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RESEARCH ARTICLE

THE INFLUENCE OF ACCESS BARRIERS ON THE USE OF PUBLIC HOSPITAL OUTPATIENT SERVICES AMONGST LOW-INCOME HOUSEHOLDS IN MALAYSIA

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ABSTRACT

AIM:

Many people, particularly those from low-income and marginalised communities, face barriers when accessing healthcare services. Therefore, this study examined the influence of household characteristics and perceived access barriers on the utilisation of outpatient services among low-income households living in urban and rural areas.

METHODS:

This cross-sectional study employed 454 university students as proxies for low-income households. Data on household characteristics, perceived household medical needs and perceived access barriers were collected using online and printed questionnaire forms. The measure of perceived access barriers included items that represented various dimensions, including personal barriers, structural barriers, financial barriers, perceived triviality, accessibility, and time limitations.

MAIN FINDINGS:

The distance between household dwellings and public healthcare facilities as well as perceived household medical needs significantly influenced the use of outpatient care for urban and rural households. However, the influence of employment status and household size was only significant among urban households. In terms of perceived access barriers, financial barriers were found to have a negative influence on the use of outpatient services among urban households, while time limitations were strongly associated with reduced outpatient use among rural households. Perceived triviality and accessibility also exhibited statistical significance in influencing the use of outpatient services among urban and rural households, with moderate to large effect sizes.

CONCLUSION:

The findings of this study provided valuable insights into the use of outpatient services, accessibility and barriers encountered by low-income households living in urban and rural areas. Efforts to improve access are crucial in addressing health inequities and promoting a more just and equitable society.

KEYWORDS

access, outpatient, urban, rural, barriers

INTRODUCTION

Access to healthcare is a fundamental human right that has significant implications for the health and well-being of individuals and communities. It refers to the ability of individuals to obtain necessary medical care, including preventive, diagnostic and treatment services. [1] However, access to healthcare is not equally distributed, and many people, particularly those from low-income and marginalised communities, face barriers. [2]

Malaysia has made significant progress in improving healthcare delivery over the past few decades. The country has implemented various reforms and policies to improve the quality, accessibility, and affordability of healthcare services. These reforms have included the establishment of universal health coverage through the National Health Insurance Scheme, the expansion of primary care services and the development of health care infrastructure, including hospitals and clinics. [3-5] Additionally, the country has placed great emphasis on disease prevention and health promotion by focusing on addressing non-communicable diseases such as diabetes and cardiovascular disease. [6]

Despite these efforts, challenges persist in achieving equitable access to quality healthcare services for low-income and rural communities. Studies conducted in Malaysia have identified various barriers related to healthcare access, including financial constraints, lack of information, transportation difficulties, and language and cultural barriers. [7-9] These barriers have significant implications for the health and well-being of individuals and communities, particularly for those with chronic diseases such as diabetes. [10]

Although the number is limited, studies conducted in Malaysia have highlighted the presence of social inequity in terms of healthcare access. [11] Risso-Gill et al. identified financial constraints, lack of information, language barriers and cultural differences as main factors that influenced access in a mixed-method study that examined barriers to hypertension management within the health system. [12] Barriers to access were analysed based on geographical locations and distances, revealing significant urban-rural disparities in healthcare access. [13-15] Consistently, rural residents were found to experience more barriers in accessing healthcare than urban residents. [14, 15] Besides, transportation difficulties and a lack of healthcare facilities were commonly reported issues among rural residents. [16, 17] Conversely, the limiting factors for access among urban-poor residents were conceptualised as personal, structural, and financial barriers. [7] In a study, these limiting factors were found to correlate significantly with marital status and household income. [8]

More studies are needed to explore healthcare access issues and barriers in Malaysia. Although some factors were identified in previous studies, it is crucial to examine these factors on healthcare utilisation. Thus, there is a need to quantify the extent to which these factors affect the utilisation of healthcare services, particularly outpatient services. This will enable policymakers make well-informed decisions and implement comprehensive and well-targeted interventions. Such efforts are essential to address specific needs of diverse populations, including those living in poverty, rural areas, and marginalised communities.

