

URBAN WALKABILITY RESEARCH IN TURKEY: TRENDS, CHALLENGES, AND FUTURE DIRECTIONS

ARAF OYKU TURKEN ^{a *}, CENK HAMAMCIOGLU ^b,

^{a b} *Department of Urban and Regional Planning, Yildiz Technical University, Istanbul, Turkey*

**corresponding author: aturken@yildiz.edu.tr*

1. Introduction

Walking is a fundamental form of transport and a sustainable, healthy way of experiencing the city. However, walking behavior contains complicated decision mechanisms based on personal attitudes, preferences, and environmental variables [1], and it can be conducted with various motivations and in different types, such as utilitarian, social, and recreational [2]. So, studies related to walkability/walking behavior have many layers to understanding real-life situations and pedestrian dynamics. From an urbanistic perspective, especially with the new urbanism movement, accessing activities for daily life within walking distance is highlighted in terms of neighborhood design [3]; walkability is associated with quality of urban space, activities, and walking as a tool for boosting pedestrian culture and urban advantage [4], and several researchers focus on pedestrian movements, public space and urban life for better cities [5], [6]. Recently, with the impact of the pandemic, the importance of walkability and proximity-based ideas became more visible in the urban agenda [7].

Despite the existence of planning documents, such as the national development plan and several strategic and action plans, which espouse pedestrian-centric approaches, numerous cities in Turkey continue to exhibit deficiencies in infrastructure and the absence of comprehensive systems for green transportation. However, in general, urban transportation strategies are less oriented towards bicycles and pedestrians than other modes of transportation [8]. Accordingly, the objective of this paper is to gain insight into the pattern of urban walkability research in Turkey by analyzing academic studies in the WoS database. To this end, the following questions will be addressed:

Q1: What are the emerging trends in urban walkability studies in Turkey, and what sub-topics and scales are commonly used in these studies?

Q2: What are the overstudied areas and neglected dimensions of walking-related studies in Turkey?

2. Materials and methods

This study adopts a systematic approach to analyze urban walkability research patterns in Turkey-based cases to reveal trends, challenges, and needs for future directions. In that manner, articles in the WoS database were scanned with relevant keywords [(walkability OR "pedestrian behavior" OR "walking behavior" OR "pedestrian movement" OR "pedestrian mobility") AND (turkey OR "türkiye")]. Some were eliminated through urban walkability perspective, duplications, inclusion

of case studies (Turkey), and limited access to full texts. Accordingly, selected articles are categorized into sub-topics such as walkability assessments, walking behavior and its relation with "x," pedestrian-centric approaches, and walking types. Furthermore, the interrelations between parameters are visualized with a Sankey chart to show cumulation dynamics in the research area and direct further research in Turkey.

3. Results

Sub-categorization is conducted through three main highlights following the evaluation of abstracts manually (Figure 1). The first of these is the walkability assessment, which encompasses approaches that employ multi-parameters to measure, score, and evaluate the walkability of a given area. The second category, 'walking behavior and its relation with "x"', includes studies that seek to understand walkability or walking behavior in relation to other concepts or adopt a more limited perspective on the subject. The third category is studies focusing on pedestrian movement from a pedestrian-centric and individual experience perspective.

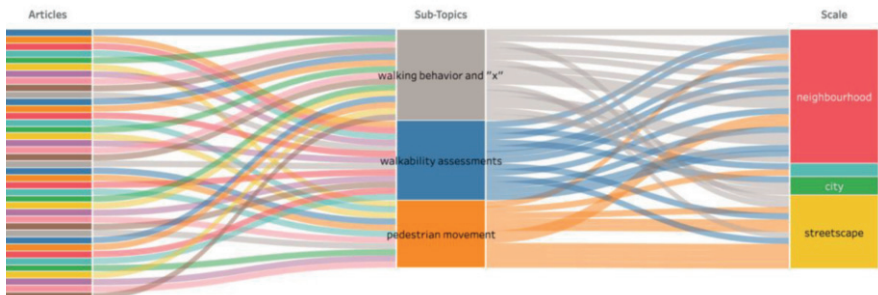


Figure 1. Spatial representation of the Majestic station with mapped user routes overlaid over each other to identify conflict zones

