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A Comparative Analysis of the Access Levels of Individuals with Disabilities to Public Services and the Influencing Factors According to Their Residence in Rural and Urban Areas

Merve Yilmaz[a], Cengiz Sayin[a*]

[a]*Akdeniz University, Faculty of Agriculture, Department of Agricultural Economics, Antalya, TÜRKIYE*

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Corresponding Author: Cengiz Sayın, E-mail: csayin@akdeniz.edu.tr
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ABSTRACT
Using Antalya province as a case study, this research investigates access to essential public services for individuals with physical, hearing, and visual impairments and the factors influencing it. Data were collected via face-to-face interviews and questionnaires from 61 individuals with physical disabilities, 60 with hearing impairments, and 60 with visual impairments. Independent samples t-tests were employed to assess geographic disparities in access, while ordinal logistic regression analysis identified predictive factors. Analysis revealed that individuals with physical and visual disabilities experienced *Limited Access* (Level 2) in both rural and urban areas. In contrast, individuals with hearing disabilities demonstrated *Full Access* (Level 1) in urban areas but *Limited Access* in rural settings. The results indicate that while place of residence (rural versus urban) did not significantly impact access for the physically disabled group, rural residence negatively affected service access for those with hearing and visual impairments. Public services should therefore be reconfigured to address specific barriers for different disability groups and to implement effective oversight to improve overall accessibility.

Keywords: Accessibility, Antalya, Individuals with disabilities, Ordinal logistic regression analysis, Public social services, Rural and urban, Turkiye

1. Introduction

Disability transcends the boundaries of a mere health condition, encompassing broader societal dimensions that extend far beyond physical impairments. Individuals with disabilities encounter substantial barriers when accessing education, culture, healthcare, employment, and social and legal services (Ay & Söylemez 2019). In response, many nations have adopted the 'Social Model,' a rights-based framework that reframes disability as a societal concern rather than a medical one. This paradigm emphasizes citizenship and social protection (Lang 2007), viewing disability as a universal human condition (Seyyar 2008) and assigning society the collective responsibility for the environmental adjustments necessary for full participation (WHO 2001). This approach mandates that governments adapt public services to foster the independent integration of individuals with disabilities (Kurt 2015).

Understanding the obstacles individuals with disabilities face is critical for informing national development strategies, particularly as these challenges are amplified in rural areas with limited-service infrastructure. Yet, rural development policy often fails to address disability access. Türkiye's 20th Development Plan (2024–2028), for instance, contains only one rural-specific target that vaguely addresses "groups requiring special policies," omitting a direct focus on disability (SBB 2023). This oversight highlights an urgent need for research situated within rural contexts to build an evidence base that can advance the rights and service access of individuals with disabilities (Nerse 2020).

Research on rural disability in Türkiye remains notably scarce, and existing studies primarily focus on identification of challenges faced by individuals with disabilities in rural settings, disability distribution among geriatric populations (Koçak et al. 2018), and the specific difficulties encountered by rural women with disabilities (Doğanay & Henden 2016; Karadağ & Eroğlu 2019; Şen 2022). Meanwhile, research on public service accessibility has concentrated overwhelmingly on urban contexts, focusing on architectural accessibility (Kuleli 2012; Berkün 2016; Tiyek et al. 2016), general evaluations of disability services (Çınarlı 2010; Tınar 2018), and assessments of local public service delivery (Kesgin 2014; Şemşit et al. 2016; Kino 2017; Yenipazarlı et al. 2020).

Internationally, rural disability research encompasses disability prevalence rates (Ipsen et al. 2022), challenges confronting youth with disabilities (Nkomo et al. 2020), social identity development (Roult et al. 2017), overall disability prevaIPSElence patterns

(Zama et al. 2013; Mahmood et al. 2015), occupational disability across geographic contexts (Franche et al. 2010), healthcare access barriers in rural settings (Iezzoni et al. 2006), livelihood-based disability approaches (Seeley 2001), and the compounded disadvantage affecting rural individuals with disabilities in accessing essential services (Gething 1997).

A critical gap exists in the literature, since no empirical investigation has undertaken a comparative analysis of public service accessibility for individuals with disabilities that simultaneously integrates three essential analytical dimensions: rural-urban geographical distinctions, typological variations across disability categories (physical, hearing, and visual impairments), and the constellation of sociodemographic and contextual factors that mediate access outcomes. The current research addresses this gap through a systematic, multi-dimensional examination of six fundamental domains of public service provision: public infrastructure and municipal services, educational institutions and learning opportunities, healthcare facilities and medical services, transportation systems and mobility infrastructure, social welfare programs and support services, and employment services and labor market integration mechanisms. Using Antalya Province as a case study, we sought to assess access levels among these distinct disability groups and identify the determinants of those outcomes. Our findings will inform evidence-based policy recommendations designed to ensure equitable public service access for all individuals with disabilities, regardless of geographic location. The study is guided by the following research questions and hypotheses:

Table 1- Research questions and hypotheses

Research Question	***Hypothesis***
RQ1. Is there a statistically significant difference in public service access levels between individuals with physical disabilities residing in rural versus urban areas?	H_0: There is no significant difference in access levels for individuals with physical disabilities between rural and urban areas. H_1: There is a significant difference in access levels for individuals with physical disabilities between rural and urban areas.
RQ2. Is there a statistically significant difference in public service access levels between individuals with hearing impairments residing in rural versus urban areas?	H_0: There is no significant difference in access levels for individuals with hearing impairments between rural and urban areas. H_1: There is a significant difference in access levels for individuals with hearing impairments between rural and urban areas.
RQ3. Is there a statistically significant difference in public service access levels between individuals with visual impairments residing in rural versus urban areas?	H_0: There is no significant difference in access levels for individuals with visual impairments between rural and urban areas. H_1: There is a significant difference in access levels for individuals with visual impairments between rural and urban areas.
RQ4. What factors influence public service access levels for individuals with physical disabilities, and does rural/urban residence have a significant effect?	H_0: Rural versus urban residence has no significant effect on the factors influencing access levels for individuals with physical disabilities. H_1: Rural versus urban residence has a significant effect on the factors influencing access levels for individuals with physical disabilities.
RQ5. What factors influence public service access levels for individuals with hearing impairments, and does rural/urban residence have a significant effect?	H_0: Rural versus urban residence has no significant effect on the factors influencing access levels for individuals with hearing impairments. H_1: Rural versus urban residence has a significant effect on the factors influencing access levels for individuals with hearing impairments.
RQ6. What factors influence public service access levels for individuals with visual impairments, and does rural/urban residence have a significant effect?	H_0: Rural versus urban residence has no significant effect on the factors influencing access levels for individuals with visual impairments. H_1: Rural versus urban residence has a significant effect on the factors influencing access levels for individuals with visual impairments.

