborhood are well maintained (paved, even, and not a lot of cracks). Strongly disagree ☐ ☐ ☐ ☐ ☐ Strongly agree
C13	There are bicycle or pedestrian trails in or near my neighborhood that are easy to get to. Strongly disagree ☐ ☐ ☐ ☐ ☐ Strongly agree
C14	Sidewalks are separated from the road/traffic by grass/dirt strip in my neighborhood by parked cars. Strongly disagree ☐ ☐ ☐ ☐ ☐ Strongly agree
Neighborhood surroundings	
C15	There are trees along the streets in my neighborhood. Strongly disagree ☐ ☐ ☐ ☐ ☐ Strongly agree
C16	Trees give shade for the sidewalks in my neighborhood. Strongly disagree ☐ ☐ ☐ ☐ ☐ Strongly agree
C17	There are many interesting things and attractive natural sights to look at while walking in my neighborhood. (Such as landscaping, views, buildings/homes) Strongly disagree ☐ ☐ ☐ ☐ ☐ Strongly agree
C18	My neighborhood is generally free from litter. Strongly disagree ☐ ☐ ☐ ☐ ☐ Strongly agree
Safety from traffic	
C19	There is so much traffic along the street I live and nearby on that it makes it difficult or unpleasant to walk in my neighborhood. Strongly disagree ☐ ☐ ☐ ☐ ☐ Strongly agree
C20	The speed of traffic on the street I live and nearby on is usually slow (30 mph or less). Strongly disagree ☐ ☐ ☐ ☐ ☐ Strongly agree
C21	There are crosswalks and pedestrian signals to help walkers' cross busy streets in my neighborhood. Strongly disagree ☐ ☐ ☐ ☐ ☐ Strongly agree
C22	When walking in my neighborhood, there are a lot of exhaust fumes (such as from cars, buses). Strongly disagree ☐ ☐ ☐ ☐ ☐ Strongly agree

APPENDIX C
THE SURVEY INSTRUMENT (TURKISH)



İran ve Türkiye'deki yaşlı yetişkinlerin yürüme motivasyonu ve tercihinde mahalle niteliklerinin temel rolü

İran ve Türkiye'de yaşlıların ulaşım yürüyüşünün aracı ve moderatörlerini değerlendirmeyi amaçlamaktadır.

Ayrıca, bazı alt faktörler (i) Aracı faktörlerin her ülkede farklılık gösterip göstermediğini. (ii) Moderatör faktörlerin her ülkede farklılık gösterip göstermediği. (iii) Sosyo-demografik faktörlerinin mahalle nitelikleri ve ulaşım yürüyüşü arasındaki ilişkiyi yönetmesini. (iv) Yaşlı yetişkinleri ulaşım için yürümeye motive eden mahalle nitelikleri. (v) Mahallede yaşlı yetişkinlerin ulaşım yürüyüşü için tercih ettiği nitelikler.

Yanıtlarınız gizli kalacaktır.
Çalışmaya katılımlınızdan herhangi bir risk veya rahatsızlık beklemiyoruz.
Araştırmaya katılımlınız gönüllülük esasına dayalıdır ve katılmama seçeneğiniz vardır.

Ulaşım yürüyüşü belirli bir hedefe yürüyerek ulaşmak(İşe, alışverişe, bankaya vb.), ve gündelik işlerinizi yapmak için yürümektir. Aşağıdaki soruları cevaplarken ulaşım yürüyüşünüzü düşünerek cevaplayın.

Sorularınız için Helya Fotovvat (helya.fotovvat@bilkent.edu.tr) ile iletişime geçebilirsiniz.

A: Demografik Bilgiler

A1.Yaş Gurubu

Yaşınız:

- ☐ 60-74 ☐ 75-84 ☐ 85 üstü

A2. Cinsiyet

- ☐ Kadın ☒ Erkek

A3. Eğitim Derecesi:

- ☐ ilk okul altı ☐ İlk okul ☐ Orta okul ☐ Lise ☐ Lisans ya da Dengi Okul ☐ Yüksek Lisans ☐ Doktora

A4. Kişisel Aylık Gelir Düzeyi:

- ☐ 8500TL altı ☐ 8500- 19000TL ☐ 19000- 24.500TL ☐ 24.500- 29000 ☐ 30.000TL üzeri

A5. Otomobil Sahipliği:

- ☐ Otomobilim Var ☐ Otomobilim yok

A6. Medeni Hali

- ☐ Bekâr ☐ Evli ☐ Dul

A7. Ne tür bir mahallede yaşıyorsunuz?

- ☐ Şehir merkezinde ☐ Şehir merkezinden uzakta(+5km) ☐ Köy ☐ Site

A8. Şehir ve ikamet yeri (Mahalle):.....

B: Ulaşım yürüyüşünün kişisel bildirimi

Geçen 7 gün içerisinde işe gidip gelirken, gündelik işlerinizi yaparken veya bir yerden bir yere gidip gelirken sadece yürüdüğünüz zamanları düşünün.

B1. Bir seferde en az 10 dakika yürüdüğünüz gün sayısı kaçtır?.....

B2. Bu günlerden birinde bir yerden bir yere yürümek için genellikle ne kadar zaman geçirdiniz?.....

B3. Nerede ulaşım yürüyüşünüzü yapmayı tercih edersiniz?

- ☐ Yakın ev ortamı (Eve 10-15 dk'lık yürüme mesafelerinde)
- ☐ Mahalle ortamında (Eve 30 dakikalık yürüme mesafelerinde)
- ☐ Mahalle ortamının dışında.

B4. Ulaşım yürüyüşünüzü düşündüğünüzde aşağıdaki seçeneklerden hangilerini daha çok tercih edersiniz? Lütfen tercihinize bağlı olarak bir veya daha fazla seçeneği işaretleyin.

- ☐ Konfor ve güvenlik ☐ Arazi kullanımı ☐ Sokak bağlantısı ☐ Estetik ☐ Tesislere erişim

B5. Aşağıda listelenen en yakın işyerlerine veya tesislere yürüyerek, evinizden yaklaşık ne kadar sürede giderseniz? Lütfen her işletme veya tesis için yalnızca bir onay işareti (✓) koyun.

	1-5 dakika	6-10 dakika	11-20 dakika	21-30 dakika	31+ dakika	Bilmiyorum
Küçük bakkal süpermarket						
Çamaşırhane/kuru temizlemeciler						
Giyim mağazası						
Postane						
Restoranı / kafe						
Banka						
Eczane/ Hastane						
kuaför/berber						
iş yeri						
Otobüs veya tramvay durağı						
Park / eğlence merkezi						

Spor salonu veya fitness tesisi						
---------------------------------	--	--	--	--	--	--

B6. Bu tesislere genellikle ne zaman gitmeyi tercih edersiniz?

