

ORIGINAL ARTICLE

Factors Affecting the Use of Outpatient Services Among Rural Population in Sabah, Malaysia

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ABSTRACT

Introduction: Health outcomes in Sabah are generally below the national average and may be even worse in rural areas with limited health resources. Primary care plays a crucial role in facilitating appropriate referrals to secondary care through outpatient services. This study uses Andersen's behavioural model to assess outpatient healthcare utilisation in Nabawan, examining user characteristics and variables impacting service usage. **Materials and methods:** Guided face-to-face interviews were conducted between February and May 2019 in 25 villages, with 438 respondents randomly selected in the Nabawan district. Participants were asked if they had visited an outpatient facility in the past two weeks. Descriptive statistics were used to assess respondent characteristics, while multiple logistic regression analysis was employed to investigate the relationship between various factors and outpatient care usage. **Results:** From the total respondents, 17.8% (78) reported visiting an outpatient facility in the preceding two weeks. Those who reported moderate or mild health restrictions were eight times more likely to need outpatient treatment than those with no health limitations (AOR = 7.6, 95% CI = 1.990, 29.040). Additionally, individuals with one illness were three times more likely to use outpatient care (AOR = 2.630, 95% CI = 1.220, 5.660), while those with multiple illnesses were seven times more likely (AOR = 6.770, 95% CI = 2.680, 17.090). **Conclusion:** Individuals' belief in their own needs, including self-reported health restrictions and disease history, drives them to seek care. This belief may also affect their adherence to medical advice, treatment recommendations, and follow-up care. *Malaysian Journal of Medicine and Health Sciences* (2024) 20(6): 98-109. doi:10.47836/mjmhs20.6.15

Keywords: Health care, Health determinants, Health services, Outpatient health service utilisation, Rural population

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providing medical care (3). Additionally, they serve as the foundation for directing patients to more specialised and advanced levels of healthcare services, including advanced treatment and complex surgeries (3).

INTRODUCTION

The healthcare system in Malaysia has undergone significant transformation since achieving independence, with the establishment of universal health coverage as a cornerstone to ensure unimpeded access to essential services (1). Notably, it has achieved greater success compared to many other countries in this regard (2). Primary care services, serving as the initial point of contact for patients seeking treatment for common ailments such as colds and flu, regular check-ups, vaccinations, and minor accidents, play a vital role in

Despite nationwide health improvements, Sabah, a region with historical ties to British colonisation and now part of Malaysia, continues to face substantial health disparities. In 2018, Sabah reported the highest rates of infant mortality (10.1 per 1,000 live births), toddler mortality (0.6 per 1,000 population), and maternal mortality (18.9 per 100,000 live births) (4). Ongoing challenges persist in efforts to control diseases such as tuberculosis and malaria. Adding to the complexity, there has been a concerning surge in the prevalence of chronic diseases. Notably, self-reported diabetes has escalated from 2.5% to 5.9%, hypercholesterolemia

from 5% to 8.3%, and hypertension from 10% to 12.2% between 2011 and 2015, as reported by Bakar et al. (5,6).

Efficient healthcare provision, especially in remote areas, is crucial for addressing both infectious and non-infectious diseases. Rural communities in Malaysia benefit from substantially subsidised public health facilities that offer affordable or free, accessible care to the population. However, the availability of healthcare services in East Malaysia, particularly in the rural regions of Sabah, lags significantly behind that in Peninsula Malaysia (7).

Access to healthcare services is intricately linked to individuals' lower socioeconomic status, resulting in substantial implications for their health outcomes (8). Moreover, this predicament is often exacerbated by a higher prevalence of risky behaviours such as smoking and drinking (9). Despite a 6.1% increase in economic development in 2015, Sabah's per capita GDP remains among the lowest in the country (10). The Ministry of Economy reported a poverty rate of 19.5% in 2019 (11). Furthermore, Sabah faces an unusually high smoking rate of 25.3% among individuals aged 15 years and older (12). The Institute for Public Health notes that the state has the highest percentage of adults aged 18 and above engaging in binge drinking, reaching a prevalence of 74.8% (12). These socioeconomic factors and health behaviours contribute to the complex health landscape in Sabah, underscoring the urgent need for targeted interventions to address both the immediate healthcare challenges and the underlying determinants of health disparities.