Note: RQ = Research Question; H_0 = Null Hypothesis; H_1 = Alternative Hypothesis

2. Material and Methods

2.1. Study area

The study was conducted in the rural and urban areas of Antalya Province, home to approximately 114,000 individuals with at least one disability. This population includes an estimated 53,000 individuals with physical disabilities, 20,000 with hearing impairments, and 32,000 with visual impairments (TUIK 2011). Although national data indicate that 62.4% of individuals with disabilities reside in urban areas and 37.6% in rural settings (TUIK 2010), specific statistical data on the rural-urban distribution for this population within Antalya Province are unavailable.

2.2. Data sources

The principal research material consisted of primary data obtained through face-to-face interviews with accessible individuals aged 15 and over with physical, hearing, or visual impairments. Participants were drawn from both rural and urban areas of Antalya, and data were collected via structured questionnaires administered directly to them. The primary dependent variable, service access, was measured using a Likert-type scale within these questionnaires. Such primary data was supplemented by secondary sources, including dissertations, governmental reports, legal frameworks, and scholarly literature relevant to disability and public service accessibility.

2.3. Sampling design and data collection

Given that only the total population size was known, sample size determination followed the framework developed by Yazıcıoğlu & Erdoğan (2004), which specifies appropriate sample sizes for social research based on predetermined margins of error. A 10% margin of error was adopted, consistent with conventions in social science research. Population homogeneity with respect to key variables justified setting the probability of occurrence (p) at 0.8 and non-occurrence (q) at 0.2. These parameters yielded a minimum required sample of 61 participants per disability category, producing a total target sample of 183 individuals across the three disability groups (Table 2).

Table 2- Estimated sample size for studies with a known population size

Population Size	*Sampling Error (d = .03)*			*Sampling Error (d = .05)*			*Sampling Error (d = .10)*		
	p=0.5 q=0.5	p=0.8 q=0.2	p=0.3 q=0.7	p=0.5 q=0.5	p=0.8 q=0.2	p=0.3 q=0.7	p=0.5 q=0.5	p=0.8 q=0.2	p=0.3 q=0.7
100,000	1056	678	888	383	245	322	96 →	61	81

Note. The t-value used for calculations was 1.96. The formula used is: $n = N \cdot t^2 \cdot p \cdot q / [d^2 \cdot (N-1) + t^2 \cdot p \cdot q]$. From Yazıcıoğlu & Erdoğan (2004)

The paucity of published statistical data on the spatial distribution of individuals with disabilities within Antalya Province precluded the use of a standard sampling frame. Accordingly, the snowball (chain) sampling method was employed to locate and recruit participants. Dedicated questionnaire instruments were developed for each disability group, structured around six principal public service domains: public works, education, health, transportation, social services, and employment. Subdimensions within each service category were tailored to the specific accessibility challenges associated with physical, hearing, and visual disabilities.

The sampling strategy aimed for equal representation from rural and urban contexts, targeting half of each disability group's sample from each geographic setting to enable robust statistical comparisons. However, participant recruitment proved substantially more challenging in rural areas. Dispersed settlement patterns and the low population density of individuals with disabilities in rural regions significantly complicated outreach efforts, with some remote locations yielding only one participant per day. These geographic constraints—combined with additional barriers including survey skepticism, participation reluctance, and communication difficulties inherent to specific disabilities—constrained data collection efficiency.

Communication barriers proved particularly acute when engaging individuals with hearing impairments, posing a significant methodological hurdle to data collection. Successful data collection from this group was entirely contingent upon specialized mediation to ensure accurate comprehension and expression. This necessitated close collaboration with certified sign language interpreters or, in many cases, family members fluent in sign language, such as Children of Deaf Adults (CODA). Despite these methodological challenges, 181 questionnaires were completed, nearly meeting the target sample of 183. The final distribution of completed questionnaires by disability type and geographic location is detailed in Table 3.

Table 3- Distribution of completed questionnaires by district, disability group, and residence

District	*Physically Disabled*		*Hearing Impaired*		*Visually impaired*	
	Rural	*Urban*	*Rural*	*Urban*	*Rural*	*Urban*
Kepez	9	20	6	15	6	9
Konyaaltı	3	5	3	9	7	5
Muratpaşa	—	6	—	5	—	11
Aksu	5	—	4	—	3	1
Alanya	2	—	4	—	3	—
Elmalı	5	—	2	—	3	—
Manavgat	5	—	3	—	4	—
Serik	1	—	1	—	3	—
Döşemealtı	—	—	3	1	—	2
Finike	—	—	1	—	—	2
Korkuteli	—	—	2	—	1	—
Kumluca	—	—	1	—	—	
Total	30	31	30	30	30	30

Note: Total N = 181. Em dashes (—) indicate that no participants were sampled from that category

2.4. Data analysis method

The data analysis strategy was determined by the study's objectives and hypotheses. The research employed two primary statistical methods: independent samples t-tests to compare mean access scores (addressing RQ1, RQ2, and RQ3), and ordinal logistic regression analysis to identify the factors influencing those access levels (addressing RQ4, RQ5, and RQ6). The specific application of these methods is detailed in Table 4.

Table 4- Research objectives and analysis methods

Topics & Objectives	*Analysis Method*	*Data Source*	*RQ/H*
Determining the level of access to public services	Independent Samples t-test	Survey data from individuals with hearing, visual, and physical disabilities in rural and urban areas	RQ1 (H_0/H_1), RQ2 (H_0/H_1), RQ3 (H_0/H_1)
Identifying the factors affecting the level of access to public services	Ordinal Logistic Regression Analysis	Survey data from individuals with hearing, visual, and physical disabilities in rural and urban areas	RQ4 (H_0/H_1), RQ5 (H_0/H_1), RQ6 (H_0/H_1)

Note: RQ = Research Question; H = Hypothesis

2.4.1. Dependent variable: Access level and scoring

The measurement of access levels evolved through an iterative process informed by both the literature review and preliminary participant interviews. Initially, access was operationalized as a binary variable with two categories: *Able to Access* and *Unable to Access*. However, early data collection revealed substantial heterogeneity within the *Unable to Access* category, necessitating a more nuanced measurement approach. Consequently, the scale was refined to capture three distinct levels of access: (1) *Full Access*, (2) *Limited Access*, and (3) *No Access*. This ordinal classification system provided greater sensitivity to variation in service accessibility experiences. The numerical scoring system assigned the following ranges: *Full Access* (1.00–2.00 points), *Limited Access* (2.01–2.50 points), and *No Access* (2.51–3.00 points), as illustrated in Figure 1. The weighted mean scale value (WMSV) was calculated to summarize response patterns across the sample via the formula:

$$WMSV = \frac{[(F*S1)+(F*S2)+(F*S3)]}{n} \quad (1)$$

Where: F represents the frequency of responses at each scale rating S, and n denotes the total sample size.

In order to assess geographic disparities in access, an independent samples t-test was employed to compare WMSV scores between participants residing in urban versus rural areas. The parametric test was chosen to see whether mean access levels differed significantly as a function of residential location, with statistical significance evaluated at $\alpha = .05$.

