



Article How Do Psychosocial Barriers Shape Public Transport Use? A Mixed-Method Study among Older Adults in Pakistan

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Abstract: Transport can significantly contribute to independent and healthy ageing, but in Pakistan as in various other countries across the globe-many older adults are dependent on others. Agesensitive transport environments are crucial for generating positive experiences among older adults. Notably, psychosocial experiences significantly impact public transport use. Thus, a thorough understanding of these psychological influences on public transport accessibility can encourage walkability and independent mobility. In the present research, we combine different data into a mixed-method study to investigate the psychosocial barriers to public transport use by older adults for daily travel in Lahore, Pakistan. The data include a questionnaire survey (319 older adults), semi-structured interviews (11 older adults), structured interviews with four experts and an analysis of relevant national-, provincial-, and district-level strategies and transport plans. The findings show how poorly perceived social norms, negative emotional responses, and perceived difficulty are significant barriers to using public transport services among older adults. Moreover, the existing transport plans and documents do not favour and cater to such psychosocial issues. Several strategic interventions that could promote walkability and public transport use are suggested. It includes activating social norms, raising awareness and information, providing social support, improving walking infrastructure and public transport services, pricing mechanisms, and offering specialised services. These initiatives, however, necessitate coordination among government authorities at the national, provincial, and district levels.

Keywords: psychosocial; public transport; older adults; Pakistan; mixed-method

1. Introduction

Active travel can enable access to essential socio-economic resources, opportunities for activity participation, and social inclusion [1,2]. The way people travel impacts their wellbeing and that of others [3]. Travel mode choice is influenced by perceptions of transport modes [4], political contexts and settings, financing mechanisms, and the natural and built environment [5].

The transportation system in Pakistan is marked by limited public transport availability and utilization [6], lower walkability, and high private automobile use [7]. At the same time, Pakistan ranks depressingly low in the Global AgeWatch Index (GAWI), at 92 out of 96 countries included, reflecting a lower level of life quality and well-being among Pakistani older adults. A large segment of older adults in the country remains deprived of socio-economic opportunities and cannot participate in socio-economic activities effectively [8]. They are socially excluded and face various disadvantages because they lack the travel means to address such concerns [9,10]. The physical activity levels and mobility of older adults in Pakistan are inadequate [11]. According to Adeel [12], age is positively



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Copyright: © 2022 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (https:// creativecommons.org/licenses/by/ 4.0/). related to social exclusion and immobility risk. Similarly, Ahmad and Batool [9] reported that as people get older, their travel frequency decreases, from 10.5 trips per week for those aged 60–64 to 5.6 trips per week for those aged 75 and above. Given the reported reductions in mobility and rises in social disadvantage in later life, the opportunity to use public transport to integrate physical activity into everyday living is essential.

Utilising public transportation is closely linked with walkability since it provides possibilities for social interaction and greater physical activity to and from transit stations [13–15]. Public transport, which is linked to potential health, facilitates access to health, education, and social services while maintaining independence and walking.

This is vital because older adults' mobility with public transport modes in Pakistan is negligible. The older adults in Pakistan only make an average of 3.2 trips per week by public transport [9], which is relatively low compared with other developed countries such as the USA, China, and South Korea [16–18]. Therefore, it is reflected that older adults in Pakistan prefer private-mode travel and have significantly less walkability [19,20]. Barriers to the use of public transport by Pakistani older adults include non-availability of transportation, poor walking infrastructure, boarding and alighting complexities, travel costs, physical handicaps, lack of safety, inconvenient service operation, and driver or crew behaviour [9,21–25].

Unlike the myriad of studies debating physical and situational attributes, there is little evidence on the psychosocial aspects that enable and constrain public transport use. The existing literature [26,27] suggests that the mobility of older adults depends not only on the built environment aspects and narrow biomedical model but also on a set of psychosocial factors, such as social relations, cultural norms, and the experiences of individuals. Thus, psychosocial variables are promising for assessing public transport-related constraints [28]. On the other hand, most research on the psychosocial aspects that influence public transport use is undertaken in developed countries [29,30]. Few have focused on small-to-medium-sized cities in the developing world, where behaviour and particular needs may differ [31]. Furthermore, recent studies such as [20,32,33] also suggest that psychosocial factors influence the public transport use behaviour of older adults differently due to their unique needs and activity patterns. It is critical to thoroughly appreciate and comprehend how this argument exists so that relevant strategies may be devised to maximise their impacts.

Given the above justifications, the primary focus of this research is to uncover the unique psychosocial barriers that shape public transportation usage behaviour among older adults in Lahore, Pakistan. Based on the Theory of Planned Behaviour (TPB), psychosocial factors, including social norms, public transport-related attitudes, and perceived behavioural control, are jointly examined via questionnaires and semi-structured interviews to disclose their impact on the target usage behaviour. The analyses were supplemented by a review of related national, provincial, and district transport policy documents and policymaker interviews to help determine possible initiatives to enhance walkability and public bus use.

The rest of this article is structured as follows. Section 2 provides a discussion on the theoretical background. Section 3 details a brief overview of the materials and methods. Section 4 explains the results, and the later sections critically discuss the study findings, their practical implications, research limitations, and future directions.

2. Theoretical Background

Existing research on the concerned psychosocial factors and their possible impact on the mobility of older adults have been evaluated in the following sub-sections to provide a rationale for later analysis.

2.1. Theory of Planned Behaviour

Prior research has shown that an individual's mobility and mode choice decisions are heavily influenced by psychosocial factors such as attitudes, beliefs, and aspirations [34,35].