☐ Gündüz ☐ Gece

B7. Bu tercihinizin nedenleri nedir?(Lütfen tercihinize göre bir veya birden fazla seçeneği işaretleyiniz).

☐ Hava durumu/iklimsel nedenler ☐ Kültürel sebepler ☐ Çalışma saatleri nedeni ☐ Güvenlik sebepleri

C. Mahallede ulaşım yürünebilirliğinin değerlendirmesi

Hizmetlere Erişim	
C1	Alışverişimin çoğunu yerel mağazalardan yapabilirim. Kesinlikle Katılmıyorum ☐ ☐ ☐ ☐ Kesinlikle Katılıyorum
C2	Evimden yürüme mesafesinde gidilecek birçok yer var.. Kesinlikle Katılmıyorum ☐ ☐ ☐ ☐ Kesinlikle Katılıyorum
C3	Evimden toplu taşıma durağına (otobüs, tren) yürümek kolaydır.. Kesinlikle Katılmıyorum ☐ ☐ ☐ ☐ Kesinlikle Katılıyorum
C4	Mahalle sokaklarım engebeli ve yürümeyi zorlaştırıyor.. Kesinlikle Katılmıyorum ☐ ☐ ☐ ☐ Kesinlikle Katılıyorum
C5	Mahalleimde bir yerden bir yere gitmek için yol sayısını sınırlandıran birçok kanyon/yamaç var.. Kesinlikle Katılmıyorum ☐ ☐ ☐ ☐ Kesinlikle Katılıyorum
Mahalledeki sokaklar	
C6	Mahalleimde çıkmaz sokakları, patikalara, veya başka bir çıkmaz sokağa bağlayan yürüyüş yolları var.. Kesinlikle Katılmıyorum ☐ ☐ ☐ ☐ Kesinlikle Katılıyorum
C7	Mahalledeki kavşaklar arasındaki mesafe genellikle kısadır (Bir futbol sahası uzunluğunda veya daha az).. Kesinlikle Katılmıyorum ☐ ☐ ☐ ☐ Kesinlikle Katılıyorum
C8	Mahalleimde bir çok kavşak var. Kesinlikle Katılmıyorum ☐ ☐ ☐ ☐ Kesinlikle Katılıyorum
C9	Mahalleimde bir yerden diğer bir yere yürüyerek ulaşmak için birçok alternatif yol var. Kesinlikle Katılmıyorum ☐ ☐ ☐ ☐ Kesinlikle Katılıyorum
Yürüyüş ve bisiklet için yerler	
C10	Mahalledeki sokakların çoğunda kaldırım var. Kesinlikle Katılmıyorum ☐ ☐ ☐ ☐ Kesinlikle Katılıyorum
C11	Mahalledeki kaldırımlar iyi durumda (Asfaltlı, düz ve çok fazla çatlak yok). Kesinlikle Katılmıyorum ☐ ☐ ☐ ☐ Kesinlikle Katılıyorum

C12	Mahalleimde veya yakınında ulaşımı kolay bisiklet veya yaya yolları var. Kesinlikle Katılmıyorum ☐ ☐ ☐ ☐ Kesinlikle Katılıyorum
C13	Mahalleimdeki kaldırımlar yoldan veya trafikten çim,yağmur oluğu ve park edilmiş arabalarla ayrılmıştır. Kesinlikle Katılmıyorum ☐ ☐ ☐ ☐ Kesinlikle Katılıyorum
Mahalle çevresi	
C14	Mahallemin sokaklarında ağaçlar var. Kesinlikle Katılmıyorum ☐ ☐ ☐ ☐ Kesinlikle Katılıyorum
C15	Mahalleimdeki kaldırımlara ağaçlar gölge verir. Kesinlikle Katılmıyorum ☐ ☐ ☐ ☐ Kesinlikle Katılıyorum
C16	Mahalleimde yürürken bakılacak pek çok ilginç şey ve çekici doğal manzara var. (Peyzaj düzenlemesi, manzaralar, binalar/evler gibi) Kesinlikle Katılmıyorum ☐ ☐ ☐ ☐ Kesinlikle Katılıyorum
C17	Mahalleim genellikle temizdir. Kesinlikle Katılmıyorum ☐ ☐ ☐ ☐ Kesinlikle Katılıyorum
Trafik güvenliği	
C18	Sokaklarda o kadar çok trafik var ki mahalleimde yürümeyi zorlaştırıyor veya tatsız hale getiriyor. Kesinlikle Katılmıyorum ☐ ☐ ☐ ☐ Kesinlikle Katılıyorum
C19	Mahalleimdeki trafik hızı genellikle yavaştır (50 Km veya daha az). Kesinlikle Katılmıyorum ☐ ☐ ☐ ☐ Kesinlikle Katılıyorum
C20	Mahalleimde yayaların yoğun caddeleri geçmesine yardımcı olmak için yaya geçitleri ve yaya işaretleri var. Kesinlikle Katılmıyorum ☐ ☐ ☐ ☐ Kesinlikle Katılıyorum
C21	Mahalleimde hava karadıktan sonra yürümeyi güvenli ve kolay hale getiren sokak lambaları var. Kesinlikle Katılmıyorum ☐ ☐ ☐ ☐ Kesinlikle Katılıyorum
C22	Mahalleimde yürürken çok fazla egzoz dumanı çıkıyor (arabalardan, otobüslerden çıkanlar gibi). Kesinlikle Katılmıyorum ☐ ☐ ☐ ☐ Kesinlikle Katılıyorum

APPENDIX D

THE SURVEY INSTRUMENT (FARSI)



پرسشنامه

نام و نام خانوادگی شرکت کننده (اختیاری):

عنوان پژوهش: **پیاده روی در محله (انگیزه و ترجیح سالمندان برای پیاده روی روزانه در ایران و ترکیه)**

این مطالعه با هدف ارزیابی واسطه‌ها و مدیریت انگیزه و ترجیحات در پیاده‌روی غیر تفریحی سالمندان ایران و ترکیه می‌باشد. همچنین شامل برخی عوامل فرعی از جمله: الف) بررسی امکان متفاوت بودن عوامل واسطه در دو کشور. ب) بررسی امکان متفاوت بودن عوامل مدیریت کننده در دو کشور. ج) بررسی عوامل اجتماعی جمعیت شناختی که در نقش مدیریت کننده ی ارتباط بین کیفیت محله و پیاده روی غیر تفریحی می‌باشند. د) بررسی ویژگی‌های محله ای که به افراد سالمند در پیاده روی غیر تفریحی انگیزه می‌دهند. ه) بررسی ویژگی‌های محله ای که افراد سالمند برای پیاده روی غیر تفریحی ترجیح می‌دهند.