METHOD

STUDY DESIGN AND SETTING

This study employed a cross-sectional research design involving university students as household representatives. The study was conducted from May 1, 2022 to May 31, 2023. Universiti Teknologi MARA (UiTM) was selected as the recruitment setting due to its extensive network of campuses across Malaysia. The university offers significantly subsidised tuition fees to incentivise the enrolment of students from low-income families, with approximately RM600 or USD135 per semester for an ordinary undergraduate course. Recent statistics indicated that UiTM has approximately 160,000 students enrolled in various academic programs and levels, with 70% of them originating from low-income families.

DATA COLLECTION

Five hundred students who enrolled in an academic program at a single UiTM campus were invited to join this research. We included students who met the following criteria: 1) enrolled in a full-time undergraduate program in any discipline, 2) currently living with their parents, and 3) with combined parent incomes of less than RM4,850 (USD1,115). We excluded students who: 1) were enrolled in postgraduate programs, 2) were part-time students, 3) lived independently of their parents, or 4) had parents with a combined income of RM4,850 or more. In Malaysia, a household with a monthly income below RM4,850 falls within the bottom 40% of income earners (B40). [18] As proxies for households, the students were first briefed about their roles and the objectives of the research project. Those who agreed to participate were given a questionnaire form and were instructed to complete it within a week. Sufficient time was allocated to gather information from family members on household characteristics, perceived access barriers, and use of outpatient care.

MATERIALS AND STUDY TOOLS

A questionnaire was developed to collect data on various household characteristics, including household size, monthly income, marital and employment status of household head, residential area, region and perceived household medical needs. The questionnaire included items that measured perceived access barriers to public hospital outpatient care and captured the number of outpatient visits within the 12-month study period. Additionally, respondents were required to estimate the distance (km) from their household dwelling to the nearest public hospital outpatient facility.

The perception of access barriers was measured in 6 dimensions: personal, structural, financial, perceived triviality, accessibility, and time limitation. The personal barrier construct was developed based on patient-provider communication issues (3 items), perceived public stigma (3 items), and perceived side effects from consuming modern medications (4 items). The items measuring structural barriers were constructed based on perceived service availability (4 items), system and organisational efficiency (5 items), and perceived transportation issues (3 items). Items were also constructed to measure the dimension of financial barrier (4 items), perceived triviality (4 items assessing the disposition regarding the need for prompt medical care in the event of sickness), accessibility (4 items measuring agreement on the unavailability of services at nearby public facilities and the need to travel far to access them), and time limitation (4 items evaluating the practical difficulties in finding time to visit healthcare facilities and long waiting time to receive treatment). Psychometric assessments of the questionnaire items were conducted using exploratory factor analyses (EFA) and confirmatory factor analyses (CFA). The instrument was constructed accordingly, and the 6-factor model of access barriers demonstrated an appropriate fit. The corresponding alphas calculated for each dimension also indicated a high level of internal consistency for the measurement. Questionnaire items for perceived access barriers and perceived household medical needs were measured using a 5-point scale. For perceived access barriers, the scale ranged from 1 (indicating a strong disagreement) to 5 (indicating a strong agreement). The scale for perceived household medical needs ranged from 1 (indicating low medical needs) to 5 (indicating high medical needs). The measurement framework for perceived access barriers was adapted from studies that measured access barriers among the urban poor in Malaysia and other notable international studies examining access barriers to healthcare services. [7-8, 19-22].