The theory of planned behaviour (TPB) is a well-established and recognized theory that focuses on the psychological predictors of behaviour in various contexts [36]. The fundamental premise is that behavioural intention, which indicates whether a person will keep using a particular service or transfer to a new provider, determines actual behaviour [37]. In addition, three cognitive aspects, including subjective norm, attitude, and perceived behavioural control, are believed to influence intention. Specifically, the subjective norm refers to an individual's impression of how critical people in his life (e.g., families or friends) anticipate him to behave in particular ways, such as approval or disapproval. An individual's attitude reflects how he feels about a specific action or service. The extent to which an individual perceives his abilities and restrictions about the desired behaviour is perceived behavioural control [38,39].

The TPB has been used extensively In transport research. Results show that subjective norms, attitudes toward public transportation, perceived control over travel behaviour, and intention all play a role in determining the choice to use transport mode [40–44]. Similarly, public transport use is shaped by many psychosocial factors, including norms, attitudes about public transportation, and belief in the personal ability to satisfy unique travel demands with public transport services. In addition, various studies such as [30,31,42,45–49] have shown that individuals' beliefs, norms, attitudes, and habits significantly impact how they use public transportation. From the management and policy standpoint, it has also been widely claimed that 'soft' approaches, such as awareness programs to improve understanding of the environmental advantages of public transport modes, might stimulate their use [50–52].

2.2. Older Adults' Mobility and Psychosocial Influences

Travel patterns are among the most prominent indicators of ageing within western societies [53], emphasizing mobility differences among older adults. While this argument is based on developed countries, it also applies to Pakistan, where the mobility discrepancies in old age may be more significant.

The notion of 'older adult needs' is not as homogeneous as a century ago [54]. The socio-economic position of older adults has changed dramatically over the last few decades because of increased life expectancy and improved health, contributing to increased travel demand. Some researchers have noticed the ageing stereotype of being 'less-valued or useless' [55], indicating that older adults are unable or less motivated than younger counterparts to participate in necessary leisure or socio-economic activities. Studies demonstrate that older adults tend to have unique mobility patterns compared to other age groups [56]. Older adults depend more on others and do not have adequate mode choices, especially after driving cessation [57,58]. Moreover, they tend to have a shorter commute distance, probably because of their limited ability or sedentary lifestyles. On the other hand, older adults are more inclined to walk and use public transport, but psychological constraints restrict such travel patterns.

The psychosocial factors (e.g., personal attitude, perceived norms, and behavioural control) are crucial and substantially affect older adults' mobility. Older adults' fear about public transit has psychological components, including social and cultural norms [59]. In this regard, Mifsud and Attard [32] revealed that social norms are crucial in predicting future mobility intentions. In a longitudinal study, Mertens and Van Dyck [60] concluded that older adults who realize positive social norms for being physically active were more likely to use cycling for transport. Similarly, Van Holle and Van Cauwenberg [61] revealed a moderated effect of social norms on transport-related walking among older adults. Moreover, Van Dyck and Cardon [62] showed that older adults with higher perceived social modelling from their (grand)children were related to increased active transport behaviour. Likewise, in a recent study, [33,63] also pointed out that the perceived social norms towards public transport use are crucial to promoting social inclusion among women.

Like the perceived norms, the attitude towards public transport services also indirectly predicts public transport use behaviour among older adults. For example, Al-Rashid and

Goh [20] found that positive attitudes toward public transport significantly influence older adults' intention to use public transport services. Yang and Langellier [64] suggested that improving the older adults' attitudes, with the help of awareness campaigns for free bus policy, could promote public bus use. Moreover, Haustein [65] noticed that a positive attitude towards walking and public transport reduces car use among older adults. The quality of the public transport infrastructure is also crucial in developing a personal attitude. In line with this, Olawole and Aloba [66] revealed that the perceived service quality of public transportation and associated travel constraints significantly affect the travel attitude of older adults. Furthermore, the social influences and value orientations could also considerably impact the older adults' attitudes toward transport policies [67].

Mertens and Van Dyck [60] suggested that older adults with improved self-efficacy towards physical activity prefer to engage in transit instead of older adults with lower self-efficacy. Deka and Brown [68] hypothesized that the intrinsic characteristics of people, such as self-belief and motivation, greatly influence the travel of older adults. In a longitudinal study among older adults, Van Dyck and Cardon [62] predicted the changes in active transport behaviour due to changes in their self-efficacy or confidence during early retirement. Similarly, intentions or motivational features are a vital psychological factor for older adults' mobility and public transport use [69]. For instance, Laatikainen and Haybatollahi [70] suggested that personal goals linked to physical activities substantially impact walking. They found that the greater the value of physical activity-related goals, the more transport-related walking occurs among older adults.

As reviewed above, the unique travel needs of older adults have been extensively investigated. Notably, the role of psychosocial aspects is primarily examined in quantitative terms. However, there is little evidence on applying mixed-methods to understand the public transport use behaviour from a psychosocial perspective among older adults, which can reveal essential mobility insights.

3. Materials and Methods

3.1. Context

The present study was carried out in Lahore district, the capital of Punjab province in Pakistan. The geographical area of Lahore is 1772 square kilometres (1,77,200 hectares) and features flat terrain. It stretches from 74°10′ to 74°39′ E longitude and 31°15′ to 31°43′ N latitude in the north-eastern part of Punjab, adjacent to the border of India [71]. There are nine administrative zones and one cantonment within the district. According to the notification issued by the Government of the Punjab [72], there are a total of 274 Union Councils within the Lahore district. These union councils can also be referred to as neighbourhoods. Figure 1 shows the location and zone level administrative map of the Lahore district.