پاسخ‌های شما به صورت ناشناس جمع‌آوری خواهند شد و محرمانه خواهند ماند.

ما هیچ خطر یا ناراحتی از شرکت شما در این پژوهش را پیش‌بینی نمی‌کنیم.

شرکت شما در پژوهش به صورت داوطلبانه است و اختیار شرکت و یا عدم شرکت به عهده خود شما می‌باشد. هویت شما ناشناس باقی خواهد ماند. انتخاب شما هیچگونه تاثیری بر ارتباط شما با محقق (هلیا فتوت) نخواهد گذاشت و تاثیری روی نتایج این پژوهش نخواهد گذاشت. برای سوالات بیشتر می‌توانید با هلیا فتوت به آدرس ایمیل helya.fotovvat@bilkent.edu.tr در تماس باشید.

اینجانب.....اهداف این پژوهش را درک کردم و می‌خواهم داوطلبانه در آن شرکت کنم.

تاریخ

امضا

اینجانب هلیا فتوت، هدف، انتظارات و روش تحقیق این پژوهش را توضیح دادم و همچنین اطلاعات شرکت کنندگان را به صورت محرمانه حفظ خواهیم کرد.

تاریخ

امضا

الف) اطلاعات شرکت کننده

الف.1) سن

74-60 ☐ 84-75 ☐ بالای 85 ☐

الف.2) جنسیت

زن ☐ مرد ☐

الف.3) وضعیت تحصیلی

بی سواد ☐ ابتدایی ☐ سیکل ☐ دیپلم ☐ لیسانس ☐ فوق لیسانس ☐ دکتری ☐

الف.4) میزان درآمد ماهانه

زیر 7 میلیون ☐ 7-15 میلیون ☐ 16-24 میلیون ☐ 25 تا 32 میلیون ☐ بالای 32 میلیون ☐

الف.5) دارای خودروی شخصی

بله ☐ خیر ☐

الف.6) وضعیت تاهل

مجرد ☐ متاهل ☐ مجرد بعد از تاهل ☐

الف.7) در چه نوع محله ای زندگی می کنید؟

مرکز شهر ☐ خارج/حومه شهر ☐ روستا ☐ محلات محصور دارای نگهداری درب ورودی ☐

الف.8) نام شهر:..... و نام محله:.....

ب) گزارش فردی برای پیاده روی غیر تفریحی

با توجه به مدت زمانی که در 7 روز گذشته صرف پیاده روی کرده اید (شامل: رفتن به محل کار، یا برگشتن به خانه و پیاده روی از مکانی به مکان دیگر مثلاً برای خرید و غیره) به سوالات زیر پاسخ دهید.

ب.1) چند روز حداقل 10 دقیقه پیاده روی غیر تفریحی انجام داده اید؟.....

ب.2) چه مدت زمانی شما معمولاً صرف پیاده روی در یکی از این روزها کرده اید؟.....

ب.3) کجا ترجیح می دهید پیاده روی کنید؟

- در محیط نزدیک به خانه (10 تا 15 دقیقه پیاده روی از خانه) □.
- در محیط داخل محله (30 دقیقه پیاده روی از خانه) □.
- خارج از محیط محله (در محله ای دیگر یا خارج از محیط شهری) □.

ب.4) کدام جنبه از گزینه های زیر را برای پیاده روی ترجیح می دهید؟ (می توانید یک یا بیش از یک مورد را انتخاب کنید).

- راحتی و امنیت □
- کاربری اراضی در پیاده روی (جنبه اقتصادی: مثل پیاده روی در مراکز خرید، شهری مثل پیاده روی در خیابان و پارک منطقه ای مثل پیاده روی در دربند تهران یا گاوزنگ زنجان) □
- ارتباط خیابان ها در پیاده روی □
- زیبایی محیط □
- دسترسی به امکاناتی مثل آنچه که در جدول پائین ذکر شده است □
- ب.5) تقریباً چقدر طول می کشد تا از خانه خود به نزدیک ترین کسب و کارها یا امکانات فهرست شده در زیر بروید؟ لطفاً برای هر کسب و کار یا تسهیلات فقط یک علامت (✓) قرار دهید.

نمیدانم	1-5 دقیقه	6-10 دقیقه	11-20 دقیقه	21-30 دقیقه	31+ دقیقه	
						سوپر مارکت و خواربارفروشی
						خشک شویی
						فروشگاه لباس
						اداره پست
						رستوران فست فود / قهوه خانه
						بانک
						داروخانه/بیمارستان
						آرایشگاه
						محل کار

						ایستگاه های اتوبوس/مترو/تاکسی
						پارک و مراکز تفریحی
						سالن ورزشی

ب.6) معمولاً چه زمانی ترجیح می دهید به این مکان ها بروید؟

در طول روز ☐ در شب ☐

ب.7) دلیل شما برای این انتخاب چیست (لطفاً یک یا چند انتخاب را بسته به ترجیح خود انتخاب کنید).

دلایل آب و هوایی / اقلیمی ☐ دلایل فرهنگی ☐ بدلیل ساعات اداری ☐ بدلیل امنیتی ☐

ج) ارزیابی پیاده روی در محله (از زیاد یعنی کاملاً موافقم تا کم یعنی کاملاً مخالفم یک مربع می توانید انتخاب کنید).

دسترسی به خدمات	
C1	من می توانم بیشتر خریدهایم را از فروشگاه های محلی انجام دهم. کاملاً موافقم ☐ ☐ ☐ ☐ کاملاً مخالفم
C2	مکان ها و فروشگاه هایی وجود دارد که می توان از خانه من به راحتی پیاده به آنجا رفت. کاملاً موافقم ☐ ☐ ☐ ☐ کاملاً مخالفم
C3	پیاده رفتن به ایستگاه حمل و نقل عمومی مانند اتوبوس از خانه من آسان است. کاملاً موافقم ☐ ☐ ☐ ☐ کاملاً مخالفم
C4	خیابان های محله من تپه ای است و راه رفتن در محله من را دشوار می کند. کاملاً موافقم ☐ ☐ ☐ ☐ کاملاً مخالفم
C5	پستی و بلندی های زیادی در محله من وجود دارد که تعداد مسیرها را برای رفتن از جایی به مکان دیگر محدود می کند. کاملاً موافقم ☐ ☐ ☐ ☐ کاملاً مخالفم
خیابان های محله ی من	
C6	مسیرهایی در محله ی من وجود دارد که بن بست ها را به خیابان ها، کوچه ها و بن بست های دیگر وصل می کند. کاملاً موافقم ☐ ☐ ☐ ☐ کاملاً مخالفم
C7	مسافت بین تقاطع ها در محله من معمولاً کوتاه است (طول یک زمین فوتبال یا کمتر). کاملاً موافقم ☐ ☐ ☐ ☐ کاملاً مخالفم
C8	چهارراه های زیادی در محله من وجود دارد کاملاً موافقم ☐ ☐ ☐ ☐ کاملاً مخالفم
C9	مسیرهای جایگزین زیادی برای رفتن از جایی به جای دیگر در محله ی من وجود دارد. (من مجبور نیستم هر بار همان مسیر را بروم). کاملاً موافقم ☐ ☐ ☐ ☐ کاملاً مخالفم
مکان هایی برای پیاده روی و دوچرخه سواری	