STATISTICAL ANALYSIS

Descriptive analyses were conducted on studied variables using frequency and percentage for categorical variables, and interquartile range, mean and standard deviations for continuous variables. To measure the influence of household characteristics and perceived access barriers on outpatient use, *marginalised zero-inflated negative binomial* (MZINB) regression were performed. [23] In these analyses, household characteristics, perceived household medical needs and perceived access barriers were included as predictor variables. The number of outpatient visits within the past 12 months served as the outcome variable. Analyses were stratified based on the area of residence (urban and rural). All reported *P*-values were 2-tailed, and a significance level of $P<.05$ was used. Stata Statistical Software: Release 17 (StataCorp, College Station, TX) was utilised for data analysis.

ETHICS CONSIDERATION

This study received approval from the Institutional Review Board of Universiti Teknologi MARA, Malaysia (Ethics Committee of the Faculty of Business & Management, Universiti Teknologi MARA). Ethics approval code: REC/08/2023 (PG/MR/200)

RESULTS

A total of 454 completed questionnaire forms were returned to the investigators, indicating a response rate of 90.8%. The data from these questionnaire forms were extracted and analysed.

HOUSEHOLD CHARACTERISTICS

On average, rural households had slightly more household members than urban households. Rural household heads were primarily self-employed. Most household heads were married and completed middle-school education. Rural households had significantly lower monthly incomes than urban households. Many rural households were located in Malaysia's northern and east coast regions, while urban households were mostly located in northern and central regions.

The average distance to the nearest public healthcare facilities was significantly shorter for urban households (11 km) than rural household residents (13 km). Generally, rural households reported higher medical needs than urban households. 56% (*n* = 260) households utilised outpatient services in the past 12 months. The rate of outpatient service utilisation was higher among rural residents (62.2%, *n* = 112) than urban residents (52.9%, *n* = 146). Analyses comparing the characteristics of households based on the area of residence revealed statistically significant differences.

TABLE 1: SUMMARISES THE HOUSEHOLD CHARACTERISTICS ACCORDING TO THE RESIDENCE AREA.

Household characteristics	Urban (*n* = 276)		Rural (*n* = 178)		
	n	%	*n*	%	*P*
No. of Household members, *M* (*SD*)	5.27	(1.82)	6.56	(1.50)	<.001
Age					
30 - 39	8	2.9	-		
40 - 49	92	33.3	24	13.5	
50 - 59	120	43.5	62	34.8	
60 – 69	48	17.4	68	38.2	
≥ 70	8	2.9	24	13.5	<.001
Employment status of household head					
Government employee	68	24.6	10	5.6	
Private employee	82	29.7	10	5.6	
Self-employed	70	25.4	114	64.0	
Retired from government service	34	12.3	24	13.5	
Retired from private service	12	4.4	18	10.1	
Unemployed	10	3.6	2	1.1	<.001
Marital status of household head					
Married	228	82.6	116	65.2	
Divorced	20	7.3	8	4.5	
Spouse has passed away	28	10.1	54	30.3	<.001
Education Level of household head					
Primary Education	2	0.7	20	11.2	
Lower secondary education	8	2.9	40	22.5	
middle secondary education	104	37.7	48	27.0	
Higher secondary education	72	26.1	22	12.4	
College/university	84	30.4	12	6.74	
No formal education	6	2.2	36	20.2	<.001
Combined monthly income					
< RM2,500	64	23.2	128	71.9	
RM2,500 – RM3,169	74	26.8	28	15.7	
RM3,170 – RM3,969	18	6.52	12	6.7	

Household characteristics	Urban (*n* = 276)		Rural (*n* = 178)		
	n	%	*n*	%	*P*
RM3,970 – RM4,849	120	43.5	10	5.6	<.001
Region of residence					
Northern	86	31.2	56	31.5	
Central	78	28.3	20	11.2	
Southern	40	14.5	30	16.9	
East coast	54	19.6	44	24.7	
West Malaysia	18	6.5	28	15.7	<.001
Distance in kilometres; *M* (*SD*)	10.78	(7.07)	12.64	(7.64)	<.001
Medical Needs, *M* (*SD*)	2.51 (0.77)		2.80	(0.87)	<.001
Outpatient visit [a], *M* (95% CI)	3.31 (2.84 – 3.61)		3.28	(2.88 – 3.72)	<.001

[a]Data were described using geometric mean with a 95% confidence interval (CI) in parentheses. The significant difference was estimated using the Mann-Whitney U test

ACCESS BARRIERS TO OUTPATIENT SERVICES

Descriptive statistics on measures of perceived access barriers are presented in Table 2. Rural households reported a higher perception of barriers compared to urban residents, except for perceived time limitations. The mean values of personal barriers, financial barriers and accessibility differed significantly between urban and rural households, with statistically large effect sizes.