Given the geographical scope of the Lahore metropolitan area, it was challenging to cover the whole study area. Hence, to maintain the probability, this study utilized a multi-stage sampling approach to collect the data from older adults. Multi-stage sampling involves obtaining a sample from a population by splitting a study population into smaller and smaller groups and then performing a simple random selection to determine the samples [73–75]. Hence, two out of nine Municipal Administrative Zones were selected. Among these chosen zones, three neighbourhoods were chosen randomly. First, the researcher selected 'Gulberg Zone' and 'Data Gunj Buksh Zone'. Then, three neighborhoods within the Gulberg Zone, including Model Town, Garden Town, and Gulberg III, were selected. At the same time, the neighbourhoods of Mozang, Shadman, and Anarkali were chosen from Data Gunj Buksh Zone.

The urban public transport services in Lahore are divided into four categories: (1) mass rapid transit, which includes the metro train and buses, which are mainly regulated by the Punjab Mass-transit Authority (PMA); (2) intra-city bus services, which comprise a variety of low occupancy vehicles (such as Hilux, coasters) and are managed by the Lahore Transport Company (LTC); (3) paratransit services, where Qingqi rickshaws are the most dominant mode; and (4) ride hailing services such as Uber and Careem. The rickshaws primarily work individually on their preferred routes without any administrative control. Moreover, the people can book the ride-hailing services based on their needs and preferences. These paratransit and ride-hailing services provide transport facilities to the significant population in Lahore and facilitate the wider public transport modes. Figure 2 provides a visual depiction of these public transport modes in Lahore.



Figure 1. Zone-level Map of City District Lahore. Source: [20].



1. Bus Rapid Transit

2. Intra-city Bus Services

3. Para Transit Services (QingQi RickShaw)

Figure 2. Glimpses of the Public Transport Modes in Lahore.

3.2. Data

This research draws on multiple data sources while engaging various stakeholders to examine the psychosocial barriers to older adults using public transportation. Table 1 briefly summarizes each data source and the relevant research methodology.

Sr. No.	Data	Respondents	Recruitment Method	Data collection
1.	Older adults survey	319 older adults	Through house	15–20 min face-to-face questionnaire survey completed at their residence
2.	Older adults survey	11 older adults	Through house	45–50 min face-to-face semi-structured interview completed at their residence
3.	Policy analysis	14 documents	Websites	Keyword search in government documents
4.	Key informant interviews	04 policy-makers	Through professional connections	35 min per session 01 session per person

Table 1. Summary of research methods and data sources.

3.2.1. Quantitative Survey with Older Adults

The data used for the quantitative analysis were gathered from older adults (aged 60 and above) who lived in the selected neighbourhoods of Lahore. The G-Power software was mainly utilized to calculate the sample size. The significance of the G-Power program is primarily emphasized in the recent literature [76]. G-Power suggested a minimum sample size of 189 at $\alpha = 0.05$. Given the minimum recommendation for statistically significant samples, 464 older adults were contacted using a simple random sample technique in the selected neighborhoods. The participants were asked to complete a face-to-face questionnaire survey at their residence. All participants signed consent before participation. After excluding participants with incomplete consent (n = 26), invalid surveys (n = 47), and missing data (n = 72), data from 319 older adults (68.75% of the total sample) were involved in this analysis. The questionnaire comprised questions on personal socio-demographics, everyday travel, public transport service use, and preferences. The later sections asked about the perceptions of psychosocial barriers to public transport use. Thus, the three crucial psychosocial aspects, including social norms, attitude, and perceived behavioural control, were included in the questionnaire.

Data on demographic items include age, gender, marital status, family type, and living status. Moreover, socio-economic status (education, income level, and employment status) was assessed by the response options created by Turrell et al. [77]. The predominant travel mode for daily activities comprised five options, i.e., private car, motorbike, public transport, walk, and other modes. The participants were asked, "Do you use public transportation?" with a yes or no response option. The main interest was to identify if the older adults were interested in using public transportation, and if so, it was investigated which mode of public transit was preferable. Moreover, respondents were asked to inform about their travel frequency and an estimated distance to the nearest public transport stop.

The measurement scales of all selected psychosocial aspects were derived from wellrecognised literature. Social norms were measured by adapting the six-item scale, previously established by Forward [78], to explicitly calculate the perceived norms against the use of public transport. The seven-item scale adapted from [79,80] was used to reflect the older adults' attitudes toward using public transportation. Similarly, the older adults' perceived behavioural control towards public transport was assessed by the 3-item scale adapted from [81]. A five-point Likert scale assessed all these statements (1 = strongly disagree to 5 = strongly agree). The data were analyzed using descriptive statistics with the help of the SPSS Statistical Package (version 21). Moreover, the findings (including comments from open-ended questions) were summarised, which further helped to triangulate the qualitative results.

3.2.2. Semi-Structured Interviews with Older Adults

Older adults who also contributed to the questionnaire survey were requested to engage in an interview. Numerous researchers have pointed out the justifications for selecting qualitative research samples. For instance, Creswell [82] states, "I have found ... phenomenology to typically range from three to ten". Morse [83] agrees with Creswell [82], indicating that good phenomenological research requires six participants. In line with this, Morse [83] discussed the significance of recognizing data saturation while carrying out qualitative research. Thus, given the above recommendations, a total of eleven older adults were selected and interviewed. Efforts were made to include older adults with diversified backgrounds, ages, incomes, and education levels. The respondents were invited to voluntarily participate in the interview based on their convenience and schedule. The interview was scheduled with each participant upon their consent. All invited respondents were given an informed consent form before the interview. Face-to-face interviews were performed in a peaceful, distraction-free setting. Each interview took an average of 50 min.