We take into account the theoretical frameworks put forth by Andersen (1995) (13), Dutton (1986) (14), Evans and Stoddart (1990) (15), Grossman (1972) (16), and Rosenstock (2005) (17) to guide this analysis. Andersen's behavioural model is particularly employed in this study to identify the factors influencing the utilisation of outpatient services, focusing on predisposition, enabling, need, and behavioural (18).

While various studies have investigated the pattern of healthcare utilisation and its determinants (19–21), such research has been scarce in the context of the rural population in Sabah, characterised by high levels of poverty. This study aims to fill this gap by employing Andersen's behavioural model to examine the frequency of outpatient treatment, the characteristics of individuals utilising outpatient care, and the factors influencing the usage of outpatient services within the Nabawan community. Through this research, we aim to contribute valuable insights to the development of targeted healthcare interventions that address the unique

challenges faced by the rural population in Sabah.

MATERIALS AND METHODS

The cross-sectional study, spanning four months, aimed to address economic challenges and a significant prevalence of poverty in a rural region of Sabah. A guided face-to-face interviews were conducted with residents not living in institutions who had been residing in the region for at least two weeks before data collection (22). To ensure uniformity in the research population, individuals in institutional settings were excluded.

The sample size was determined using a single percentage formula, with a precision of 5%, a confidence level of 95%, and a population variance of 33.2%, representing those seeking healthcare advice or treatment in Sabah within the last two weeks (23). Given Nabawan's population of 32,309 and accounting for a non-response rate of 20%, the desired sample size was set at 414 (24). The study areas were divided into Enumeration Blocks (EBs) based on geographical units specified by the National Statistics Department. Each EB comprised approximately 500 to 600 individuals, with an average of 80 to 120 living quarters (LQs). Six EBs were randomly selected to obtain the required respondents from the LQs, considering an average of four individuals per household (25).

The study employed a questionnaire derived from the National Health and Morbidity Survey. All respondents provided consent before the interview, conducted in the Malay language between February 23 and June 25, 2019. The data collection used Epi Info version 7.2.2.6 as the database, while analysis was performed using STATA 14.1.

The study focused on measuring the extent of outpatient care service utilisation over a specific 2-week period. The independent variables included predisposing (sex, age, marital status, citizenship, ethnicity, highest education, employment, living arrangement and socioeconomic quintile), enabling (income, health coverage, usual payer for health care and barriers to health care), need (self-assessed health, health limitations, disease history), and behavioural (smoking and alcohol consumption) factors, selected based on prior study investigations.

The socioeconomic ranking was derived from household expenditure, which was then adjusted for household size and differences in country-specific consumption patterns. Larger families or those with children require different resources to maintain the same standard of living, depending on their country of residence. This approach, commonly used by the Organisation for Economic Co-operation and Development (OECD)

in comparable analyses, can be summarised with the following formula (26):

$$AE_h = (A_h + \alpha K_h)^\vartheta \quad (27)$$

where,

AE_h is the adult equivalent in household h

A_h is the number of adults in household h

K_h is the number of children 0-14 years old

α (value is 0.5) is the “cost of children” and

ϑ (value is 0.75) reflects the degree of economies of scale.

Households are then divided into quintiles, with the first quintile representing the poorest 20%, and the richest 20% occupying the fifth quintile.

Descriptive statistics were employed to outline outpatient care service utilisation, presenting percentages with a 95% confidence interval across the examined independent variables. Both single- and multiple-logistic regressions were applied to explore factors associated with outpatient care service utilisation. Variables with a significant p-value (<0.25) in the single logistic regression were included in the preliminary final model, following the methodology of Bursac et al. (28). Subsequently, likelihood ratio tests were conducted to determine the final model variables, restricted to those with statistical significance. Logistic regression provided crude and adjusted odds ratios with 95% confidence intervals. Multicollinearity was assessed using the Variance Inflation Factor (VIF). The fitness of the model was evaluated using the receiver operating characteristics (ROC) curve, the Hosmer-Lemeshow test, and a classification Table I. Analyses were conducted in STATA 14.1, with statistical significance set at $p < 0.05$.