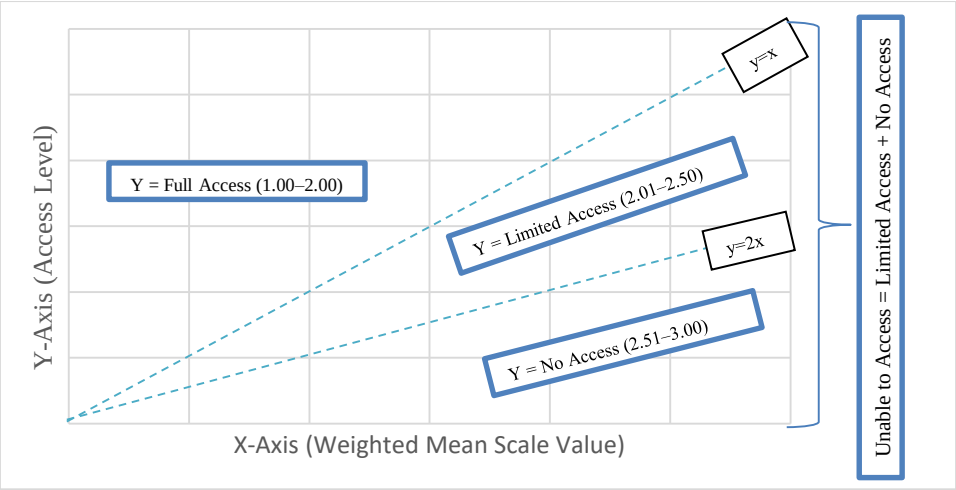

Figure 1- Levels of access to public services

2.4.2. Ordinal logistic regression modeling

Logistic regression represents a widely employed analytical technique for examining relationships between variables when the dependent variable is categorical (Akın & Şentürk 2012). Three variants exist based on the dependent variable's structure: binary, multinomial, and ordinal logistic regression. When the dependent variable contains more than two ordered categories, ordinal logistic regression is the appropriate method (Yavuz et al. 2014).

We employed the ordinal logistic regression framework developed by McCullagh (1980), which posits that an unobserved continuous latent variable underlies the observed ordered categorical responses. Given that the dependent variable comprised three hierarchically ordered access levels, ordinal logistic regression was deemed most suitable for addressing the research questions. The model specification utilized the logit link function (McCullagh 1980):

$$link\ (\gamma j) = \frac{\tau j\ -\ (\beta 0 +\ \ldots +\ \beta k\ xk)}{\exp(\theta 0 + \cdots +\ \theta 1 z 1)} \qquad (2)$$

In the above-given formula, γj represents the cumulative probability for category j, τj denotes the threshold value for category j, β_0 through β_k are regression coefficients β and θ constitute vectors of unknown location and scale parameters, and z_1 represents the explanatory variable for scale parameters.

The dependent variable (Y) represented the level of public service access, classified into three ordered categories (as shown in Figure 1). Separate ordinal logistic regression models were constructed for the physically disabled, hearing impaired, and visually impaired groups.

A critical aspect of the analytical strategy was the theoretically-driven and context-specific selection of independent variables for each model. While a core set of demographic predictors (e.g., age, occupation, place of residence, educational level) was considered for all groups, the final models were tailored to reflect the distinct barriers and mediating factors characteristic of each disability. Such an approach was adopted because a single, uniform model would fail to capture the unique sociocultural and environmental realities influencing access for each group.

In particular, the model for individuals with hearing impairments included a broader array of social and informational variables, such as NGO membership, Gender, Companion, and Knowledge of disability rights. This decision was based on the premise that access for this group is heavily mediated by distinct communication channels, community networks (often centered around Deaf culture), and the availability of interpreters or companions. These factors were hypothesized to be less directly influential for individuals with physical disabilities, whose primary barriers relate to the built environment, or for individuals with visual impairments, where technological aids may play a more central role. Following preliminary analysis, variables were systematically included or excluded from each group's final model to ensure parsimony and to retain only the most salient predictors, thus enhancing the explanatory power and relevance of each model. Across all models, the place of residence variable (1 = rural area, 2 = urban area) served as the primary determinant for analyzing rural-urban access disparities. Reference categories were automatically designated by the SPSS software package.

The model's validity rests on the proportional odds assumption (i.e., that the relationship between predictors and the outcome is consistent across all levels of the dependent variable). This assumption was verified through the test of parallel lines.

Model adequacy (i.e., model fit) was assessed via Pseudo-R^2 statistics (Cox & Snell R^2 and Nagelkerke R^2) to quantify the variance explained. A goodness-of-fit test was also performed in an effort to compare the full model (with all independent variables) against an intercept-only model to confirm that the predictors collectively improved model performance.

Finally, we calculated odds ratios (ORs) with 95% confidence intervals for all statistically significant predictors. The effect size estimation via ORs serves as a measure of effect size, quantifying the strength and direction of the relationship between each predictor variable and the outcome. ORs indicate how much more or less likely an individual is to experience a different level of access for each unit change in the predictor, while controlling for the influence of all other variables in the model.

Table 5- Description of variables used in the ordinal logistic regression models

Variable	*Type*	*Description and Categories*
Dependent Variable		
Access Level	Ordinal	1. *Full Access* (Score 1.00–2.00) 2. *Limited Access* (Score 2.01–2.50) 3. *No Access* (Score 2.51–3.00)
Independent Variables: Physical Disabilities Model		
Age	Continuous	Age in years
Occupation	Categorical	1. Public sector employee, 2. Private sector employee, 3. Tradesperson, 4. Farmer, 5. Worker, 6. Retired, 7. Not working/unemployed, 8. Student, 9. Temporary job
Place of Residence*	Categorical	1. Rural area, 2. Urban area
Disability Rate	Categorical	1. 40%, 2. 41%–60%, 3. 61%–80%, 4. 81%–100%
Education	Categorical	1. Not literate, 2. Literate, 3. Primary Education, 4. High School, 5. University Student, 6. Graduate, 7. Postgraduate student, 8. Postgraduate Degree (Master's/PhD)
Cause of Disability	Categorical	1. Illness, 2. Accident, 3. Congenital, 4. Other
Independent Variables: Hearing Impairment Model		
Age	Continuous	Age in years
Household Size	Continuous	Number of people in household
Disability Rate	Categorical	1. 40%, 2. 41%–60%, 3. 61%–80%, 4. 81%–100%
Cause of Disability	Categorical	1. Illness, 2. Accident, 3. Congenital
Duration of Disability	Categorical	1. 1–10 years, 2. 11–20 years, 3. 21–30 years, 4. 31+ years
Place of Residence*	Categorical	1. Rural area, 2. Urban area
Marital Status	Categorical	1. Married, 2. Single, 3. Widowed
NGO Membership	Categorical	1. Not a member, 2. Member
Length of Residence	Categorical	1. 1–5 years, 2. 6–10 years, 3. 11–15 years, 4. 16+ years
Gender	Categorical	1. Female, 2. Male
Presence of Companion	Categorical	1. No companion, 2. Has a companion
Knowledge of Disability Rights	Categorical	1. No knowledge, 2. Has knowledge
Occupation	Categorical	1. Public sector employee, 2. Private sector employee, 3. Tradesperson, 4. Farmer, 5. Worker, 6. Retired, 7. Unemployed, 8. Student
Health Insurance	Categorical	1. Social Security Institution (SGK), 2. Bağ-Kur (Social Security for Artisans and the Self-Employed), 3. Pension Fund, 4. Health Card for People with No Social Security
Independent Variables: Visual Impairment Model		
Age	Continuous	Age in years
Income	Continuous	Monthly income
Place of Residence*	Categorical	1. Rural area, 2. Urban area
Education	Categorical	1. Not literate, 2. Literate, 3. Primary Education, 4. High School, 5. University Student, 6. Graduate, 7. Postgraduate student, 8. Postgraduate Degree (Master's/PhD)
Gender	Categorical	1. Female, 2. Male
Marital Status	Categorical	1. Married, 2. Single, 3. Widowed
Disability Rate	Categorical	1. 40%, 2. 41%–60%, 3. 61%–80%, 4. 81%–100%
Duration of Disability	Categorical	1. 1–10 years, 2. 11–20 years, 3. 21–30 years, 4. 31+ years
Assistive Device	Categorical	1. Not using, 2. Using