C10	در بیشتر خیابان های محله من پیاده رو وجود دارد. کاملا موافقم ☐ ☐ ☐ ☐ ☐ کاملا مخالفم
C11	پیاده روهای محله من به خوبی نگهداری می شوند (مفروش شده و یا آسفالت، یکنواخت، و ترک های زیادی ندارند). کاملا موافقم ☐ ☐ ☐ ☐ ☐ کاملا مخالفم
C12	در محله من یا نزدیک آن مسیرهای دوچرخه یا عابر پیاده وجود دارد که دسترسی به آنها آسان است. کاملا موافقم ☐ ☐ ☐ ☐ ☐ کاملا مخالفم
C13	پیاده روها توسط چمن یا جوی از خیابان جدا می شوند. کاملا موافقم ☐ ☐ ☐ ☐ ☐ کاملا مخالفم
محیط محله	
C14	در امتداد خیابان های محله ی من درختان و پوشش گیاهی وجود دارد. کاملا موافقم ☐ ☐ ☐ ☐ ☐ کاملا مخالفم
C15	درختان باعث ایجاد سایه در مسیر پیاده رو ها می شوند. کاملا موافقم ☐ ☐ ☐ ☐ ☐ کاملا مخالفم
C16	هنگام قدم زدن در محله من چیزهای جالب زیادی و مناظر طبیعی جذاب زیادی وجود دارد که می توان به آنها نگاه کرد. (مانند محوطه سازی، نماها، ساختمان ها/خانه ها). کاملا موافقم ☐ ☐ ☐ ☐ ☐ کاملا مخالفم
C17	محله من کلا "عاری از زباله است". کاملا موافقم ☐ ☐ ☐ ☐ ☐ کاملا مخالفم
ایمنی از ترافیک	
C18	در امتداد خیابانی که من زندگی می کنم و در نزدیکی آن ترافیک زیادی وجود دارد که راه رفتن در محله را برای من دشوار یا ناخوشایند می کند. کاملا موافقم ☐ ☐ ☐ ☐ ☐ کاملا مخالفم
C19	سرعت ترافیک در خیابانی که من زندگی می کنم و در نزدیکی آن معمولا آهسته است (50 کیومتر در ساعت یا کمتر). کاملا موافقم ☐ ☐ ☐ ☐ ☐ کاملا مخالفم
C20	در محله من خطوط عابر پیاده و علائم عابر پیاده برای کمک به پیاده روها برای عبور از خیابان های شلوغ وجود دارد. کاملا موافقم ☐ ☐ ☐ ☐ ☐ کاملا مخالفم
C21	چراغ هایی در خیابان های محله من وجود دارد که بعد از تاریکی راه رفتن را ایمن و آسان می کند. کاملا موافقم ☐ ☐ ☐ ☐ ☐ کاملا مخالفم
C22	هنگام قدم زدن در محله من، دود آگروز زیادی (از ماشین ها و اتوبوس ها) وجود دارد. کاملا موافقم ☐ ☐ ☐ ☐ ☐ کاملا مخالفم

APPENDIX E

MAP OF THE CITIES AND NEIGHBORHOODS



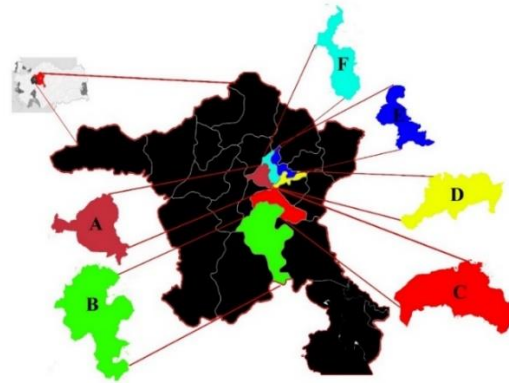


Figure 6. Chosen districts of Ankara: A) Yenimahalle, B) Gölbaşı, C) Çankaya, D) Altındağ, E) Pursaklar, F) Keçiören. (Drawn by the author, 2023).

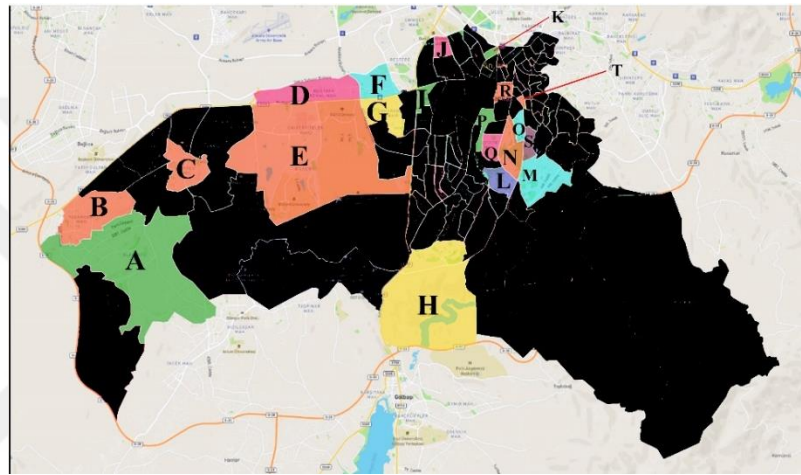


Figure 7. Chosen neighborhoods of Çankaya district; A) Alacaatlı; B) Yaşamkent; C) Çayyolu; D) Mustafa Kemal; E) Üniversiteler; F) Söğütözü; G) Çukurambar; H) Oran; I) Balgat; J) Bahçelievler; K) Korkutreis; L) Yıldızevler; M) Birlik; N) Çankaya; O) Gaziosmanpaşa; P) Ayrancı; Q) Aziziye; R) Kavaklıdere; S) Kazım Özalp; T) Küçükesat. (AtlasBig).