Table I: Definition of Independent Variables.

Variable	Definition	Responses / classification
Predisposing factors		
Sex	Reported gender of the household member	Male; Female
Age	Age group of the household member	Less than 14; 15-24; 25-54; 55-64; 65 and older
Marital status	Marital status of the household member	Not married; Married
Citizenship	Citizenship of the household member	Citizen; Non-citizen
Ethnicity	Classification of the main ethnic groups	Murut; Others
Highest education	Highest level of education attained	No schooling; Primary; Secondary; Tertiary
Employment	Currently employed or working	Employed; Self-employed; Not working
Living arrangement	Number of household members	Alone; With others

CONTINUE

Table I: Definition of Independent Variables. (CONT.)

Variable	Definition	Responses / classification
Predisposing factors		
Socioeconomic quintile	Household living standards are adjusted using the adult equivalent.	Quintile 1 (Poorest); Quintile 2; Quintile 3; Quintile 4; Quintile 5 (Richest)
Enabling factors		
Income	Currently receiving income	No; Yes
Health coverage	Covered by government Guarantee Letter (GL)/ private medical/ health insurance	No; Yes
Usual payer for health care	Pays the most for health-care	Self only; Government or employer
Barriers to health care	Factors that prevent people from acquiring access to health services	Ill & sought treatment; Ill & did not seek treatment; Did not need health treatment
Need factors		
Self-assessed health	Measures present general health and gives answer choices on a Likert Scale	Very good; Good; Moderate/Not good; Very Bad
Health limitation	Measures perceived activity limitations of their health condition and gives answer choices on a Likert Scale	Severe/unable to perform; Moderate/mild; None
Disease history	Record of known diseases on the assumption that it was communicated by a doctor or medical assistant. This includes hypertension, asthma, malaria, diabetes, arthritis, heart disease, tuberculosis, stroke, dengue, and renal disease.	Not diagnosed; Diagnosed with 1; Diagnosed with more than 1
Behavioural factors		
Smoking status	Smoking status with light smokers (10 or less cigarettes per day and moderate to heavy (more than 10 cigarettes per day)	Never smoke; Light smokers; Moderate to heavy
Alcohol intakes	Level of alcohol consumption	Never drink alcohol; Once a month 2-4 times/month; More than 4 times/month

Ethical Clearance

Ethics approval was obtained from the Medical Research Ethics Committee, Faculty of Medicine and Health Sciences, Universiti Malaysia Sabah. The approval code is JKEtika 4/17(2). Written informed consent was obtained from all the study participants.

RESULTS

A total of 489 respondents were interviewed. Table II summarise the socio-demographic characteristics of the

respondents. A total of 17.8% (78) of the participants stated that they had visited an outpatient facility within the two weeks preceding the interview. For further details on the participants' attributes, please refer to Table IV. Among those aged 25–54, the reported visits were higher than two-thirds (25, 32.1%). However, the proportion of visits was equal across males and females. Children under the age of 13 also showed a greater frequency of outpatient visits (20, 25.6%). Those who had completed only primary education indicated a greater frequency of visits (35, 44.9%). The categories with highest-reported outpatient utilisation rates, as determined by additional socioeconomic indicators, include "not working" (43, 55.1%), "income recipient" (49, 62.8%), "having no supplementary health coverage" (62, 79.5%), and "self-paying for medical expenses" (55, 70.5%). The wealthy population had higher outpatient usage rates compared to other groups. Specifically, the fourth and richest

quintiles had outpatient utilisation rates of 37.2% (19) and 55.1% (16) respectively, based on adjusted adult equivalent household spending (26). On the other hand, experience with barriers to health care indicated that around 10.3% (8) of them had previously been forced to forego necessary medical care. When asked how they would assess their health on the day of the interview, the majority of respondents selected "very good" (37, 47.4%) or "good" (24, 30.8%). However, over half of the participants reported experiencing moderate to modest difficulties performing their daily tasks or household duties during the 30-day period (44, 56.4%). Furthermore, it was reported that half of the individuals were diagnosed with the health problem. Out of the two lifestyle-related characteristics examined, a total of 14 respondents were identified as smokers, either actively or having previously stopped, while 32 individuals reported consuming alcohol during the last 12 months.