*Note: *This variable is a determinant of the rural-urban distinction in terms of access*

3. Results and Discussion

3.1. Socioeconomic and demographic characteristics

The gender distribution of participants was comparable across rural and urban settings. However, significant disparities emerged in educational attainment: individuals in rural areas demonstrated substantially lower rates of high school completion and

postsecondary enrollment than their urban counterparts (Table 6). This aligns with existing research indicating that rural residents with disabilities encounter greater structural barriers to education (Nerse 2020).

Despite Türkiye's legal framework mandating disability employment quotas (3% in the private sector, 4% in the public sector; Official Gazette 2003), unemployment rates were markedly high in the sample (Table 6). This finding corroborates broader evidence of reduced educational and employment opportunities for individuals with disabilities, a problem that is particularly acute in rural areas (Ipsen et al. 2022a).

Table 6- Socioeconomic and demographic findings by disability group and residence

Characteristic	*Physically Disabled*		*Hearing Impaired*		*Visually Impaired*	
	Urban (*n*= 31)	*Rural* (*n*= 30)	*Urban* (*n*= 30)	*Rural* (*n*= 30)	*Urban* (*n*= 30)	*Rural* (*n*= 30)
Gender						
Female	15 (48.4)	13 (43.3)	14 (46.7)	15 (50.0)	11 (36.7)	12 (40.0)
Male	16 (51.6)	17 (56.7)	16 (53.3)	15 (50.0)	19 (63.3)	18 (60.0)
Marital Status						
Married	15 (48.4)	12 (40.0)	15 (50.0)	9 (30.0)	11 (36.7)	15 (50.0)
Single	13 (41.9)	13 (43.3)	12 (40.0)	16 (53.3)	18 (60.0)	10 (33.3)
Widowed	3 (9.7)	5 (16.7)	3 (10.0)	5 (16.7)	1 (3.3)	5 (16.7)
Education						
Not literate	1 (3.2)	2 (6.7)	-	2 (6.7)	2 (6.7)	1 (3.3)
Literate	2 (6.5)	2 (6.7)	3 (10.0)	3 (10.0)	-	3 (10.0)
Primary School	8 (25.8)	11 (36.7)	9 (30.0)	11 (36.7)	4 (13.3)	14 (46.7)
High School	15 (48.4)	7 (23.3)	9 (30.0)	10 (33.3)	14 (46.7)	8 (26.7)
University Student	2 (6.5)	4 (13.3)	6 (20.0)	4 (13.3)	6 (20.0)	2 (6.7)
Graduate	3 (9.7)	4 (13.3)	3 (10.0)	-	3 (10.0)	2 (6.7)
Master's/PhD	-	-	-	-	1 (3.3)	-
Health Insurance						
Health Card	15 (48.4)	11 (36.7)	14 (46.7)	10 (33.3)	10 (33.3)	9 (30.0)
SGK	11 (35.5)	5 (16.7)	8 (26.7)	10 (33.3)	8 (26.7)	9 (30.0)
Bağ-Kur	4 (12.9)	7 (23.3)	2 (6.7)	5 (16.7)	5 (16.7)	9 (30.0)
Pension Fund	1 (3.2)	6 (20.0)	6 (20.0)	5 (16.7)	7 (23.3)	3 (10.0)
Other	-	1 (3.3)	-	-	-	-
Occupation						
Unemployed	18 (58.1)	13 (44.8)	14 (46.7)	15 (50.0)	9 (30.0)	17 (60.7)
Retired	6 (19.4)	2 (6.9)	2 (6.7)	2 (6.7)	3 (10.0)	3 (10.7)
Farmer	-	2 (6.9)	-	1 (3.3)	1 (3.3)	2 (7.1)
Private sector	-	2 (6.9)	3 (10.0)	4 (13.3)	1 (3.3)	-
Public sector	2 (6.5)	4 (13.8)	4 (13.3)	2 (6.7)	6 (20.0)	3 (10.7)
Tradesperson	2 (6.5)	1 (3.4)	1 (3.3)	-	1 (3.3)	-
Student	2 (6.5)	5 (17.2)	6 (20.0)	6 (20.0)	8 (26.7)	3 (10.7)
Other	1 (3.2)	-	-	-	1 (3.3)	-
Continuous Variables	*M*	*M*	*M*	*M*	*M*	*M*
Age (years)	40.1	37.77	37.7	43.1	36.5	44
Household size	3.19	3.93	3.8	3.17	3.7	4.2
Monthly income (TRY)	11 116	13 713	12 260	11 163	15 696	14 140

Note. Categorical variables are presented as frequency (f) and percentage (%). Continuous variables are presented as the mean (M). The total n for each group is 31 (Physically Disabled - Urban) or 30 (all other groups). SGK = Social Security Institution; Bağ-Kur = Social Security for Artisans and the Self-Employed

3.2. Access to public services and geographic disparities (RQ1–RQ3)

Among urban residents, individuals with physical disabilities demonstrated the lowest overall access to public services, whereas those with hearing impairments reported the highest. In rural areas, individuals with visual impairments faced the most significant barriers (Table 7).