A semi-structured interview approach with follow-up questions was utilised to elicit the core of the participants' experiences. A series of open-ended questions covered their demographic information, travel information, reflections on the social norms, attitude towards public transport services, and their control belief over the use of public transportation. The specific pattern of questioning utilised with each respondent varied based on the discussion tempo. Follow-up questioning was conducted on various occasions. It encouraged the participants to elaborate on their experiences fully and helped the researchers to capture the in-depth nature of psychosocial experiences among older adults using and accessing public transportation.

All interviews were audio-recorded and consequently transcribed. OSR NVivo 12 was employed as the primary tool to conduct the coding and analysis of qualitative data. NVivo helped the authors to highlight particular phrases, assign a code name, and develop the initial codes. These initial codes served as a foundation for thematic analysis.

3.2.3. Analysis of Policy Documents

Seven national, three provincial, and four district-level policy documents published between 1980 and 2018 were selected to understand how public transport infrastructure is discussed at various levels (Table 2). These policy documents were chosen for their significance to transportation in national and local contexts. In addition, all the documents were readily available to the public and could be accessed from official government websites.

Ν	Policy Document	Year	Reference
	National Level		
#1	Pakistan Vision 2030	2007	[84]
#2	Medium-term development framework	2005	[85]
#3	Pakistan Framework for Economic Growth	2011	[86]
#4	Pakistan Vision 2025	2013	[87]
#5	11th Five Year Plan (2013–2018)	2013	[88]
#6	12th Five Year Plan (2018–2023)	2018	[89]
#7	National Transport Policy, 2018	2018	[90]
	Provincial Level		
#8	Punjab Urban Development Project (1988–1998)	1987	[91]
#9	Provincial Urban Transport Policy (PUTP)	1998	[6]
#10	Medium-term Development Framework for Punjab	2005	[92]
	District Level		
#11	Model Urban Transport System in Lahore	1980	[93]
#12	Comprehensive Study on Transportation System in Lahore (1990–2010)	1992	[94]
#13	Integrated Master Plan for Lahore-2021	2004	[95]
#14	Lahore Urban Transport Master Plan (LUTMP) 2030	2012	[96]

Table 2. Selected policy documents analyzed.

The documents were coded thematically and examined whether they: (1) discussed public transport strategies, (2) considered older adults' travel needs, (3) emphasized psychosocial influences on public transport use, and (4) outlined any interventions to cater to the psychological barriers of mobility. The policy analysis guided the formulation of the policymaker interview schedule, which included discovering more about existing and proposed projects and barriers to an age-friendly and accessible public transportation system.

3.2.4. Expert Interviews

Four policymakers in Lahore were interviewed to understand better the psychosocial issues raised by older adults and policy concerns that emerged because of the policy analysis. A representative from each of the Punjab Masstransit Authority (PMA), Transport Planning Unit (TPU), Traffic Engineering and Planning Agency (TEPA), and Lahore Transport Company (LTC) was interviewed. These four agencies design and execute policy directives into the Lahore transportation system, both directly and indirectly, giving institutional visions. Experts were chosen for their experience and understanding in designing and overseeing Lahore's transportation system at the district and provincial levels. Participants were contacted through email and were required to sign a consent form before participation. These interviews centred on psychosocial barriers for older adults using public transport for everyday needs, challenges in forming efficient public transportation policies for older adults, the contribution of the existing policies for promoting public transport use, and overall challenges with the current public transportation system. The interviews were recorded digitally, interpreted, coded, and thematically analysed. The policymakers' interviews helped identify three themes: older adults' challenges to using public transport, problems with the existing system and developing a feasible transport policy, and the influence of transport policy in promoting older adults' mobility with public transport services.

3.2.5. A Mixed-Method Approach

This research utilizes a mixed-method approach to integrate the three techniques and various datasets into the discussion. Therefore the 'blending' of the various data sets is not pre-determined but emerges after each data set has been gathered and analysed distinctly. This strategy avoids individual methods' intrinsic flaws and limits by combining various methodologies within a single study [97]. Thus, different approaches are used to fill gaps, bring attention, envisage various perspectives, reflect various sources of information against each other, and offer a notion in broader and certain contexts [98]. It reflects a pragmatic, rational view that emphasises "what works" for a certain subject, question, or issue [99].

Using mixed-methods in this study allowed us to involve a broader range of actor groups, viewpoints, and interpretations of public transport use in the case of Lahore. None of the methodologies or data sets was preferred, and therefore no respondent groups. However, they were all deemed equally essential in aiding our knowledge about psychosocial influences on public transport use. As a result, we can better understand the range and complexity of demands and experiences and give more profound recommendations for increasing public transport usage among older adults. Thus, a combination of approaches helped provide a thorough and detailed understanding of the psychosocial barriers to using public transport and generate policy recommendations and initiatives.

4. Results

4.1. Findings from the Quantitative Survey with Older Adults

Older adults (n = 319; age 71.8 + 11.5 years; 51.8% males; 69.2% living in joint families) belonging to different neighbourhoods of Lahore completed the questionnaire survey. Descriptive statistics show that 20% of these older adults were illiterate, 39.8% had high school, and only 14% were qualified up to the post-graduate level. The income level of 35.9% respondents was below PKR 25,000 (1 PKR = 0.0058 US \$) and 31.8% had income

above PKR 50,000. Older adults' employment status outcomes indicated that 49.7% were unable to work or unemployed, while 37.7% were retired and chose not to work.