Table II: Characteristics of Respondents. (CONT.)

Characteristics		Frequency	%	(95% CI)
Sex	Male	223	50.9	(46.2-55.6)
	Female	215	49.1	(44.4-53.8)
Age	Less than 14	160	36.5	(32.1-41.2)
	15-24	72	16.4	(13.2-20.2)
	25-54	144	32.9	(28.6-37.4)
	55-64	33	7.5	(5.4-10.4)
	65+	29	6.6	(4.6-9.4)
Marital status	Not married	123	28.1	(24.1-32.5)
	Married	181	41.3	(36.8-46)
	Children <13y/o	134	30.6	(26.4-35.1)
Citizenship	Citizen	422	96.3	(94.1-97.8)
	Non-citizen	16	3.7	(2.2-5.9)
Ethnicity	Murut	394	90.0	(86.8-92.4)
	Others	44	10.0	(7.6-13.2)
Highest education	No schooling	36	8.2	(6-11.2)
	Primary	204	46.6	(41.9-51.3)
	Secondary	116	26.5	(22.6-30.8)
	Tertiary	22	5.0	(3.3-7.5)
	Children <7y/o	60	13.7	(10.8-17.3)
Employment	Employed	48	11.0	(8.4-14.3)
	Self employed	101	23.1	(19.3-27.2)
	Not working	289	66.0	(61.4-70.3)
Living arrangement	Alone	5	1.1	(0.5-2.7)
	With others	433	98.9	(97.3-99.5)
Socioeconomic quintile	Poorest	94	21.5	(17.9-25.6)
	2	86	19.6	(16.2-23.6)
	3	86	19.6	(16.2-23.6)
	4	87	19.9	(16.4-23.9)
	Richest	85	19.4	(16-23.4)
	Income recipient	No	181	41.3
	Yes	257	58.7	(54-63.2)

CONTINUE

Table II: Characteristics of Respondents. (CONT.)

Characteristics		Frequency	%	(95% CI)
Supplementary health coverage	No	351	80.1	(76.1-83.6)
	Yes	87	19.9	(16.4-23.9)
Usual payer for health care	Self only	335	76.5	(72.3-80.2)
	Government/employer	103	23.5	(19.8-27.7)
Barrier to health care in the last 12 months	Ill & seek treatment	198	45.2	(40.6-49.9)
	Ill but did not seek treatment	52	11.9	(9.2-15.3)
	Did not need health treatment	188	42.9	(38.3-47.6)
Self-assessed health	Very good	315	71.9	(67.5-75.9)
	Good	84	19.2	(15.7-23.1)
	Moderate/Not good	33	7.5	(5.4-10.4)
	Very Bad	6	1.4	(0.6-3)
Health limitation	Severe/unable to perform	14	3.2	(1.9-5.3)
	moderate/mild	120	27.4	(23.4-31.8)
	None	304	69.4	(64.9-73.6)
Disease history	Not diagnosed	325	74.2	(69.9-78.1)
	Diagnosed with 1	71	16.2	(13-20)
	Diagnosed with more than 1	42	9.6	(7.2-12.7)
Smoking status	Never smoke	273	62.3	(57.7-66.8)
	Light smokers	75	17.1	(13.9-21)
	Moderate to heavy	30	6.8	(4.8-9.6)
	NA (child <7y/o)	60	13.7	(10.8-17.3)
	Alcohol intakes	Never drink alcohol	244	55.7
	Once a month	22	5.0	(3.3-7.5)
	2-4 times/month	92	21.0	(17.4-25.1)
	More than 4 times/month	19	4.3	(2.8-6.7)
	NA (child <7y/o)	61	13.9	(11-17.5)

Note:

1. NA-Not applicable: This were not asked in children below 7 years old.

Table III: Characteristics of Respondents Who Utilised Outpatient Healthcare

Characteristics		Frequency	%	(95% CI)
Sex	Male	39	50.0	(38.9-61.1)
	Female	39	50.0	(38.9-61.1)
Age	Less than 14	21	26.9	(18.1-38)
	15-24	7	9	(4.3-17.8)
	25-54	25	32.1	(22.5-43.3)
	55-64	15	19.2	(11.8-29.7)
	65+	10	12.8	(7-22.4)
Marital status	Not married	12	15.4	(8.9-25.4)
	Married	46	59	(47.6-69.5)
	Children <13y/o	20	25.6	(17.1-36.6)
Citizenship	Citizen	77	98.7	(91.2-99.8)
	Non-citizen	1	1.3	(0.2-8.8)
Ethnicity	Murut	73	93.6	(85.3-97.3)
	others	5	6.4	(2.7-14.7)
Highest education	No schooling	12	15.4	(8.9-25.4)
	Primary	35	44.9	(34.1-56.2)
	Secondary	15	19.2	(11.8-29.7)
	Tertiary	2	2.6	(0.6-9.9)

CONTINUE

Table III: Characteristics of Respondents Who Utilised Outpatient Healthcare. (CONT.)

Characteristics		Frequency	%	(95% CI)
Highest education	Children <7y/o	14	17.9	(10.8-28.2)
Employment	Employed	6	7.7	(3.5-16.3)
	Self employed	29	37.2	(27.1-48.6)
	Not working	43	55.1	(43.8-65.9)
Living arrangement	With others	78	100	
	Alone	0	-	-
Socioeconomic quintile	Poorest	21	26.9	(18.1-38)
	2	12	15.4	(8.9-25.4)
	3	10	12.8	(7-22.4)
	4	19	24.4	(16-35.3)
	Richest	16	20.5	(12.9-31.1)
Income recipient	No	29	37.2	(27.1-48.6)
	Yes	49	62.8	(51.4-72.9)
Supplementary health coverage	No	62	79.5	(68.9-87.1)
	Yes	16	20.5	(12.9-31.1)
Usual payer for health care	Self only	55	70.5	(59.3-79.7)
	Government/employer	23	29.5	(20.3-40.7)
Barrier to health care in the last 12 months	Ill & seek treatment	70	89.7	(80.6-94.8)
	Ill but did not seek treatment	8	10.3	(5.2-19.4)
	Did not need health treatment	0	-	-
Self-assessed health	Very good	37	47.4	(36.5-58.6)
	Good	24	30.8	(21.4-42)
	Moderate/Not good	17	21.8	(13.9-32.5)
	Very Bad		0	(0-0)
Health limitation	Severe/unable to perform	3	3.8	(1.2-11.4)
	moderate/mild	44	56.4	(45.1-67.1)
	None	31	39.7	(29.4-51.1)
Disease history	Not diagnosed	38	48.7	(37.7-59.9)
	Diagnosed with 1	20	25.6	(17.1-36.6)
	Diagnosed with more than 1	20	25.6	(17.1-36.6)
Smoking status	Never smoke	50	64.1	(52.7-74.1)
	Light smokers	9	11.5	(6.1-20.9)
	Moderate to heavy	5	6.4	(2.7-14.7)
	NA (child <7y/o)	14	17.9	(10.8-28.2)
Alcohol intakes	Never drink alcohol	32	41	(30.5-52.4)
	Once a month	8	10.3	(5.2-19.4)
	2-4 times/month	20	25.6	(17.1-36.6)
	More than 4 times/month	4	5.1	(1.9-13.1)
	NA (child <7y/o)	14	17.9	(10.8-28.2)

The results of the logistic regression analysis for outpatient healthcare utilisation are shown in Table VI. In the univariate analysis, variables with a significant association with a greater likelihood of using outpatient services in the past two weeks were age, marital status, employment, self-assessed health, health limitation (how they coped with daily work or routine), disease history