Table 7- Mean access scores for basic public services by disability group and residence

Public Service Category	*Physically Disabled*		*Hearing Impaired*		*Visually Impaired*	
	Urban	*Rural*	*Urban*	*Rural*	*Urban*	*Rural*
Public works services	2.03	2.01	1.91	2.19	2.15	2.41
Educational services	2.34	2.02	1.73	2.29	2.16	2.30
Healthcare services	1.85	1.87	2.14	2.02	2	2.14
Transportation services	2.28	2.34	1.98	2.22	2	2.45
Social public services	2.32	2.42	2.2	2.07	2.31	2.57
Employment services	1.81	2.13	2.06	2.19	1.97	2.45
Overall Mean Access Score	2.11	2.13	2.00	2.16	2.08	2.39

Note. Scores represent the Weighted Mean Scale Value (WMSV). Access levels are defined as: 1.00–2.00 = Full Access; 2.01–2.50 = Limited Access; 2.51–3.00 = No Access

In an attempt to examine geographic disparities in service accessibility, independent samples t-tests compared mean access scores between urban and rural residents within each disability group (see Table 8 for full hypothesis test results). The analysis revealed significant heterogeneity in the rural-urban divide across disability types. For individuals with physical disabilities (RQ1), the comparison between urban (M = 2.11) and rural (M = 2.13) residents was not statistically significant (p = .147). This supports H_0, indicating that both groups experience a comparable *Limited Access* level, which suggests that the barriers for this population—likely related to fundamental architectural and transportation deficits—are pervasive and transcend geographic boundaries, aligning with national research showing that public institutions frequently fail to meet established accessibility standards, irrespective of location (Berkün 2016).

In contrast, a statistically significant disparity emerged for individuals with hearing impairments (RQ2) (p = .036), thus supporting H_1. While urban residents (M = 2.00) achieved scores consistent with *Full Access*, rural residents (M = 2.16) fell into the *Limited Access* category. This suggests the concentration of specialized communication resources, such as sign language interpretation services, in urban centers creates a substantive geographic gradient in accessibility.

The most pronounced inequality was found among individuals with visual impairments (RQ3) (P< .001), strongly supporting H_1. Rural residents (M = 2.39) reported access scores approaching the *No Access* threshold, a severe disadvantage compared to their urban counterparts (M = 2.08). Such acute vulnerability likely stems from the compound effects of limited transportation (Bezyak et al. 2017), lack of orientation and mobility specialists, and restricted access to assistive technologies, often concentrated in urban centers (Zama et al. 2013). Our findings substantiate international research identifying that disability disproportionately impedes service access in rural communities. The challenges identified in Antalya—particularly regarding specialized services and transportation—parallel the barriers documented in rural areas of the USA (Iezzoni et al. 2006) and Austria (Gething 1997).

Table 8- Summary of findings and hypothesis tests for research questions 1–3

Research Question	*Disability Group*	*Finding*	*Hypothesis Test Result*
RQ1	Physically disabled	Individuals residing in rural and urban areas are equally disadvantaged in accessing public services.	H_0: Individuals with physical disabilities living in rural areas have the same level of access to public services as those living in urban areas. *(Accepted)*
RQ2	Hearing impaired	Individuals living in rural areas are more disadvantaged in accessing public services compared to those living in urban areas.	H_1: Individuals with hearing impairments living in rural areas do not have the same level of access to public services as those living in urban areas. *(Accepted)*
RQ3	Visually impaired	Individuals living in rural areas are more disadvantaged in accessing public services compared to those living in urban areas.	H_1: Individuals with visual impairments living in rural areas do not have the same level of access to public services as those living in urban areas. *(Accepted)*

3.3. Regression analysis: factors affecting access to public services (RQ4–RQ6)

To identify the specific factors influencing service access, ordinal logistic regression analysis was conducted separately for each disability group. A prerequisite for this method is the proportional odds (parallel lines) assumption, which requires the predictor-outcome relationship to be consistent across categories (P> .05) (Liang et al. 2020). This assumption was validated for all three models: the physical disability model (p = .162), the hearing impairment model (p = 1.00), and the visual impairment model (p = 1.00) (Table 9). With this assumption satisfied, the analysis proceeded to evaluate model fit.

Table 9- Results of the test of parallel lines assumption

Model	*Physically Disabled*		*Hearing Impaired*		*Visually Impaired*	
	-2LL	*p*	*-2LL*	*p*	*-2LL*	*p*
Null Model	26.108		47.916		52.188	
Overall	.000	.162	42.920	1.000	48.684	1.000

Note. LL stands for Log-Likelihood. A p-value greater than .05 (as seen in all three models) indicates that the assumption is met

Pseudo-R^2 statistics were calculated to quantify the strength of the relationship between the independent variables and the outcome. As shown in Table 10, the Cox & Snell R^2 and Nagelkerke R^2 values for all three models were well above the .20 threshold suggested by Terzi (2019), indicating adequate model fit.

Table 10- Pseudo R^2 statistics for the ordinal logistic regression models

Model	*Cox & Snell R^2*	*Nagelkerke R^2*	*McFadden R^2*
Physically Disabled	.417	.667	.549
Hearing Impaired	.634	.755	.549
Visually Impaired	.558	.685	.484

Note: The table presents pseudo-R^2 values as measures of model fit

Additionally, we conducted a goodness-of-fit test to determine if the full models (with predictors) provided a statistically significant improvement over the baseline intercept-only models. The results in Table 11 confirm this for all three groups: the models for individuals with physical disabilities (P = .045), hearing impairments (P = .001), and visual impairments (P< .001) were all statistically significant. This indicates that the independent variables in each model collectively have a significant relationship with the access level.

Table 11- Goodness-of-fit statistics for ordinal logistic regression models

Model	*Baseline −2LL*	*Final −2LL*	*Likelihood Ratio χ2*	*p*
Physically Disabled	57.922	26.108	31.814	.045
Hearing Impaired	106.171	47.916	58.256	.001
Visually Impaired	101.207	52.188	49.019	< .001

*Note: LL stands for Log-Likelihood. The Likelihood Ratio Test compares the fit of the final model (with predictors) to the baseline (intercept-only) model. A significant p-value (*P< *.05) indicates that the final model provides a statistically significant improvement in fit.*

3.3.1. Model results: physically disabled group (RQ4)

Table 12 presents the results of the ordinal logistic regression model constructed to identify and quantify the specific factors that significantly influence access to public services among individuals with physical disabilities.

Table 12- Results of the ordinal logistic regression model for the physically disabled group (N = 61)