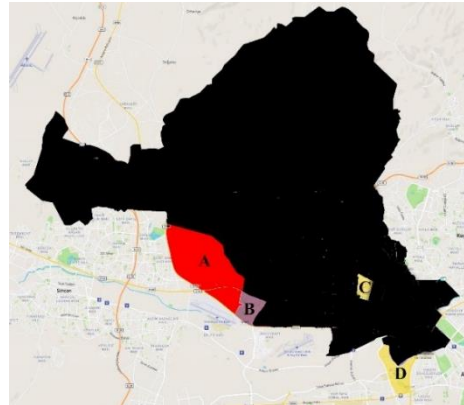


Figure 8. Chosen neighborhoods of Yenimahalle. A) Batı; B) Ergazi; C) Demetevler, D) Beştepe. (AtlasBig).

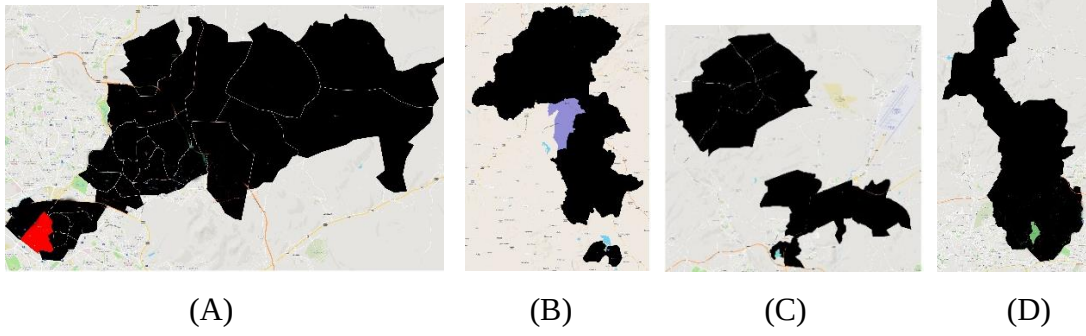


Figure 9. Chosen neighborhoods of Altındağ, Gölbaşı, Pursaklar, and Keçiören; (A) Hacı Bayram neighborhood of Altındağ district; (B) Karagedik neighborhood of Gölbaşı district; (C) Ayyıldız neighborhood of Pursaklar district; (D) İncirli neighborhood of Keçiören district (AtlasBig).



Figure 10. Chosen district of Antalya; (A) Map of Türkiye. Antalya is shown in red. (B) Map of Antalya. Muratpaşa district of Antalya is shown in red. (C) Map of Muratpaşa district (Drawn by the author, 2023).

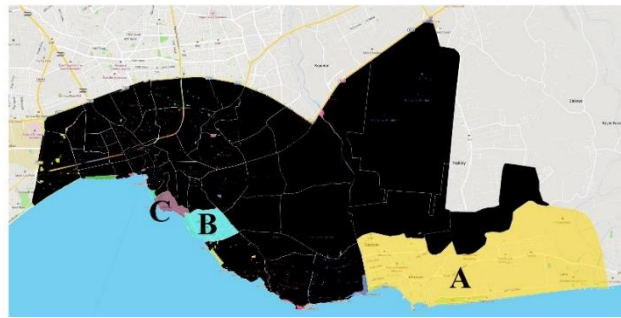


Figure 11. Chosen neighborhoods of Muratpaşa district; A) Güzeloba; B) Yeşilbahçe; C) Gençlik (AtlasBig).

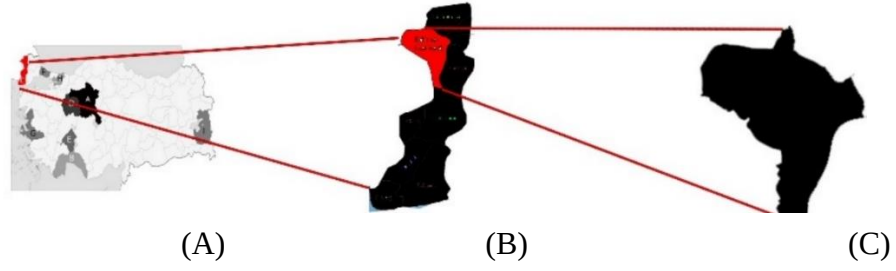


Figure 12. Chosen district of Edirne; (A) Map of Türkiye. Edirne is shown in red. (B) Map of Edirne. Edirne Merkez district of Antalya is shown in red. (C) Map of Edirne Merkez district (Drawn by the author, 2023).

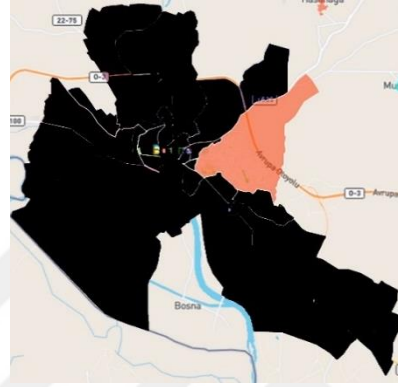


Figure 13. Map of Şükrüpaşa neighborhood in Edirne Merkez. (AtlasBig).

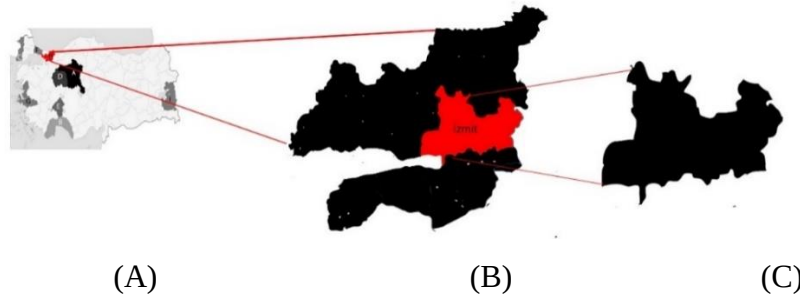


Figure 14. Chosen district of Kocaeli; (A) Map of Türkiye. Kocaeli is shown in red; (B) Map of Kocaeli. İzmit district of Kocaeli is shown in red; (C) Map of İzmit district (Drawn by the author, 2023).



Figure 15. Map of Doğan neighborhood in İzmit district. (AtlasBig).

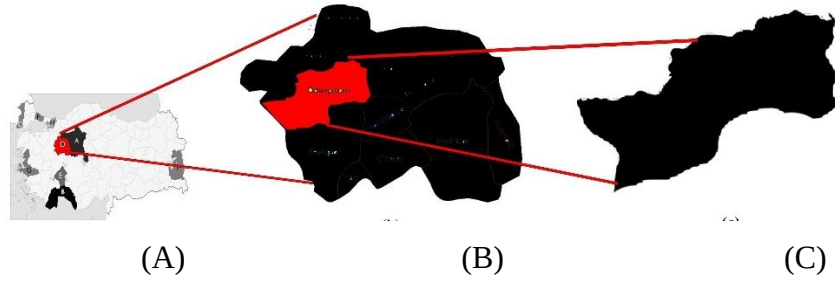


Figure 16. Chosen district of Eskişehir; (A) Map of Türkiye. Eskişehir is shown in red. (B) Map of Eskişehir. Odunpazarı district of Eskişehir is shown in red. (C) Map of Odunpazarı district (Drawn by the author, 2023).