TABLE 2: SUMMARY OF DESCRIPTIVE STATISTICS OF PERCEIVED ACCESS BARRIERS

		Urban (*n* = 276)		Rural (*n* = 178)		Difference [a]			Effect size [b]	
Measure	*α*	*M*	SD	*M*	SD	*t*	*df*	*P*	*g*	95% CI
Personal barriers	0.95	2.84	0.95	3.40	1.20	-5.26	317.49	<.001	-0.53	-0.72 – -0.33
Structural barriers	0.94	3.66	0.76	3.80	0.99	-1.58	309.59	0.12	-0.16	-0.34 – 0.02
Financial barriers	0.94	3.31	0.96	3.75	1.09	-4.35	344.02	<.001	-0.42	-0.62 – -0.24
Perceived triviality	0.85	3.30	0.95	3.38	1.17	-0.73	323.27	0.46	-0.07	-0.26 – 0.11
Accessibility	0.91	3.02	1.19	3.64	1.18	-5.47	382.02	<.001	-0.52	-0.71 – -0.33
Time limitation	0.90	3.75	0.90	3.67	1.11	0.79	324.58	0.43	0.08	-0.10 – 0.27

[a] Significant difference was assessed using the Welch t-test.

b Effect sizes were calculated using Hedges' g

INFLUENCE OF HOUSEHOLD CHARACTERISTICS ON OUTPATIENT SERVICES UTILISATION

An increase in household size is associated with increased outpatient visits among urban households (β = 0.22, *p* <.001). This estimate suggests that for each additional household member, the expected log count of outpatient visits increases by approximately 27%. Additionally, urban household heads who were employed by private companies were 1.7 times more likely to use outpatient services than government employees (β = 0.51, *p* <.023). Furthermore, unemployed urban household heads were 16 times [exp (2.79)] more likely to use outpatient services than government employees (β = 2.80, *p* < .001).

The use of outpatient services was affected by the distance between household dwellings and public outpatient facilities. A positive coefficient was observed in urban households, indicating that there was an increase in outpatient visits as the distance increased (β = 0.03, *p* <.007). In contrast, a negative coefficient was observed in rural households, suggesting that as the distance increased, the likelihood of households visiting outpatient facilities decreased (β = -0.06, *p* <.001). Urban and rural households with a higher perception of medical needs were more likely to use outpatient services than those who reported lower medical needs (urban: β = 0.48, *p* <.001; rural: β = 0.12, *p* <.001). Table 3 summarizes the result of regression analyses.

TABLE 3: RESULTS OF REGRESSION ANALYSES ON THE INFLUENCE OF HOUSEHOLD CHARACTERISTICS ON OUTPATIENT VISITS.