Variable	*β*	*SE*	*Wald χ2*	*df*	*p*	*95% CI for β*	*OR*
Thresholds							
[Access Level = 1] (Full)	-33.687	7.148	22.21	1	< .001	[-47.697, -19.677]	
[Access Level = 2] (Limited)	-23.327	7.234	10.398	1	.001	[-37.506, -9.148]	
Predictor Variables							
ge	-.128	.086	2.236	1	.135	[-.297, .040]	.879
Occupation							
Public sector	-29.246	4.51	42.046	1	< .001	[-38.086, -20.406]	1.999
Private sector	-27.484	7.671	12.838	1	< .001	[-42.519, -12.450]	1.166
Tradesperson	-29.914	4.378	46.693	1	< .001	[-38.494, -21.334]	1.022
Farmer	-29.447	4.221	48.677	1	< .001	[-37.719, -21.175]	1.633
Retired	-32.726	4.135	62.651	1	< .001	[-40.830, -24.623]	6.133
Unemployed	-29.569	3.145	88.398	1	< .001	[-35.732, -23.405]	1.444
Student	-30.308	.000		1		[-30.308, -30.308]	6.888
Temporary job (Reference)	0[a]	—	—	0	—	—	—
Place of residence							
Rural area*	-1.267	1.655	.586	1	.444	[-4.510, 1.976]	.281
Urban area (Reference)	0[a]	—	—	0	—	—	—
Disability rate							
40%	1.465	9.98	.022	1	.883	[-18.095, 21.026]	4.328
41%–60%	-2.008	2.163	.862	1	.353	[-6.247, 2.231]	.134
61%–80%	1.351	2.292	.348	1	.555	[-3.141, 5.843]	3.862
81%–100% (Reference)	—	—	—	0	—	—	—
Education							
Not literate	5.122	4.272	1.437	1	.231	[-3.251, 13.496]	167.7
Literate	5.939	5.711	1.081	1	.298	[-5.254, 17.132]	379.518
Primary School	4.658	3.331	1.956	1	.162	[-1.870, 11.186]	105.454
High School	2.249	2.904	0.6	1	.439	[-3.442, 7.941]	9.482
University student	-.153	3.267	.002	1	.963	[-6.557, 6.251]	.858
Graduate (Reference)	0[a]	—	—	0	—	—	—
Cause of disability							
Illness	5.669	5.73	.979	1	.323	[-5.562, 16.900]	289.69
Accident	8.806	6.036	2.128	1	.145	[-3.025, 20.637]	6674.332
Congenital	2.679	5.372	.249	1	.618	[-7.849, 13.208]	14.577
Other (Reference)	0[a]	—	—	0	—	—	—

*Note. β = beta coefficient; SE = Standard Error; CI = Confidence Interval; OR = Odds Ratio. Reference categories are denoted with an em-dash (—). *This variable determines rural-urban disparities in access. [a]Statistics (Wald, p) are undefined due to quasi-complete separation for this category.*

As the model results in Table 12 show, occupational status was the only variable to significantly predict public service access for individuals with physical disabilities. The statistical analysis automatically designated 'temporary employment' as the reference category, against which all other occupational groups were compared. Compared to this reference, individuals in all other measured occupational categories had a reduced likelihood of reporting *No Access* (P< .05). The most pronounced protective effect was observed among retired individuals (OR = 6.133), who were over six times less likely to report *No Access*. Other occupations also showed a significant positive effect: public sector workers (OR = 1.999), farmers (OR = 1.633), private sector workers (OR = 1.166), and tradespersons (OR = 1.022).

The finding for unemployed individuals (OR = 1.444) is particularly noteworthy. Survey data revealed that these participants were predominantly recipients of disability pensions. This suggests their reduced likelihood of reporting *No Access* is likely a function of their necessary and enhanced engagement with public social service systems to manage their benefits, rather than an indicator of broad systemic accessibility.

Regarding RQ4, the place of residence variable was not statistically significant (p = .444), with urban residence as the reference category. This confirms that residing in a rural versus urban area does not have a significant effect on service access for this group. The null hypothesis (H_0) is therefore accepted. This reinforces the finding from the t-test that the barriers for individuals with physical disabilities—likely related to fundamental architectural and transportation deficits—are pervasive and not geographically dependent.

3.3.2. Model results: hearing impaired group (RQ5)

The results of the model established to identify the factors affecting access to public services for individuals with hearing impairments are presented in Table 13.

Table 13- Results of the ordinal logistic regression model for the hearing-impaired group (N = 60)

Variable	*β*	*SE*	Wald $\chi 2$	*df*	*p*	95% CI for *β*	*OR*
Thresholds							
[Access Level = 1] (Full)	11.172	5.569	4.024	1	.045	[.257, 22.087]	
[Access Level = 2] (Limited)	21.253	7.895	7.246	1	.007	[5.778, 36.727]	
Predictor Variables							
Age	.459	.155	8.809	1	.003	[.156, .762]	1.582
Household Size	.663	.594	1.248	1	.264	[-.501, 1.827]	1.941
Disability Rate							
41%–60%	-5.529	2.661	4.316	1	.038	[-10.745, -.031]	.004
61%–80%	-4.645	2.265	4.205	1	.040	[-9.085, -.205]	.009
81%–100% (Reference)	0[a]	—	—	0	—	—	—
Cause of Disability							
Illness	-4.104	2.233	3.378	1	.066	[-8.479, .272]	.017
Accident	-2.052	2.642	.603	1	.437	[-7.230, 3.125]	.128
Congenital (Reference)	0[a]	—	—	0	—	—	—
Duration of Disability							
1–10 years	5.818	3.302	3.105	1	.078	[-.654, 12.289]	336.198
11–20 years	3.362	2.294	2.147	1	.143	[-1.134, 7.858]	28.835
21–30 years	4.565	2.358	3.747	1	.053	[-.057, 9.187]	96.034
31+ years (Reference)	0[a]	—	—	0	—	—	—
Place of residence*							
Rural area	4.183	1.925	4.722	1	.030	[.410, 7.955]	65.536
Urban area (Reference)	0[a]	—	—	0	—	—	—
Marital Status							
Married	-2.617	1.888	1.921	1	.166	[-6.317, 1.084]	.073
Single	1.079	1.945	.308	1	.579	[-2.732, 4.891]	2.942
Widowed (Reference)	0[a]	—	—	0	—	—	—
NGO Membership							
Not a member	-4.102	2.041	4.038	1	.044	[-8.104, -.101]	.017
Member (Reference)	0[a]	—	—	0	—	—	—
Length of Residence							
1–5 years	-16.64	.000		1		[-16.640, -16.640]	5.935
6–10 years	.649	1.697	.146	1	.702	[-2.677, 3.975]	1.914
11–15 years	5.621	2.213	6.456	1	.011	[1.285, 9.958]	276.303
16+ years (Reference)	0[a]	—	—	0	—	—	—
Gender							
Female	-1.911	1.319	2.098	1	.147	[-4.497, .675]	.148
Male (Reference)	0[a]	—	—	0	—	—	—
Presence of Companion							
No companion	-.776	1.473	.278	1	.598	[-3.662, 2.110]	.46
Has a companion (Reference)	0[a]	—	—	0	—	—	—
Knowledge of Disability Rights							
No knowledge	-.769	1.474	.272	1	.602	[-3.659, 2.121]	.463
Has knowledge (Reference)	0[a]	—	—	0	—	—	—
Occupation							
Public sector	-4.78	2.551	3.511	1	.061	[-9.779, .220]	.008
Private sector	2.66	3.01	.781	1	.377	[-3.239, 8.560]	14.303
Tradesperson	-1.835	9.244	.039	1	.843	[-19.952, 16.282]	.159
Farmer	-34.1	.000		1		[-34.100, -34.100]	1.550
Retired	-11.596	4.632	6.266	1	.012	[-20.675, -2.516]	9.207
Unemployed	-1.696	2.305	.542	1	.462	[-6.213, 2.820]	.183
Student (Reference)	0[a]	—	—	0	—	—	—
Health Insurance							
SGK	1.81	1.754	1.066	1	.302	[-1.627, 5.247]	6.112
Bağ-Kur	.758	2.392	0.1	1	.751	[-3.931, 5.446]	2.133
Pension Fund	1.044	2.141	.238	1	.626	[-3.151, 5.240]	2.842
Health Card (Reference)	0[a]	—	—	0	—	—	—

*Note. β = beta coefficient; SE = Standard Error; CI = Confidence Interval; OR = Odds Ratio. SGK = Social Security Institution; Bağ-Kur = Social Security for Artisans and the Self-Employed. Reference categories are denoted with an em-dash (—). *This variable determines rural-urban disparities in access.*
[a]Statistics (Wald, p) are undefined due to quasi-complete separation for this category

The ordinal logistic regression analysis for individuals with hearing impairments, presented in Table 13, identified several significant predictors of public service access, including age, disability rate, place of residence, NGO membership, length of residence, and occupation. These variables collectively shaped distinct patterns of service accessibility within this population.