Around 60% of the older adults preferred the private mode of transport, such as motorbikes and cars, 26% used public transport, and 14% used mixed travel modes. Among public transport users, 54% preferred the metro bus, and 38% used online taxi services. Surprisingly, older adults lacked interest in other public transport modes in Lahore, such as LTC wagons and buses. Even though public transportation is available within walking distance (800 m) to most (86%) respondents, only 2% used this mode daily, 34% once or thrice per week, and 54% never or hardly ever. Overall, 69% of older adults generally travelled on public transport with their children(s) or grandchildren(s), 16% travelled with friends, 10% with other(s), and only 5% alone. Thus, it showed that some particular barriers restrict public transport use among older adults.

The present study investigated the crucial psychosocial aspects that significantly influence the mode choice among older adults. The descriptive statistics (Table 3) showed the overall disagreement with the statements provided. The average agreement scores for descriptive and injunctive norms were 2.123 and 1.512, respectively. Hence, it depicted that the peers and caretakers of older adults did not prefer public transportation for their daily activities. Most importantly, older adults received lesser acceptance from their peers to use public transit, restricting independent mobility.

Table 3. Psychosocial Barriers to public transport use as reported by older adults.

Psychosocial Factors	Mean	SD	% Agree
Social Norms			
Descriptive Social Norms			
My closest friends use public transport	2.046	1.031	40%
My family/partner use public transport	1.940	1.337	37%
My work colleagues use public transport	2.384	1.103	47%
Injunctive Social Norms			
My closest friends accept me to use public transport	1.586	1.174	31%
My family/partner accept me to use public transport	1.250	1.199	25%
My work colleagues accept me to use public transport	1.706	1.164	34%
Personal Attitude			
Experiential Attitude			
Public transport travel is good	2.142	1.082	42%
Public transport travel is useful	2.794	0.948	55%
Public transport travel is responsible	2.080	1.181	41%
Public transport travel is sensible	1.935	1.164	38%
Instrumental Attitude			
Public transport travel reduces CO2 and PM2.5 emissions	2.960	1.158	59%
Public transport travel alleviates energy shortage issues	2.653	0.815	53%
Public transport travel saves money	3.052	0.859	61%
Perceived Behavioural Control			
Easy and understandable payment method	2.470	1.022	49%
Easy to obtain public transport services	2.020	1.020	40%
Easy to access public transport services	1.467	1.125	29%
Overall, easy to use public transport services	1.751	1.142	35%

While evaluating personal attitudes, the older adults possessed greater dissatisfaction with the experiential attributes (mean = 2.237) than the instrumental attributes (mean = 2.888) of public transportation. The analysis pointed out that older adults better perceive the environmental and financial benefits of using public transportation but showed lesser satisfaction with its experiential attributes. It could be noted that regardless of the significant recognition of instrumental characteristics among older adults, the poor service quality and accessibility might exaggerate the negative attitudes towards public transportation. Thus, the absence of an efficient public transport system also lowers the perceived behavioural control among older adults, reflecting the lower agreement scores (mean = 1.927), as shown in Table 3.

4.2. Findings from the Semi-Structured Interviews with Older Adults

The qualitative insights from older adults showed the significance of psychosocial influences on public transport travel. The analysis revealed eleven sub-themes that fit into four central themes, as shown in Table 4. The poor social norms (or lack of social trend) towards using public transportation were interpreted as the profound social pressure that makes it challenging for older adults to use public transport. For example, one participant stated, " ... everyone in my community likes to travel in their personal vehicles. I observe no trend and interest towards public transport services in my surroundings". In turn, older adults did not have peer consent to use public transport or sought to avoid possible conflicts with their children or immediate family members. However, the informants reported that peers are very concerned about their ease of travel and do not recommend public transport due to specific barriers and perceived inconvenience. Thus, the negative social beliefs about public transport are primarily embedded with its service quality, resulting in limited social support for using this mode.

Theme	Sub-Theme (No. of Responses)	
	Social trend (19)	
Poor social norms	Peer rejection (29)	
1 001 social norms	Lack of social support (09)	
	Dependency (23)	
	Pleasant (17)	
Negative Emotions	Beneficial (14)	
	Sensible (10)	
	Energy efficient (07)	
Perceived benefits	Environment friendly (05)	
	Cost-effective (13)	
Inadequate behavioural control	Perceived difficulty (16)	

 Table 4. Analysis of qualitative data from semi-structured interviews with older adults.

Older adults habitually use the private mode for their everyday travel purposes. This was coupled with the prevalent socio-cultural views in Pakistan depicting the older adults' mobility as reliance on their peers. However, such dependency is a barrier for older adults, which could also be linked to poor public transport infrastructure. For instance, a female participant mentioned that the public transport accessibility constraints arise due to the increased dependence on her son. She added: "Mostly, my son accompanies me on my necessary travel. He usually takes me on his motorbike for my medical and social needs. Sometimes, when he is unavailable or not at home, I feel reluctant to travel alone. Especially accessing public bus feels difficult to me". Hence, this dependence on others is one factor that restricts public transport use among older adults.