	Urban (n = 279)				*Rural (n = 178)*			
	Coef.	**SE**	**95% CI**	***P***	**Coef.**	**SE**	**95% CI**	***P***
Household member	0.22	.04	0.20 – 0.34	<.001	0.12	0.07	-0.02 – 0.25	0.087
Age								
30 - 39	Ref.				Ref.			
40 - 49	0.78	0.80	-0.78 – 2.36	0.325	-			
50 - 59	1.36	0.79	-0.22 – 2.87	0.093	-0.15	0.26	-0.64 – 0.33	0.569
60 – 69	1.48	0.79	-0.07 – 3.03	0.062	-0.08	0.75	-0.41 – 0.56	0.754
≥ 70	1.80	0.87	0.10 – 3.49	0.038	-0.36	0.35	-1.04 – 0.33	0.307
Employment status								
Government employee	Ref.				Ref.			
Private employee.	0.51	0.23	0.07 – 0.96	0.023	-1.73	0.46	-2.63 – -0.83	<.001
Self-employed	1.32	0.27	0.79 – 1.86	<.001	-0.71	0.51	-1.71 – -0.29	0.166
Retired (government)	0.57	0.33	-0.07 – 1.21	0.081	-0.01	0.50	-0.99 – 0.95	0.976
Retired (private)	0.78	0.42	-0.04 – 1.60	0.062	-1.04	0.53	-2.08 – -0.01	0.052
Unemployed	2.80	0.69	1.43 – 4.15	<.001	-55.0	-	-	-
Marital status								
Married	Ref.				Ref.			
Divorced	0.82	0.23	0.37 – 1.26	<.001	-0.24	0.28	-0.78 – 0.30	0.380
Spouse passed	-0.07	0.23	-0.53 – 0.39	0.756	0.14	0.18	-0.20 – 0.49	0.418
Education Level								
Primary	0.38	0.62	-0.84 – 1.59	0.544	0.69	0.44	-0.18 – 1.55	0.120
Lower Secondary	1.39	0.40	0.61 – 2.17	<.001	0.87	0.39	0.10 – 1.63	0.026

	Urban (n = 279)				Rural (n = 178)			
	Coef.	SE	95% CI	P	Coef.	SE	95% CI	P
middle secondary	-0.03	0.23	-0.48 – 0.43	0.905	0.87	0.38	0.12 – 1.62	0.023
Higher Secondary	0.03	0.19	-0.34 – 0.40	0.876	1.38	0.42	0.57 – 2.19	0.001
College/university	Ref.				Ref.			
No formal education	-0.68	0.35	-1.36 – -0.01	0.054	0.17	0.44	-0.70 – 1.04	0.698
Monthly Income								
< RM2,500	-0.02	0.18	-0.49 – 0.44	0.935	0.56	0.46	-0.34 – 1.46	0.224
RM2,500 – RM3,169	-0.91	0.20	-1.31 – -0.51	<.001	0.84	0.47	-0.08 – 1.76	0.074
RM3,170 – RM3,969	-0.89	0.34	-1.55 – -0.23	0.008	1.13	0.36	0.44 – 1.82	0.001
RM3,970 – RM4,849	Ref.				Ref			
Region of residence								
Northern	-0.14	0.18	-0.49 - 0.20	0.417	-0.54	0.25	-1.03 – -0.05	0.030
Central	Ref.				Ref			
Southern	-0.37	0.20	-0.75 – -0.02	0.061	-0.69	0.24	-1.16 – -0.22	0.004
East coast	-0.34	0.20	-0.73 – 0.05	0.091	-0.38	0.23	-0.83 – 0.07	0.100
West Malaysia	-0.84	0.29	-1.40 – -0.27	0.004	-0.18	0.27	-0.71 – 0.35	0.510
Distance in km	0.03	0.01	0.01 – 0.07	<.007	-0.06	0.01	-0.08 – -0.04	<.001
Medical needs	0.48	0.08	0.32 – 0.63	<.001	0.52	0.12	0.29 – 0.76	<.001

Abbreviation: SE = standard error; Ref. = reference

PERCEIVED ACCESS BARRIERS TO OUTPATIENT SERVICES.

Financial issues were found to influence outpatient visits negatively among urban households (β = -0.44, *p* <.001) . Statistically, a higher perceived cost was associated with a lower likelihood of household utilisation of outpatient services. The perception of an illness as not severe and not requiring immediate medical attention, as measured by perceived triviality, was also a statistically significant factor influencing outpatient service use among urban (β =-0.25, *p* <.006) and rural households (β = -0.39, *p* <.001). The impact of this perception on outpatient use was more substantial among rural households than urban households.