Age emerged as a significant risk factor (P = .003). Each incremental year was associated with 1.58 times higher odds (OR = 1.582) of experiencing *No Access* to public services. This finding suggests that older individuals with hearing impairments face progressively greater barriers to service utilization, indicating that services are poorly adapted for the elderly with hearing loss.

Disability severity demonstrated a notable protective gradient. Compared to individuals with the most severe hearing impairments (81%–100% disability rate), those with moderate impairments (41%–60%) showed substantially lower odds (OR = .004, P< .05) of complete service inaccessibility. Those with moderately-severe impairments (61%–80%) exhibited similarly reduced odds (OR = .009, P< .05). This pattern clearly indicates that individuals with the highest disability rates experience disproportionately limited access to public services.

Geographical location proved to be a critical determinant of service access (P = .030). Individuals residing in rural areas faced dramatically elevated odds—65.5 times higher (OR = 65.536)—of experiencing *No Access* compared to their urban counterparts. This pronounced rural-urban disparity highlights substantial geographical inequities and provides strong support for the alternative hypothesis (H_1), confirming that residing in rural versus urban areas exerts a significant effect on service access for this population.

Civic engagement, as measured by NGO membership, also influenced access patterns, though in an unexpected direction (P = .044). Individuals not affiliated with disability-related NGOs demonstrated significantly lower odds (OR = .017) of complete service inaccessibility compared to NGO members. This counterintuitive finding likely reflects a selection effect, whereby individuals experiencing greater service barriers are more motivated to seek NGO support and advocacy.

Length of residence in Antalya revealed temporal dynamics in service access. Individuals residing in the region for 11–15 years exhibited substantially higher odds (OR = 276.30, P = .011) of *No Access* compared to long-term residents (16+ years). This finding suggests that this specific cohort may face unique, unresolved issues with service integration.

Finally, occupational status also emerged as significant (P = .012). Retired individuals showed notably lower odds (OR = 9.207) of complete service inaccessibility compared to students (the reference category). This protective effect may be attributable to their pension-related engagement with public service systems and an accumulated knowledge of available resources acquired over the life course.

3.3.3. Model results: visually impaired group (RQ6)

The ordinal logistic regression analysis conducted to determine which factors significantly predict public service access levels for individuals with visual impairments yielded detailed findings that are evaluated and presented in Table 14. This analysis assesses the predictive power of variables including age, income, place of residence, educational attainment, gender, marital status, disability rate, duration of disability, and assistive device usage in determining access outcomes.

The ordinal logistic regression analysis for individuals with visual impairments in Table 14 revealed three primary determinants of public service access: place of residence, educational attainment, and disability rate. These factors collectively demonstrated powerful effects on service accessibility patterns within this population. Geographical location emerged as a critical barrier to service access (p = .034). Visually impaired individuals residing in rural areas faced substantially elevated odds—over 40 times higher (OR = 40.30)—of experiencing *No Access* to public services compared to their urban counterparts. This pronounced rural-urban disparity underscores significant geographical inequities and supports the acceptance of the alternative hypothesis (H_1): residing in rural versus urban areas exerts a significant effect on the level of access to public services for visually impaired individuals.

The disability rate also demonstrated a significant protective gradient. Compared to individuals with the most severe visual impairments (81%–100% disability rate), those with moderate impairments (41%–60%) exhibited substantially lower odds (OR = .009, P< .05) of complete service inaccessibility. This pattern indicates that individuals with the highest levels of visual impairment experience disproportionately limited access.

Educational attainment emerged as the most powerful predictor of service access, with dramatic disparities observed across all educational levels when compared to postgraduate students (the reference category). All education levels below this reference were highly significant (P< .001) and associated with astronomical odds of reporting *No Access* (e.g., Not literate: OR = 7.51 x 10^8; Literate: OR = 3.67 x 10^{10}; High School graduate: OR = 2.11 x 10^8). This substantial geometric increase underscores the critical and transformative role of technology in facilitating service access. As survey participants noted, applications on smartphones are indispensable for daily life. Higher educational attainment strongly correlates with the technological proficiency required to utilize these assistive tools, enabling greater independence. Survey data also revealed that visually impaired participants actively seek tax reductions on smartphones specifically to enhance their service access capabilities. The technology-education nexus thus represents a critical pathway for reducing dependence on caregivers and improving autonomous engagement with public service systems, while a lack of this proficiency represents a near-insurmountable barrier.

Table 14- Results of the ordinal logistic regression model for the visually impaired group (N = 60)

Variable	*β*	*SE*	*Wald χ2*	*df*	*p*	*95% CI for β*	*OR*
Thresholds							
[Access Level = 1] (Full)	25.208	4.379	33.137	1	< .001	[16.625, 33.791]	
[Access Level = 2] (Limited)	34.002	5.702	35.558	1	< .001	[22.826, 45.178]	
Predictor Variables							
Age	0.1	.06	2.737	1	.098	[-.018, .219]	1.105
Income	8.938	5.57	2.569	1	.109	[.000]	1.000
Place of residence*							
Rural area	3.696	1.743	4.495	1	.034	[.279, 7.113]	40.299
Urban area (Reference)	0[a]	—	—	0	—	—	—
Education							
Not literate	20.437	2.915	49.165	1	<.001	[14.725, 26.150]	7.51×10^{8}
Literate	24.326	3.271	55.303	1	<.001	[17.915, 30.737]	3.67×10^{10}
Primary Education	20.384	1.696	144.488	1	<.001	[17.061, 23.708]	7.13×10^{8}
High School	19.168	1.366	196.84	1	<.001	[16.491, 21.846]	2.11×10^{8}
University Student	18.259	1.802	102.656	1	<.001	[14.727, 21.791]	8.50×10^{7}
Graduate	19.222	0.00		1		[19.222, 19.222]	2.23×10^{8}
Postgraduate Student (Reference)	0[a]	—	—	0	—	—	—
Gender							
Female	.486	.952	.261	1	.61	[-1.380, 2.352]	1.623
Male (Reference)	0[a]	—	—	0	—	—	—
Marital Status							
Married	3.447	2.568	1.802	1	.18	[-1.587, 8.482]	31.421
Single	3.651	2.89	1.596	1	.207	[-2.014, 9.315]	38.502
Widowed (Reference)	0[a]	—	—	0	—	—	—
Disability Rate							
41%–60%	-4.656	1.556	8.953	1	.003	[-7.706, -1.606]	.009
61%–80%	-.875	.939	.868	1	.352	[-2.715, .966]	.417
81%–100% (Reference)	0[a]	—	—	0	—	—	—
Duration of Disability							
1–10 years	.528	1.388	.145	1	.704	[-2.192, 3.248]	1.695
11–20 years	1.327	1.777	.558	1	.455	[-2.155, 4.809]	3.768
21–30 years	-1.191	1.109	1.153	1	.283	[-3.366, .983]	.304
31+ years (Reference)	0[a]	—	—	0	—	—	—
Assistive Device							
Not using	1.016	1.139	.797	1	.372	[-1.215, 3.248]	2.763
Using (Reference)	0[a]	—	—	0	—	—	—