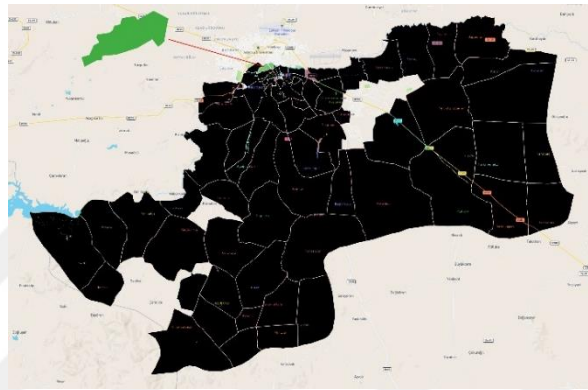


Figure 17. Map of Kızıltoprak neighborhood in Odunpazarı district. (AtlasBig).

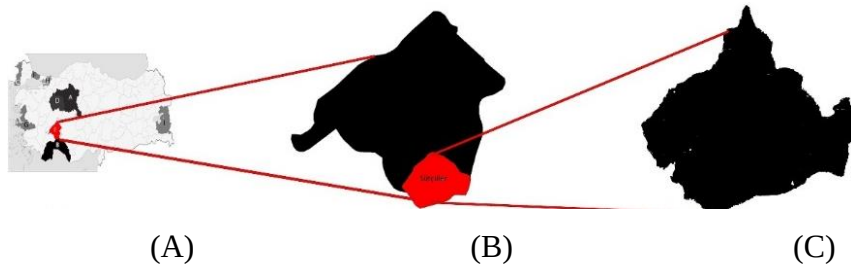


Figure 18. Chosen district of Isparta; (A) Map of Türkiye. Isparta is shown in red. (B) Map of Isparta. Sütçüler district of Isparta is shown in red. (C) Map of Sütçüler district (Drawn by the author, 2023).

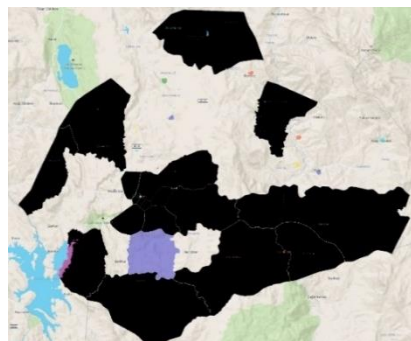


Figure 19. Map of Sarımehter neighborhood in Sütçüler district. (AtlasBig).



(A)

(B)



(C)

(D)

(E)

Figure 20. Chosen neighborhoods of Istanbul; (A) Emniyetevleri neighborhood of Kağıthane district, (B) Miamarsinan neighborhood of Büyükçekmece district, (C) Güven neighborhood of Güngören district, (D) Gümüşsuyu neighborhood of Beyoğlu district, (E) Aksaray neighborhood of Fatih district. (AtlasBig).

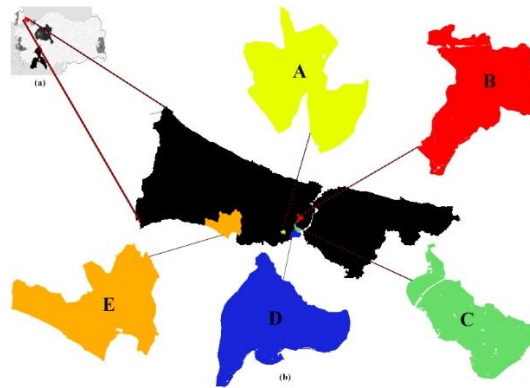


Figure 21. Chosen districts of Istanbul; Map of Türkiye. Istanbul is shown in red; Map of Istanbul. Districts are shown in colors: A) Güngören, B) Kağıthane, C) Beyoğlu, D) Fatih, E) Büyükçekmece (Drawn by the author, 2023).

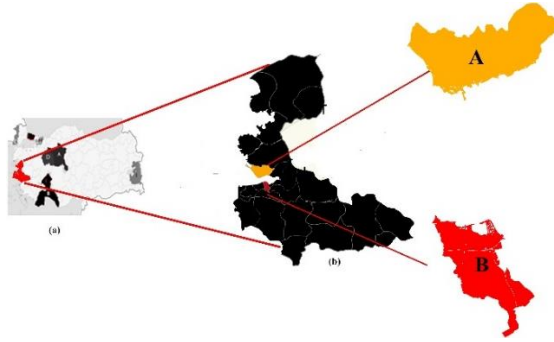


Figure 22. Chosen districts of Izmir; Map of Türkiye. Izmir is shown in red; Map of Izmir. Districts are shown in colors: A) Çiğli, B) Balçova (Drawn by the author, 2023).



Figure 23. Chosen neighborhoods of Izmir; (A) Eğitim neighborhood of Balçova district, (B) Evka-2 neighborhood of Çiğli district. (AtlasBig).

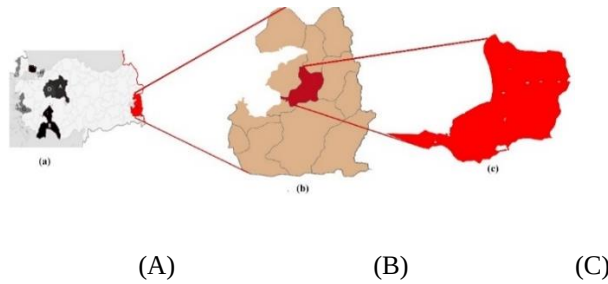


Figure 24. Chosen district of Van; (a) Map of Türkiye. Van is shown in red. (b) Map of Van. Ippekyolu districts are shown in red. (c) Map of Ippekyolu district. (Drawn by the author, 2023).

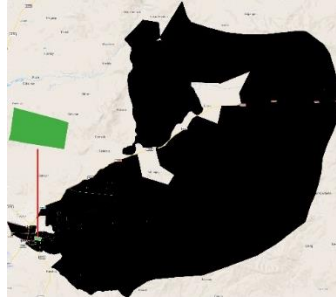


Figure 25. The Cumhuriyet neighborhood in the Ipekyolu district. (AtlasBig).