(ten diseases), and alcohol intakes. In the final model, the variables' highest level of education, socioeconomic quintile, usual payer for health care, self-assessed health, health limitations, disease history, and alcohol consumption were included. Each variable was classified as predisposing (highest education, socioeconomic quintile), enabling (usual payer for health care), need

(self-assessed health, health limitations, disease history), factors. and behavioural (smoking and alcohol consumption)

Table VI: Logistic Regression Analysis for Outpatient Healthcare Utilisation

Variables	Crude OR	95% CI		P value	Adjusted OR	95% CI		P value
		LL	UL			LL	UL	
Predisposing Factors								
Sex								
Male (ref)	ref			-				
Female	1.045	0.641	1.706	0.859				
Age								
Less than 14	0.181	0.079	0.414	0.000				
15-24	0.129	0.046	0.365	0.000				
25-54	0.252	0.112	0.566	0.001				
55-64 (ref)	ref	ref	ref	ref				
65+	0.632	0.226	1.765	0.381				
Marital status								
Not married (ref)	ref			-				
Married	2.396	1.454	3.946	0.001				
Citizenship								
Citizen	ref			-				
Non-citizen	0.299	0.04	2.30	0.246				
Ethnicity								
Murut (ref)	ref			-				
Others	1.628	0.667	3.970	0.284				
Highest education								
No schooling	2.414	1.104	5.281	0.027	0.780	0.300	2.020	0.604
Primary (ref)	ref			-	ref			
Secondary	0.717	0.373	1.378	0.318	0.520	0.240	1.120	0.093
Tertiary	0.483	0.108	2.161	0.341	0.310	0.050	1.900	0.205
Employment								
Employed	0.817	0.327	2.040	0.665				
Self employed	2.304	1.344	3.951	0.002				
Not working (ref)	ref			-				
Living arrangement [#]								
Alone				-				
With others (ref)				-				
Socioeconomic quintile								
Poorest (ref)	ref			-	ref			
2	0.564	0.259	1.229	0.149	0.660	0.250	1.770	0.411
3	0.457	0.202	1.037	0.061	0.510	0.190	1.370	0.181
4	0.971	0.481	1.962	0.935	1.220	0.510	2.910	0.656
Richest	0.806	0.389	1.671	0.562	0.800	0.280	2.310	0.678
Enabling Factors								
Income								
No	0.810	0.489	1.341	0.413				
Yes (ref)	ref			-				
Health coverage								
No (ref)	ref			-				
Yes	0.952	0.518	1.748	0.874				

CONTINUE

Table VI: Logistic Regression Analysis for Outpatient Healthcare Utilisation. (CONT.)

Variables	Crude OR	95% CI		P value	Adjusted OR	95% CI		P value
		LL	UL			LL	UL	
Enabling Factors								
Usual payer for health care								
Self only (ref)	ref			-	ref			
Government/employer	1.464	0.847	2.528	0.172	1.310	0.640	2.700	0.456
Barrier to health care [#]								
Ill & seek treatment (ref)				-				
Ill & did not seek treatment				-				
Did not need health treatment				-				
Health Needs								
Self-assessed health								
Very good (ref)	ref			-	ref			
Good	3.005	1.675	5.392	0.000	1.860	0.380	9.130	0.447
Moderate/not good/very Bad	5.806	2.826	11.926	0.000	0.650	0.230	1.840	0.417
Health limitation								
Severe/unable to perform	2.402	0.635	9.077	0.196	1.860	0.250	14.100	0.547
Moderate/mild	5.098	3.015	8.621	0.000	7.600	1.990	29.040	0.003
None (ref)	ref			-	ref			
Disease history								
Not diagnosed (ref)	ref			-	ref			
Diagnosed with 1	2.962	1.597	5.495	0.001	2.630	1.220	5.660	0.013
Diagnosed with more than 1	6.866	3.431	13.739	0.000	6.770	2.680	17.090	0.000
Behaviour Factors								
Smoking status								
Never smoke (ref)	ref			-				
Light smokers	0.573	0.271	1.211	0.145				
Moderate to heavy	0.841	0.310	2.281	0.733				
Alcohol intakes [*]								
Never drink alcohol (ref)	ref			-	ref			
Once a month	3.478	1.366	8.859	0.009	2.510	0.820	7.720	0.108
2-4 times/month	1.570	0.874	2.822	0.132	1.000	0.480	2.110	0.993
More than 4 times/month	1.507	0.479	4.744	0.483	0.430	0.100	1.840	0.257