*Note. β = beta coefficient; SE = Standard Error; CI = Confidence Interval; OR = Odds Ratio. Reference categories are denoted with an em-dash (—). *This variable determines rural-urban disparities in access. [a]Statistics (Wald, p) are undefined due to quasi-complete separation for this category*

4. Conclusions

This study examined access to essential public services for individuals with physical, hearing, and visual disabilities in Antalya Province, focusing on the differential impact of rural-urban residence. The findings confirm that while service access is constrained for all disability groups, the nature of the barriers is not uniform. Through ordinal logistic regression analyses of three distinct disability populations, the research revealed that service access remains substantially constrained across all groups, although the specific barriers and their relative salience vary considerably by disability type, creating unique access profiles for each population.

4.1. Summary of key findings

The investigation yielded three distinct patterns of accessibility:

- Individuals with *physical disabilities* experienced *Limited Access* regardless of geographical location. For this group, place of residence was not a significant predictor; rather, occupational status emerged as the primary determinant, with stable employment and retirement offering a significant protective effect.

- A sharp rural-urban divide was evident in *hearing impaired* participants. Urban residents achieved *Full Access*, while rural residents experienced *Limited Access*. Rural residence was a highly significant predictor, dramatically increasing the odds of *No Access*. This was compounded by age, which acted as a significant vulnerability, and disability severity.

- The group with *visual impairments* faced a severe *Limited Access* level, which was dramatically exacerbated by geography. Rural residence was a strong predictor of *No Access*. However, the most dominant predictor was educational

attainment. The extraordinarily large effect sizes associated with lower education highlight that a lack of technology literacy (e.g., proficiency with smartphones) constitutes a near-insurmountable barrier.

In essence, across both sensory disability groups, disability severity exhibited a consistent pattern: individuals with the highest impairment levels experienced significantly and disproportionately limited access compared to those with moderate impairments. This represents a critical equity concern, as those with the greatest functional limitations encounter the most substantial barriers.

4.2. Policy implications and recommendations

The study's findings carry significant implications for disability policy and service delivery systems in Türkiye. The primary expectation articulated by participants was the ability to access basic public services independently, without requiring assistance from others. This fundamental aspiration must guide policy development and service redesign across all sectors.

Addressing Rural-Urban Disparities. The pronounced geographical inequities for sensory disabilities necessitate multi-faceted interventions. For rural areas, where physical distance compounds access barriers, establishing centralized service hubs in pilot regions with free shuttle services for individuals with disabilities would reduce transportation obstacles. Ensuring that all service buildings comply with universal design principles and employing dedicated support personnel for individuals with disabilities will minimize access challenges. Mobile service delivery models and telecommunications-based service options should be developed to bridge geographical gaps where physical infrastructure proves insufficient.

Prioritizing Technology Access and Digital Literacy. The critical role of technology for visually impaired individuals supports policy interventions such as subsidized access to assistive technologies and digital literacy training. Participants specifically requested tax reductions on smartphones, a modest intervention that could yield substantial returns in functional independence.

Accommodating Disability Severity and Age. The inverse relationship between disability severity and access demands proactive outreach mechanisms and enhanced accommodations for individuals with the most profound impairments. For hearing-impaired older adults, age-appropriate communication strategies must be integrated into service delivery.

Strengthening Employment and Economic Security. The protective effects of stable employment suggest labor market integration is a powerful determinant of service access. Establishing separate employment quotas for individuals with disabilities in rural areas and facilitating collaboration among ministries, NGOs, and institutions like İŞKUR are crucial.

Reconceptualizing Service Delivery Systems. Public service access must be replanned with effective supervision mechanisms. Critically, agricultural policies and rural development strategies, which currently fail to address disability, must incorporate individuals with disabilities as beneficiaries and include them in public decision-making bodies.

Data Infrastructure and Evidence Base. The absence of up-to-date, disaggregated statistics on individuals with disabilities hampers evidence-based policymaking. Establishing thorough databases with separate rural and urban indicators would enhance both the quantity and quality of disability support initiatives. Such data systems are essential for monitoring progress, identifying emerging needs, and evaluating intervention effectiveness.

Special Considerations. The recent earthquake in Türkiye has brought the vulnerability of individuals with disabilities in disaster situations to the forefront. Developing evacuation protocols and emergency response systems for individuals with disabilities in both urban and rural areas demands urgent, interdisciplinary attention. Social assistance measures for rural populations should improve disability awareness, provide needs-based education tailored to each disability group, enhance patient transport vehicles for healthcare access, and ensure accessible public transportation represent critical components of rural development policies.

4.3. Limitations and future directions

The primary limitation of this study is the use of snowball (chain) sampling. This method was adopted because the lack of published statistical data on the spatial distribution of individuals with disabilities in Antalya precluded a standard sampling frame. However, this non-probability sampling technique restricts the generalizability of the findings.

Future research should explore the causal mechanisms underlying the reported disparities and incorporate qualitative investigation to understand the lived experiences of individuals with disabilities, longitudinal tracking of service utilization patterns, and rigorous evaluation of the targeted interventions proposed in this paper, such as technology provision programs, rural mobile services, and age-appropriate accommodations.

4.4. Concluding reflections

This research contributes to the literature by demonstrating that access barriers reflect complex interactions among functional limitations, socioeconomic resources, geographical context, and service system design. The finding that even urban residents

with disabilities face substantial constraints—with rural disparities further exacerbating these challenges—indicates systemic deficiencies requiring countrywide reform. Achieving equitable access will require moving beyond disability-neutral policies toward disability-responsive approaches that acknowledge the distinct barriers confronting different populations. Only through such evidence-informed, disability-specific strategies can Türkiye fulfill its commitments under the UN Convention on the Rights of Persons with Disabilities and realize genuine social inclusion for all its citizens.

Author Declarations

Authors' contributions: The authors contributed equally to the conception, design, execution, and/or interpretation of the study.

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