Interestingly, the perception of the unavailability of medical services at the nearest healthcare facilities and the need to travel long distances did not have a negative influence on outpatient use, despite being statistically significant (urban: β = -0.21, *p* <.025; rural:β = 0.15, *p* <.001). Nonetheless, time limitations significantly reduced the likelihood of rural households using outpatient services (β = -0.77, *p* <.001). This perception had the most significant effect on the decision of rural households to use outpatient services compared to other factors, and it was statistically significant among rural households. Table 4 summarises the results of perceived access barriers and their influence on outpatient visits.

TABLE 4: RESULTS OF REGRESSION ANALYSES ON PERCEIVED ACCESS BARRIERS AND OUTPATIENT USE AMONG URBAN AND RURAL HOUSEHOLDS.

	Urban (n = 279)				*Rural (n = 178)*			
	Coef.	**SE**	**95% CI**	***P***	**Coef.**	**SE**	**95% CI**	***P***
Personal barriers	-0.09	0.13	-0.34 – -0.14	0.002	-0.82	0.17	-1.15 – -0.49	<.001
Structural barriers	0.05	0.13	-0.20 – 0.29	0.717	1.14	0.24	0.66 – 1.61	<.001
Financial	-0.44	0.11	-0.64 – -0.23	<.001	-0.07	0.16	-0.39 – 0.25	0.665
Perceived triviality	-0.25	0.09	-0.45 – -0.07	0.006	-0.39	0.11	-0.60 – -0.18	<.001
Accessibility	0.21	0.09	0.02 – 0.39	0.025	0.63	0.15	0.33 – 0.93	<.001
Time limitation	-0.02	0.09	-0.19 – 0.15	0.833	-0.77	0.14	-1.05 – -0.49	<.001
Log-likelihood	-421.88				-263.11			
AIC	913.76				592.22			
BIC	1040.47				697.219			
R-squared (Nagelkerke)	0.54				0.69			

Abbreviation: SE = standard error, CI = Confidence Interval, AIC = Akaike Information Criterion, BIC = Bayesian Information Criterion.

Models were adjusted for all study covariates.

DISCUSSION

The findings from regression analyses indicated that outpatient use among urban households was influenced by household size and the employment status of the household head. Perceived medical needs and the distance to the nearest public outpatient facilities also affected outpatient use in both rural and urban households. Financial issues were the most significant perceived access barrier for urban households, while perceived time limitations strongly influenced rural households' decisions to use outpatient services. Additionally, perceiving prompt medical care as less important during sickness negatively impacted outpatient care use across urban and rural households.

Previous studies corroborate the influence of employment status on outpatient visits. [24, 25] While the impact of household size on outpatient visits is less documented, increased demand is plausible since each household member may have distinct medical needs. Marital status and household income did not significantly influence outpatient visits. However, low-income individuals, particularly in remote areas, often hesitate to seek care due to accessibility issues compounded by transportation, financial, and time constraints. [26]

The study also revealed that individuals with low perceived needs for medical care, often marked by beliefs that their condition will improve on its own, tended to avoid healthcare. This aligns with earlier studies linking such perceptions to healthcare avoidance. [27, 28] Time limitations, indirectly evaluated by difficulties in scheduling outpatient visits and frustration with long waiting times, significantly affected patient satisfaction and healthcare utilization. Long waiting times discourage patients from returning to clinics and reduce overall healthcare use. [29]

These findings highlight the challenges faced by urban and rural households in accessing outpatient care in Malaysia. The Ministry of Health (MOH) and the Malaysian government must review policies and identify areas for improvement to meet community healthcare needs. Although the government provides substantial subsidies for outpatient care in public hospitals—general consultations costing RM1 (USD 0.24) and specialist consultations RM5 (USD 1.22), with waivers for certain groups including senior citizens, government employees, pensioners, and physically, mentally, or economically disadvantaged individuals—indirect costs such as transportation, meals, and lost workdays still impose financial burdens. Collaborations between MOH and other ministries could address these issues by subsidizing transportation, meal allowances, or daily allowances for missed workdays.