Notes:
 1. R-square = 11.3%; Area under ROC curve = 75.1%; Hosmer-Lemeshow test, p-value = 0.170
 2. ref: reference group; OR: odds ratio; CI: confidence intervals; LL: lower limit; UL: upper limit
 3.*Omitted because of collinearity. 3. * Significant at P ≤ 0.05

Need factors were the only factors significant to outpatient care utilisation. For the health limitation factor, those who rated their health limitation as moderate or mild were eight times (AOR = 7.6, 95% CI = 1.990, 29.040) more likely to utilise outpatient care than those who rated their health limitation as not present.

Disease history is also a significant factor for outpatient care, with those diagnosed with a disease being three times (AOR = 2.630, 95% CI = 1.220, 5.660) and those diagnosed with multiple diseases being seven times (AOR = 6.770, 95% CI = 2.680, 17.090) more likely to utilise outpatient care, respectively.

DISCUSSION

Sabah, once a British colony, became part of Malaysia in 1963 and has since witnessed substantial health improvements. However, an early disparity in healthcare facility distribution, particularly noticeable in rural areas, and remains a challenge (7). Despite the urbanisation rate in Sabah increasing to 38% from 17% in the early 1970s, rural residents continue to heavily rely on publicly funded health facilities, with over 66% of visits to public healthcare facilities made by the poorest half of the population (2,29). While there were some improvements in rural healthcare infrastructure

from 2004 to 2014, the doctor-to-population ratio in 2014 (0.74) remained notably lower in Sabah compared to the national average (30). Despite maintaining a 6.1% economic growth rate, Sabah still experiences a lower overall income level, with a GDP per capita of RM19,734, the third lowest in Malaysia (10). It was estimated that nearly one-fifth of the population lived below the poverty line, the highest among states, posing significant challenges for rural populations in accessing healthcare services when needed.

Sabah is geographically divided into five administrative divisions, further segmented into 26 districts. In 2004, Nabawan, situated in southern Sabah, recorded the highest poverty rate at 70.8%, a figure that decreased to 35.6% by 2019 (31,32). Nabawan spans an expansive 6,089 km² and shares borders with Tongod and Tawau to the east, as well as Tenom and Keningau to the west and Indonesia's Kalimantan to the south.

As of 2020, Nabawan's population was 32,309, yielding a density of five people per km² and an average household size of 5.3 (33). Four health clinics and two rural clinics, all of which are exclusive to Nabawan, serve the majority of the population's healthcare needs (31). These facilities offer a comprehensive range of services, from ambulatory care to basic treatments. However, for inpatient and specialised care, residents must turn to Keningau Hospital, approximately 70 kilometres away from Nabawan's clinics, as the nearest viable option. Nabawan faces significant challenges in road connectivity compared to other regions in Malaysia. Frequent flooding has severely damaged infrastructure and hindered transportation, making access to essential services and supplies difficult. For instance, the road to Kg Pangaraan in Nabawan was damaged by floods, destroying bridges and necessitating ongoing repairs (34). Emergency interventions, such as using helicopters to deliver aid, are often required. While rural areas across Malaysia encounter difficulties, the disparity is particularly pronounced in remote areas like Nabawan, where geographical and climatic conditions exacerbate infrastructure issues. This geographical context and healthcare infrastructure paint a picture of the region's healthcare landscape, underscoring both the progress made in poverty reduction and the existing challenges in healthcare accessibility.

Examining the correlation between low socioeconomic status and access to social determinants or conditions (e.g., healthy food, good housing, quality education, safe neighbourhoods, freedom from racism, and other forms of discrimination) is crucial (35). People with lower socioeconomic status often face barriers to these essential factors that support health, resulting in poorer health outcomes compared to those who are more economically privileged. Therefore, it becomes imperative to investigate whether access to outpatient services in Nabawan is primarily defined by income or

other enabling factors.