3.1 Walkability Assessments

In a simple sense, scoring walkability refers to metrics, indices, or sets of measures that allow us to classify parameters related to walkability in a specific systematic. In that manner, GIS-based approaches are pretty popular regarding built-environment-focused analytic scorings[9]. Relatedly, also in Turkey-cases, several studies conducted assessments often using Space-Syntax or/both GIS analysis; in that context, Şahin-Körmeçli [10] evaluated street network accessibility in Cankiri; Gundogdu [11] examined and scored eleven different axes in the Tekirdag city center considering spatial structure and pedestrian numbers; Akbaba et.al. [12] interested with evaluation of bicycle and walking paths via GIS in Ankara, Ege neighbourhood; Ünal-Çilek [13] design a spectrum for categorizing optimum pedestrian routes to access urban green space through walkability criteria. Some of the studies adopt neighborhood-scale study areas (mostly in Ankara or İstanbul) and also use observatory approaches to consider pedestrian dynamics and to integrate multi-layer perspectives such as Yildirim et. al.'s study [14] about Besiktas which is overlapped spatial analysis, space-syntax (connectivity, local/global integration analysis, mean dept) and mobile techniques; Ozbil et. al. [15] also integrate pedestrian flows and micro & macro-environmental features to compare peripheral neighborhoods in different districts in İstanbul; Ghanat-Bari & Tekel [16] created a walkability index with a survey and spatial analysis considering streetscape values and so on.

3.2 Walking behavior and its relation with "x"

Walking is associated with several topics in urban planning practices. In Turkey-based cases, it has also been seen that it is also often studied through age (for vulnerable groups), as well as proximity/accessibility to facilities. In terms of age-based approaches, children's behavior or route choices to school are subject to several studies [17], [18], [19]; and Bayar & Yılmaz [20] use quantitative data to measure the age-friendliness of urban space through a spatial perspective. Another study interested older adults' life satisfaction related to urban space and accessibility [21]. Apart from that, some studies concrete on accessibility/proximity issues through specific amenities; for instance, Senol et al. [22] discussed park accessibility linked with environmental justice for disadvantaged groups through plans; additionally, Unal et al. [23] calculated service areas of urban green spaces with network analysis at Cukurova considering accessibility dynamics. Durmaz et al. [24] mentioned the relationship between walkability and creative clusters and some advantages of walking distance; additionally, Kahya [25] interested with pedestrian use, street network and art events relation. As another focus, Yildirim et al. [26] examined the difference between low/high social and economic status women's neighborhood walkability perspectives.

3.3 Pedestrian-centric approaches

Regarding pedestrian-centric approaches, some studies use multiple observations to reveal pedestrian dynamics in urban environments, while others focus on pedestrian safety and crossing behavior in more detail. These studies were separated in terms of the scale of the area they studied and the scope of what they searched for. Related to the pedestrian movement-oriented ones, for instance, Yılmaz & Kurkcuoglu analyze pedestrian movement in Istiklal Street in a quantitative way and measure walking speeds, density and flow, personal space of pedestrians [27]; Kesici & Erkan reveal pedestrian movements in two nodes in public space to understand public façade characteristics and behavior relation [28], one of the other study is focus on linkage of pedestrian density, spatial feature and activity in a pedestrianized zone [29]. While other studies concrete on walking habits and its connection with illegal crossing behaviors [30], the gap distance between pedestrians [31], cultural differences between pedestrian behaviors in five countries including Turkey [32]. Related to the all, Tuydes-Yaman & Karatas [33] highlighted the obvious disconnection between walkability and pedestrian level of service concepts and put forward suggestions about it, and conduct field studies in METU Campus [34].

4. Conclusions

A comprehensive city-scale walking score incorporating perceptual and built environment parameters has yet to be developed for cases in Turkey. Despite Istanbul and Ankara being subjects of extensive study, existing research in these cities is characterized by fragmentation in terms of the research zones and parameters examined. The majority of studies have concentrated on analyses at the neighborhood level and on the built environment. Additionally, some studies concentrate on walking behavior through the lenses of quality of life, age-oriented and proximity perspectives, and the impact of digitalization. This indicates a deficiency in the development of an integrated, city-wide walkability assessment that incorporates both physical infrastructure and user perceptions. Most studies do not clearly define the types of walking behavior under investigation, with only a few studies mentioning recreational walking behaviors. Conversely, there has been a recent surge of interest in these research areas in Turkey, as evidenced by the growing number of academic case studies. Based on reviewed papers, there has been a shift in research trends lately rather than pedestrian movement-oriented approaches and toward exploring walkability overall or with broader themes such as health, sustainability, and urban quality of life.

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