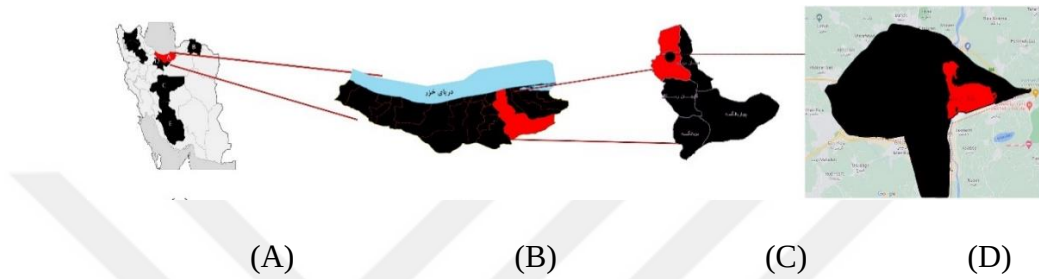


Figure 26. The chosen neighborhood of Sari; (A) Map of Iran. Mazandaran Province is shown in red. (B) Map of Mazandaran Province. Sari County is shown in red. (C) Map of Sari County. The central district is shown in red, and Sari City location is shown with a black dot. (D) Map of Sari City. Emamzadeh Abbas neighborhood is red (Drawn by the author, 2023).

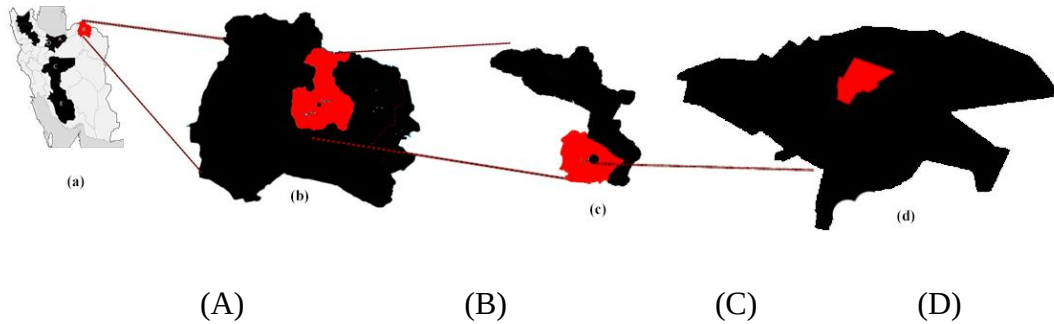


Figure 27. The chosen neighborhood of Bojnourd; (A) Map of Iran. North Khorasan Province is shown in red. (B) Map of North Khorasan Province. Bojnourd County is shown in red. (C) Map of Bojnourd County. The central district is shown in red, and Bojnourd City is shown with a black dot. (D) Map of Bojnourd City. Takhti neighborhood is shown in red. (Drawn by the author, 2023).

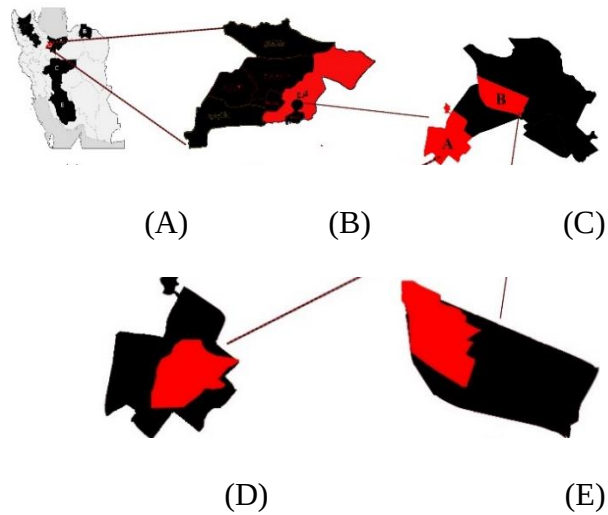


Figure 28. Chosen neighborhoods of Karaj; (A) Map of Iran. Alborz Province is shown in red. (B) Map of Alborz Province. Karaj County is shown in red, and Karaj City is shown with a black dot. (C) Map of Karaj City; A) The Third District; B) The Fifth District. (D) Map of the third district. Mehrshahr neighborhood is shown in red. (E) Map of the fifth district. Hesarak neighborhood is shown in red. (Drawn by the author, 2023).

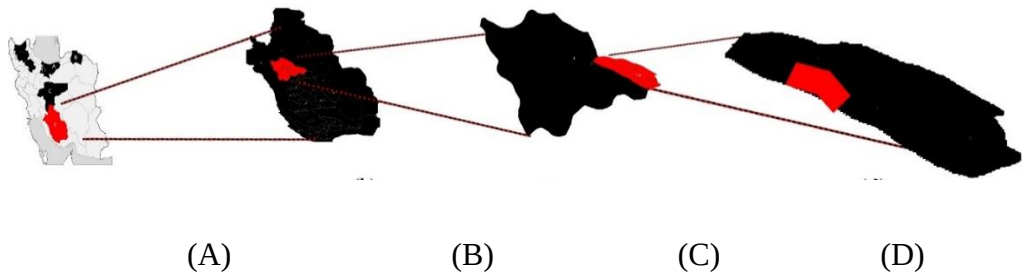


Figure 29. The chosen neighborhood of Shiraz; (A) Map of Iran. Fars Province is shown in red. (B) Map of Fars Province. Shiraz City is shown in red. (C) Map of Shiraz City. The Third District is shown in red. (D) Map of the Third District. Haftanan neighborhood is shown in red. (Drawn by the author, 2023).

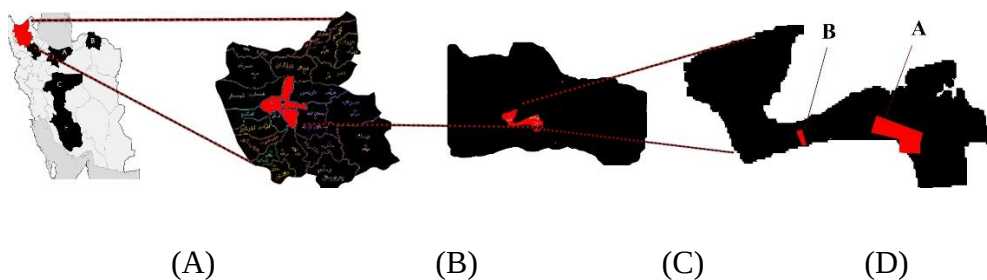


Figure 30. Chosen neighborhoods of Tabriz; (A) Map of Iran. East Azerbaijan Province is shown in red. (B) Map of East Azerbaijan Province. Tabriz County is shown in red, and Tabriz City is shown with a black dot. (C) Map of Tabriz City. The Seventh District is shown in red. (D) Map of the Seventh District; A) Golbad and B) Lalezar neighborhoods are shown in red. (Drawn by the author, 2023).