Our study in Nabawan identified key factors influencing outpatient care utilisation, with self-rated health status, health limitations, and the prevalence of chronic diseases serving as crucial indicators of healthcare needs (36). Bennett et al. demonstrated the strong association between self-rated health status and older adults' use of preventive healthcare services in the United States (37). Similarly, Heyden et al. reported higher healthcare utilisation among lower socioeconomic groups in Belgium, particularly those with lower education levels (38).

In addition to self-reported health status, the prevalence of diseases, serving as a proxy for healthcare needs, reflects the evolving health landscape in Sabah. Despite a decline in communicable diseases like malaria and tuberculosis since the 1960s, Sabah still grapples with higher disease rates, especially in areas linked to migration hubs and densely populated urban centres (39). Notably, Nabawan has witnessed a shift towards more recent diagnoses of hypertension and diabetes, mirroring the broader increase in non-communicable diseases in Sabah (40). The study couldn't stratify sub-populations by age categories, but evidence from Gelberg et al. and Anis-Syakira et al. underscores the importance of chronic conditions as predictors of healthcare utilisation, especially among the elderly (21,41). Chronic conditions, often associated with decreased body function, have been identified as common predictors of healthcare utilisation in various studies (42,43).

The utilisation of outpatient healthcare in Nabawan reflects a commendable level of equity, primarily driven by need factors. The significance of self-reported illness data lies in its ability to illuminate the pivotal role of individual perceptions in shaping healthcare-seeking behaviours. People's subjective understanding of their health plays a crucial role in determining when and how they access healthcare services. Furthermore, tracking fluctuations in self-reported illness rates over time offers valuable insights into the dynamic evolution of health awareness within the population.

A compelling correlation is evident between individuals' self-rated health and their level of health literacy (44). This linkage suggests that how individuals perceive their own health is closely intertwined with their ability to access, comprehend, and apply health-related information. Sabah has one of the highest rates of low health literacy in Malaysia, especially in rural areas (12). Sørensen et al.'s definition of health literacy includes the capacity to access, comprehend, evaluate, and apply health-related information (45). Education and health education emerge as pivotal factors that can enhance health literacy. Moreover, the significance of eHealth literacy becomes increasingly crucial,

particularly for individuals facing specific challenges such as lower levels of education, unemployment, advanced age, and limited income. In this digital age, where technology plays a central role in disseminating health information, having adequate eHealth literacy is essential for navigating online resources, understanding health-related content, and making informed decisions about one's well-being (46).

Understanding the significant influence of individuals' self-perceived health status on healthcare utilisation is crucial for anticipating future healthcare demands. This awareness guides strategic planning and resource allocation, enabling Sabah's healthcare authorities to meet evolving needs. The rise in non-communicable diseases (NCDs) adds complexity, requiring a comprehensive, integrated approach. A whole-of-society and whole-of-government strategy, involving collaboration across sectors, is essential. Integrating health into all policies creates healthier environments, reducing healthcare burdens (47,48). Community engagement is key for tailored interventions, promoting healthy lifestyles, early disease detection, and preventive care, thus enhancing healthcare system resilience (49).

CONCLUSION

This study provides empirical insights into healthcare service utilisation in rural communities, emphasising the importance of comprehending and addressing complexities to guide healthcare initiatives towards equitable and effective outcomes. The pressing need for customised strategies is underscored, considering existing health challenges and distinctive demographic and sociocultural dynamics. Individuals seek care based on perceived needs, yet persistent gaps in screening and treatment for NCDs may result from patients' limited understanding of healthcare benefits. Advocacy for prevention and emphasis on early treatment are crucial for improving health outcomes and enhancing people's perception of healthcare needs. In terms of policy implications, influencing how illness is perceived in the community is crucial, as it largely determines future care-seeking behaviours for outpatient care.

ACKNOWLEDGEMENT

All authors would like to acknowledge all the village heads and participants for their support and cooperation throughout the data collection.

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