While social normative beliefs are crucial, the interview results also described the factors that eventually shape their experiential attitude towards public transport use. The respondents revealed their overall negative emotions towards public transport services. For some, the perceived fatigue associated with public transport travel was "too pronounced." In addition, the concern of being late for essential tasks and the possibility of negative consequences discouraged respondents from taking public transportation: "service is more hectic and takes a lot of time to reach desired places." Moreover, many older adults perceive public transportation as worthless since it is unavailable nor provides services to their

desired places. The unavailability of the preferred routes forced many older adults to switch to other expensive transport modes. Likewise, most informants perceived the current public transportation as unreliable, stating that: "... usually prefer to travel in our private vehicle or online taxi and cannot trust these public transport services as these are not efficient." On the other hand, older adults consider public transport energy-efficient, environmentally friendly, and cost-effective. Regardless of the perceived advantages, older adults have a negative attitude towards public transport modes.

It was not only the unreliability of the public transport services but also the perceived difficulty in using these modes that created problems for older adults. The participants mentioned that: *"the public transport should be well organized and friendly to use. It is important to gain trust and self-belief"*. The lack of information about public transport, unfamiliarity with diverse routes, and complicated payment procedures are all factors in the limited use of public transport services among older adults. Thus, it is not unexpected that many older adults expressed their worries about choosing the appropriate public transport mode for their needs, difficulty getting the ticket, missing their desired stops, and alighting in an unfamiliar location. Hence, public transportation was recognized as the least preferred travel option when there was no alternative. This indicates that older adults use public transport services when stressed or under pressure, exacerbating their feelings of insecurity.

4.3. Policy Analysis

Among the fourteen analyzed policy documents, three mainly discussed road development and inter-regional connectivity (#2, #8, #13). Five policy documents indirectly highlighted the transport connectivity and mix of rail and road-based networks (#3, #4, #5, #6, #10). Three policy documents explicitly addressed the need for a public transport system (#7, #9, #14), while three proposed public transport strategies and plans, including mass transit systems (#11, #12, #14). However, public transportation was viewed as the least preferred mode in four policy documents (#2, #3, #5, #13).

Four documents (#4, #5, #6, and #10) highlighted the needs of marginalised populations (including older adults) and proposed some strategies within the overall social development agenda. However, none of these documents identified greater use of public transport by older adults as a desirable goal. Even the current transport policy (#7) and mass transit plan (#14) did not emphasise the accessibility issues among older adults. One document (#1) appeared as an exception, which only stressed preparing for population ageing and related issues. Yet accessible public transport was neither prioritized nor legislated for transport planning in Pakistan. Notably, the psychosocial influences associated with public transport have never been discussed or highlighted at any level.

4.4. Findings from Policy-Makers Interviews

Three themes were derived from the analysis of the policymaker interviews, including barriers to using public transport, problems with the existing system and developing a feasible transport policy, and the influence of policy in promoting public transport use. Table 5 presents the summary of the themes generated from these interviews.

Policymakers identified the pricing schemes and the expense of using public transportation as possible barriers to its utilisation. This is particularly understood in connection to—or in conflict with—other travel modes such as personal cars. Since private vehicle drivers rarely consider the capital and annual fixed expenses of the private car on an everyday basis, the cost of public transport should be compared with the daily marginal costs of driving, such as gas and parking. A TPU respondent reported: *"The cost of owning a car is rather high, yet most people do not realize it. You need to retain it on the road, with petrol, tires, and all other necessities"*.

Theme	Sub-Theme (No. of Responses)	
	Cost-effectiveness (6)	
	Safe and accessible travel (13)	
Barriers to using public transport	Providing for the marginalised groups (9)	
	Travel behaviour (6)	
	Time and convenience (8)	
	Poor collaboration (16)	
Problems with the existing system and developing a feasible transport policy	Planning documents (7)	
Trobends whit the existing system and developing a reasible dataport policy	Providing for the marginalised groups (9)	
	Lack of awareness among policymakers (11)	
The influence of policy is promoting public transport use	Innovative transport policies (5)	
The numberice of poncy in promoting public transport use	Future planning (10)	

Table 5. Themes derived from qualitative interviews with policymakers.

Maintaining good quality public transport for the marginalised groups was also seen concerning the overall transport system. For example, the initiation of the specialized pink buses aimed to promote mobility among women population groups, including older women. However, these public buses are not often used by women. Yet, the services operate separately on limited routes and timings—with different management and pricing mechanism—from other public transport services. The interview participants revealed how a lower ridership on these specialized buses has impacted, stating that "providing mobility options to the marginalized is a part of our overall agenda ... pink bus program is highly subsidized by the government but incurs significant financial losses due to poor ridership" (LTC respondent). This raises concerns regarding the suitable network for specialized transport, the public/marginalised groups mix, financing of the public network, and the complicated liaison of and perhaps less engagement of different organizations in providing such services. One respondent debated: "One of the issues you might highlight is the lack of responsibility owned by the aligned departments to address ageing challenges." [PMA official]

It was also evident from the interviews that the Lahore policy-makers do not consider age-sensitive aspects in their transport plans. The policy decisions made by the provincial and local departments do not relate to healthy ageing objectives. Still, they are broadly focusing on extending public transport routes in unserved areas. One participant mentioned: "I believe that traditionally older adults' needs have had a little impact on decision-making \dots for the majority of my professional life, we have been very focused on reducing traffic congestion, proposing road widening strategies and new public transport routes within the city" [TEPA respondent]. The similar point was raised by the official from the provincial transport department, stating how: "the link between specialized travel needs (particularly for marginalized population) and public transport is not emphasized in the recent Lahore Urban Transport Master Plan 2030. To be honest, I am not sure how we would go about incorporating it because it is a 'cover all' policy. And yes, we have a lot of disabled and older adults, so it's like having to care for two opposite ends of the spectrum simultaneously" [TPU respondent]. In addition, a PMA respondent reported: "I think that a good collaboration among transport policymakers and service providers, and their awareness towards age-sensitive parameters could help invent new possibilities for older adults' mobility."