The MOH must also address long waiting times in outpatient services. Real-time data and analytics can help monitor patient flow, identify bottlenecks, and improve resource allocation. Hospitals can optimize staffing levels, allocate resources effectively, and streamline patient movement. Organizational changes, including demand-oriented scheduling, should be introduced to enhance outpatient care delivery.

Another significant finding was the negative influence of perceived triviality on outpatient visits. Viewing medical care as unnecessary or relying on self-medication can delay proper evaluation and treatment, potentially worsening conditions. This is particularly dangerous for diseases like dengue fever, where initial symptoms resemble those of common colds. To put this into perspective, Malaysia recorded 45,048 dengue cases from December 2019 to May 2023, with some mortalities linked to treatment delays. [30] Therefore, the government must fund public health outreach programs to improve health literacy, promote preventive care, build trust in healthcare services, and dispel misconceptions.

Strengthening primary healthcare services in underserved areas with high poverty rates is critical. This effort includes improving the availability and quality of primary care clinics, community health centers, and healthcare providers. Collaborative efforts among the community, NGOs, and the education system can further enhance healthcare access. Communities can mobilize resources, build trust, and support local healthcare initiatives. NGOs can fill gaps by delivering essential services, funding programs, and advocating for policy reforms. The education system can raise awareness about preventive care and available services, empowering individuals through health education. Together, these entities can reduce barriers, promote equity, and improve the well-being of underserved populations.

This study had limitations. Self-reporting and retrospective data may introduce biases related to memory and reporting issues. It remains unclear whether non-outpatient users refrained from seeking care due to the absence of illness or by choice. Additionally, some non-users may have received outpatient services from private facilities, particularly those with employment-based health plans. Future studies should examine these aspects.

Selection bias, inherent in the study design and convenience sampling method, may have led to underestimating or overestimating outcomes. Although efforts were made to minimize bias by including all studied variables in the statistical model and maintaining a sufficient sample size, the findings should be interpreted cautiously.

The estimates were derived using marginalized zero-inflated negative binomial regression, which effectively models count data with over-dispersion and excess zeros. This method has proven superior to traditional Poisson or negative binomial models. Analyses were conducted based on household location, enabling meaningful comparisons of estimates. The technique also facilitates estimating marginal means and interpreting coefficients as population-average parameters. Future researchers are encouraged to adopt similar methods when analyzing outpatient data.

CONCLUSION

This study underscores significant barriers to outpatient care access for both urban and rural households in Malaysia, primarily influenced by factors such as household size, employment status, perceived medical needs, and logistical challenges. While government subsidies for outpatient services are beneficial, indirect costs and long waiting times remain

substantial impediments. The negative perceptions surrounding medical care, particularly in the context of self-medication and triviality, further complicate the healthcare landscape, risking severe health outcomes for individuals.

To enhance access and utilization of outpatient services, it is crucial for the Ministry of Health to implement targeted policies, such as subsidizing transportation and meal costs and optimizing resource allocation through real-time data monitoring. Strengthening primary healthcare services in underserved areas, alongside collaborative efforts among communities, NGOs, and the education system, will be essential in promoting health literacy and preventive care. These collective actions can help reduce barriers, improve healthcare equity, and ultimately enhance the health outcomes of underserved populations, addressing healthcare access concerns comprehensively. Future research should delve deeper into non-user motivations and the implications of private healthcare usage to provide a more holistic understanding of outpatient care dynamics.

AUTHORSHIP

The manuscript has been read and approved by all named authors and that there are no other persons who satisfied the criteria for authorship but are not listed. The order of authors listed in the manuscript has been approved by all authors.

AUTHOR'S DISCLOSURE STATEMENT

The authors declare that they have no conflicts of interest.

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