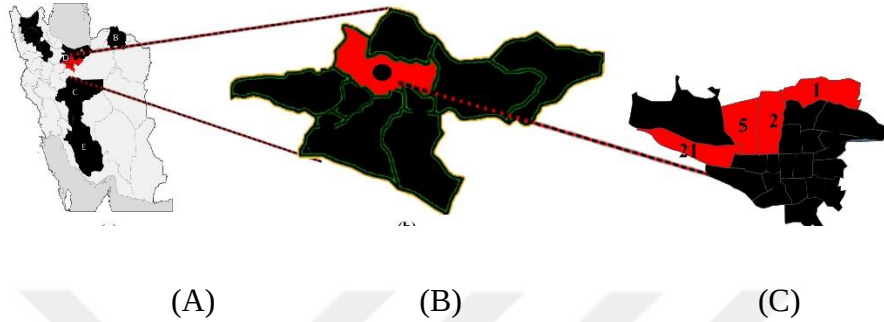


Figure 31. Chosen districts of Tehran; (A) Map of Iran. Tehran Province is shown in red. (B) Map of Tehran Province. Tehran County is shown in red, and Tehran City is shown with a black dot. (C) Map of Tehran City. The First, Second, Fifth, and Twenty-first Districts are red. (Drawn by the author, 2023).

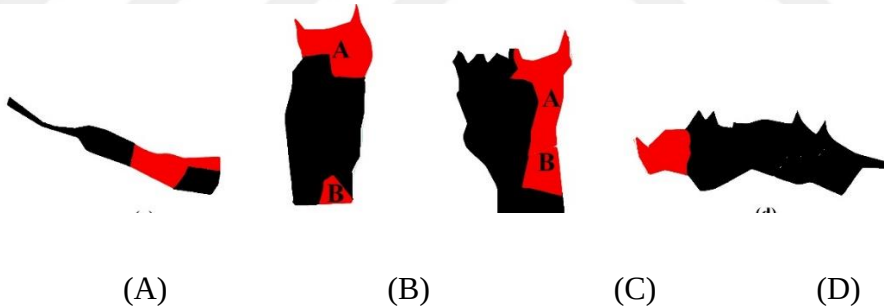


Figure 32. Chosen neighborhoods of Tehran; (A) Map of the First District; Velenjak neighborhood is shown in red; (B) Map of the Second District; A) Saadatabad and B) Sattarkhan neighborhoods are shown in red; (C) Map of the Fifth District; A) North Shahrān and B) Ashrafi Esfahani neighborhoods are shown in red. (D) The map of the Twenty-first district, the Tehransar neighborhood, is shown in red. (drawn by the author, 2023).

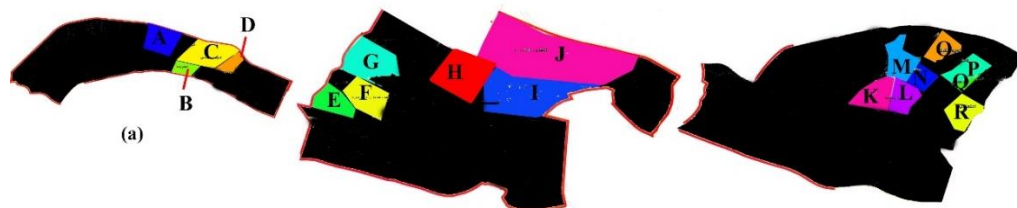


Figure 33. Chosen neighborhoods of Zanjan; A) Nasr, B) Olunpayeh, C) Shahrakkarmandan. D) Payinkooh. E) Sarjangaldari, F) Vahidiyeh, G) Ansariyeh, H) Manzariyeh, I) Poonak, J) Golshahr, K) Zeinabieh, L) Saadi, M) Saadi Shomali, N) Safa, O) Koochemeshk, P) Bisim, Q) Daneshsara R) Etemadieh. (Drawn by the author, 2023).

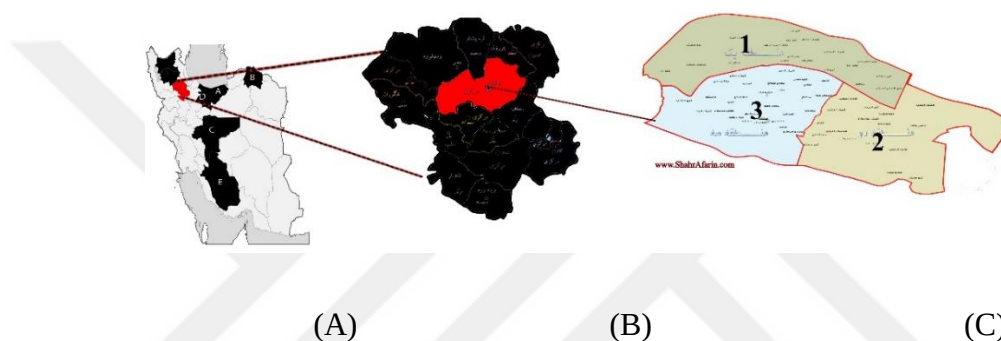


Figure 34. Chosen districts of Zanjan; (A) Map of Iran. Zanjan Province is shown in red. (B) Map of Zanjan Province. Zanjan County is shown in red, and Zanjan City is shown with a black dot. (C) Map of Zanjan City. The First, Second, and Third Districts are shown in red. (Drawn by the author, 2023).

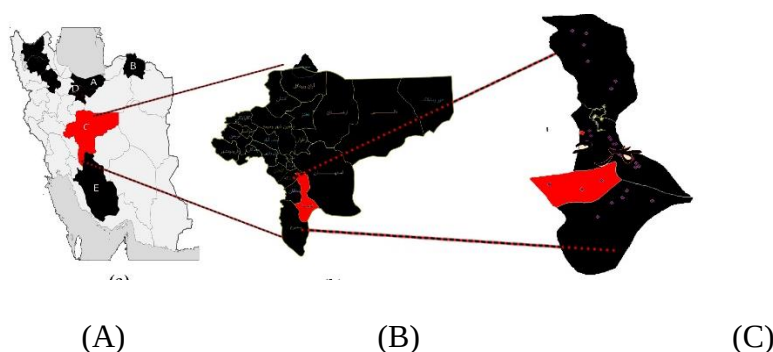


Figure 35. The chosen neighborhood of Esfahan; (A) Map of Iran. Esfahan Province is shown in red. (B) Map of Esfahan Province. Shahreza City is shown in red. (C) Map of Shahreza City. Yazdani neighborhood is shown in red. (Drawn by the author, 2023).