A recent shift in travel practices and behaviour, particularly at the nexus of technological advancement, was recognized as a potential avenue for incentivising public transport travel. For example, a participant from LTC stated: *"You may not want people (particularly older adults) waiting for public transport for a longer duration at a stop as it is difficult for them and there is a perceived danger. So, using technology, it is possible to do things like 'just in time' so that people can come to a stop, see what services are available, and know where the particular* *public bus is."* This could lead to an increase in the perceived safety of public transport travel. Additionally, the real-time data on smart devices were deemed to make public transport travel more enticing by providing necessary details on the go. Moreover, a TEPA participant said, *"providing public transport information on stops and linking everything on the smartphone would obviously attract the users"*. Such vital information might eliminate anxiety, minimise waiting times by allowing users to arrive at the stop at the appropriate time, make public transport use easier, and provide a cost-effective means of payment.

Such technological advances also can improve mode integration so that public transport is no longer perceived as separate from other active modes of transportation, such as walking and cycling. A TPU participant noted: "an integrated transport is crucial for the effectiveness of a whole system. So, we are much more into the system thinking now and have recently developed an integrated transport plan for Lahore, along with PMA and TEPA . . . hoping to see positive changes in our public transport system." Even though the officials have mentioned the initiation and their focus on developing an integrated transport system, there is a need to critically look at the opportunities for older adults to reduce their alighting boarding constraints, essentially making everything more accessible and providing them more choices and options.

5. Discussion

Most research has solely focused on the infrastructural barriers and accessibility towards public transport services. However, how these constraints negatively shape psychosocial experiences remains unclear, particularly in the context of developing countries. Given the importance and emerging mobility needs of older adults in Pakistan, the presented study filled this important research gap. In this regard, this research utilised the mixed-method approach with four different datasets to investigate the unique psychosocial experiences and barriers to the use of public transport services among older adults. The critical findings are summarised below.

5.1. Psychosocial Barriers to Everyday Travel by Public Transport

Most older adults in Lahore did not use public transport for everyday purposes. This trend differs from countries such as China, where many older adults travel by public transport. However, this is not to suggest that public transport is the most preferred mode, as more than 45% of those Chinese older adults reported a preference for an active transport mode, such as walking [18]. Figure 3 summarises the critical barriers that generate negative psychosocial experiences among older adults using public transport services. The barriers are related to the features of public transport infrastructure, service quality, and socio-personal aspects.

However, a study conducted among older adults in Australia found that public transit use was strongly related to the perceived walking of five minutes or less and a distance of 400 m to a stop [100]. However, our findings suggest that the distance to the stops was not relevant and impacted public transport usage among older adults. In line with other studies [66,101], prolonged waiting times, perceived fatigue, and service unpredictability were crucial factors influencing positive attitudes and the use of public transit. However, it is worth noting that Fan and Guthrie [102] indicated that the transport riders overestimate the amount of time they spend waiting, but that the provision of facilities like benches and shelters helped to mitigate this. Thus, it shows that wait times may be inflated and emphasizes the critical role of infrastructure in addressing these problems.

The prevalent norms among peers escorting their older family members by private automobiles (such as cars) are consistent with the desire for car-based travel among older adults in Lahore [9]. The similar concern was frequently mentioned by the older adults during the questionnaire survey and interview sessions. It leads us to three vital policy concerns. First, the inefficient and unreliable public transport system generates negative emotions among its users, leading to private mode-based mobility trends among household members and society. Skarin et al. [103] emphasised how household members influenced

each other's travel and advocated focusing on the household context rather than individual travel behaviours, which is also relevant here. One crucial issue is older adults' mobility, which is determined by household resources and impacts travel distances and mode usage. Hence, the rejection and lack of support from household members ultimately restricts the use of public transportation among older adults.



Figure 3. Psychosocial barriers to using public transportation among older adults.

Secondly, the notion is that good children express their care for their older parents by taking them around to meet essential needs and ensure social functioning [22]. This is especially relevant because peers are indispensable in decision-making about older adults' travel modes [20]. Such a phenomenon particularly reduces mobility dependence among older adults. Alternatively, the advantages of using public transport for older adults' autonomy and health [33] should be recognized and placed at the heart of the discussion, coupled with explaining to older adults the environmental consequences of their travel behaviour, as has been examined in Sweden [52].

Thirdly, the interaction of socio-institutional barriers strengthens the perceived difficulty and thus lowers the control beliefs among older adults. Such a lack of perceived behavioural control towards accessing and utilising public transport services was a crucial discouraging aspect for older adults. This finding was particularly revealed from all the four datasets confirming that inadequate behavioural control among older adults was a key barrier to choosing the public transport modes in Pakistan [20]. Thus, it is evident that a multi-actor and multi-dimensional approach is required to shift attitudes and promote active and public transport use.

5.2. The Need for a Policy Shift

The analysis of the policy documents revealed that efficiency and economic growth were the considerations in the transport policies. However, the ageing aspects have largely been neglected in these policies. The negligible exceptions were in some national-level documents, in which ageing population needs were pointed out. However, there were conflicting aims regarding transport accessibility. Moreover, the policy analysis discovered several issues that need further attention.

Firstly, almost all the policy documents advocated road construction. Thus, regional connectivity only by investing in road development remained the critical focus while neglecting the importance of public transport. Secondly, regardless of the emphasis on accessibility, long-term demands, and land use transportation plans in the previous policy documents, the transport sections did not consider the mobility needs of older adults. Except for travel concessions within trains and buses for older adults [104], the plans did not refer to their unique travel needs and accessibility issues in the transportation or urban planning sections. Thirdly, the governmental interest and investment in public transport infrastructure projects have remained limited over the timeline.

Additionally, the planning and execution of several public transport projects were also given to international donor organizations and private consultants [105]. It shows the government's dependency on foreign and private consultants and their lack of interest in public transport infrastructure. Fourth, political influence has always remained a significant constraint on the practical implementation of development projects. Over time, there have been numerous instances where good urban transport plans have been discarded due to the lack of political will. Finally, there is a lack of citizens' (e.g., older adults) involvement in policymaking. Transportation is usually recognized as a technical domain where the public has no experience. Engineers, planners, and designers know much better as they are specialists in the field [106]. However, the demands of the public, particularly older adults, are largely overlooked in this consultation process. As a result, they cannot communicate their concerns or present matter on their transportation requirements.

Policymakers believe it is challenging to encourage older adults to use public transportation for their everyday travel in a country with well-established car culture. However, the interviews with policymakers also advocated a slow but positive change, with the addition of a recent mass-transit system in the Lahore public transport network, improving the user-friendliness of public transportation and recognising some of the challenges indicated by older adults. Fan and Guthrie [102] found that providing essential facilities at bus stops significantly reduces the perceived waiting time. Similarly, improving walking and service accessibility could also effectively promote public transport usage [20]. Although policymakers indicated subsidised tickets and free travel transport cards for older adults, public transport use is limited among this group. It contrasts with the case of older adults in Seoul, where the free-fare subway policy increased the number of trips and reduced private vehicle ownership [107].

Regardless, policymakers did not mention and prioritise the psychosocial influences on public transport use. Moreover, these influences have never been included in the policy agenda previously. In contrast, the barriers indicated by the older adults generate negative psychosocial influences, consequently affecting public transport usage. Hence, our findings and the policy review suggest a need for a comprehensive shift to include these essential components in transportation plans.

5.3. Practical Recommendations

Older adults in Pakistan face serious mobility constraints due to the poor accessibility of public transport services. Although existing literature widely explains the practical suggestions related to reduce public-transport infrastructure constraints, the critical psychosocial experiences remain unaddressed. Based on the Theory of Planned Behaviour, our research has shown that the psychosocial aspects are crucial for promoting public transportrelated mobility. Moreover, the results explain that poor public transport infrastructure generates negative psychosocial experiences which ultimately restrict public transport use. Hence, the study further illustrates that good social support, social trends, peer acceptance, positive emotions, and behavioural control towards public transport use positively impact mobility and independence among older adults. Therefore, we suggest a set of soft and hard transport interventions. The soft interventions that aim for internal change include: activating social norms supporting public transport behaviour, raising awareness towards public transport, providing information about the pros and cons of public transport services, and providing social support towards public transport use. On the other hand, hard transport interventions involve measures at the external level. It includes improving walking infrastructure, public transport vehicles and stops, and operations and services. Moreover, providing price incentives or subsidies and offering specialised transport services for older adults could prove helpful. Thus, age-sensitive policies directing top-down compulsory initiatives and increasing bottom-up voluntary selection of public transport modes are critical to promoting physical activity among older adults in Pakistan.

5.4. Research Limitations and Future Directions

The use of multiple datasets in this research is one of its key strengths. The comprehensive qualitative and quantitative data gives critical insights on possible public transport use from the perspectives of older adults and policymakers and the ability to integrate those new perceptions for a particular geographic setting. However, regardless of the benefits, this research has certain limitations.

Firstly, the research was only conducted in one city, limiting the generalisability of results to other cities in Pakistan or globally. That, however, is true of several other transport studies. Moreover, our findings are substantially comparable to those of other studies. Secondly, the present study comprehensively examined the characteristics of psychosocial barriers associated with public transport use only among older adults (aged 60 and above). However, the issue is equally important for other marginalised population groups. At the same time, the nature and characteristics of these psychosocial factors might vary among these population groups. Finally, given the scope and theoretical background derived for this research, this study only considered limited psychosocial factors. On the other hand, numerous psychosocial factors are identified in the existing literature. Moreover, other psychosocial aspects, such as habits, personality traits, values, emotions, worldviews, lifestyle, etc., can significantly influence public transport use among older adults.

6. Conclusions

The independent mobility of older adults is crucial for their health and social integration. Public transport and the associated walking environment could facilitate it, but the perceived constraints hinder it. Limited studies have analysed the psychosocial barriers associated with the use of public transportation among older adults, particularly in the South Asian context. The present research has adopted the mixed-method approach and revealed the critical barriers in the public transport environment generating negative psychosocial experiences among older adults. Significant barriers to older adults using public transport were related to the features of walking infrastructure, public transport service quality, and socio-personal aspects. If the aim is to encourage public transport use for older adults' everyday travel, effective strategies could involve: activating social norms, providing information and social support towards public transport use; improving walking infrastructure, vehicles, stops, and service operation; and offering subsidies and specialized transport services for older adults. These approaches will necessitate coordination across several government agencies. Given the proposed strategies, a comprehensive policy for promoting public transport use should be developed by addressing older adults' concerns and encouraging collaborations between government authorities and all relevant stakeholders.

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