Journal of Racial and Ethnic Health Disparities
https://doi.org/10.1007/s40615-026-03076-x

Acculturation, Social Support, and Healthcare Utilisation Among Indonesian Migrant Workers in Malaysia: A Cross-Sectional Study

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Received: 3 November 2025 / Revised: 3 June 2026 / Accepted: 17 June 2026
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Abstract

Background Equitable healthcare access is a key aspect of health equity, yet migrants face substantial barriers. In Malaysia, migrant workers encounter structural and socio-economic barriers to healthcare. Acculturation and social support may influence healthcare utilisation, but their interrelated role remains unclear. This study examined associations between acculturation, social support, and healthcare utilisation among Indonesian migrant workers in Malaysia, and whether social support was indirectly associated with the relationship between acculturation and healthcare utilisation.

Method A cross-sectional study was conducted in the Klang Valley, Malaysia, from October 2024 to February 2025. Acculturation was measured through language proficiency and social interaction, and social support through friends, family, and third parties. Outpatient healthcare utilisation was self-reported. Associations were analysed using partial least squares structural equation modelling (PLS-SEM).

Results Among 322 respondents, 22.7% utilised outpatient healthcare services, mainly at private facilities with substantial out-of-pocket costs. Language proficiency was associated only with support from friends (β = 0.198, $p = 0.016$), while social interaction showed no association with social support. Social support showed no significant direct or indirect association with outpatient healthcare utilisation. Social interaction was negatively associated with outpatient healthcare utilisation (β = -0.165, $p = 0.019$). Age (β = 0.154, $p = 0.005$), length of stay (β = 0.278, $p = 0.008$), and undocumented status (β = -0.361, $p = 0.005$) were significantly associated with outpatient healthcare utilisation.

Conclusion Acculturation and social support showed limited associations with outpatient healthcare utilisation, as structural barriers remain substantial. Inclusive policies are needed to improve equitable healthcare access among migrant workers.

Keywords Health equity · Healthcare access · Acculturation · Social support · Migrant workers

Introduction

Equitable access to healthcare is a fundamental human right and a key determinant of health [1, 2]. It encompasses both individuals' capacity to perceive, seek, reach, pay for, and engage with care, and the health system's responsibility to provide services that are approachable, acceptable, available, affordable, and appropriate [3]. Access may also be conceptualised as potential access, reflecting opportunities and resources available to obtain care, and realised access, referring to the actual utilisation of services [4, 5]. Despite broad global recognition of these principles, an estimated 4.5 billion people lack access to essential health services [6], with international migrants disproportionately affected due to legal, economic, and social barriers [7, 8].

Migrant workers make up a substantial share of the international migrant population, accounting for 55% of

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Published online: 25 June 2026

the 304 million migrants globally in 2024 [9, 10]. Malaysia is a major destination country in Southeast Asia, hosting approximately 2.4 million documented migrant workers in 2024, representing around 14% of the national workforce [11]. When undocumented migrant workers[1] are included, the total migrant workforce may reach up to 5.5 million [13, 14]. Migrant workers in Malaysia originate from 15 countries, with the largest groups coming from Bangladesh (37.9%), Indonesia (24.5%), and Nepal (15.6%) [11], and are predominantly employed in low- and semi-skilled occupations, primarily in the manufacturing, construction, plantation, agriculture, and services sectors [15].

Migrant workers in Malaysia face multiple structural and socio-economic barriers to accessing healthcare, including high out-of-pocket costs, language barriers, fear of immigration enforcement, xenophobia, and limited employer support [16–18]. Healthcare is delivered through a dual public-private system, in which public services are heavily subsidised for citizens but provided to non-citizens at full cost [19, 20]. Following fee revisions in 2014 [21], charges for outpatient and inpatient care for non-citizens at public facilities are estimated to be 24 to 100 times higher than for citizens [16]. Documented migrant workers are required to enrol in the Foreign Workers Hospitalisation and Surgical Insurance Scheme (SPIKPA) as a condition for annual work permit renewal [22, 23]. However, SPIKPA covers only hospitalisation and surgical care at public facilities, excluding outpatient, mental health, and gynaecological services, and it is not mandatory for workers in the plantation and domestic sectors [23]. In addition, public healthcare personnel are required to report undocumented migrants seeking care to immigration authorities [24].

Socio-environmental factors, particularly acculturation and social support, are determinants of healthcare access among migrants [25, 26]. Acculturation—the process of adapting to the host society's cultural and social norms [27, 28]—may enhance migrants' access to healthcare through longer residence and greater proficiency in local languages [29–31]. Social support—the perceived or actual assistance from social networks [32]—can facilitate access by offering emotional, tangible, and informational resources [33–35], although it may also encourage reliance on informal or alternative care [36, 37].

Despite growing evidence, several gaps remain. Much of the evidence focuses on refugees, asylum seekers [38–41], or ethnic minority populations in high-income settings [42, 43], where structural barriers to healthcare may differ. Studies also tend to examine acculturation and social support in isolation [33, 34, 44, 45], limiting understanding of their influence on healthcare access. Evidence from the COVID-19 pandemic highlights the critical role of social networks in enabling migrants' access to testing, treatment, and vaccination [46, 47]. However, among migrant workers who often face restrictive labour migration policies and structural barriers in accessing healthcare [48, 49], the extent to which acculturation and social support jointly influence healthcare access remains unclear.

Indonesia, a neighbouring country to Malaysia, shares close linguistic, cultural, and religious ties with the host population. Indonesian migrant workers in Malaysia therefore provide a relevant context to address this gap. As the country's second-largest migrant worker group [11, 50], their linguistic and cultural proximity [51, 52] may facilitate acculturation and the formation of social support networks, potentially improving healthcare access. However, they continue to face substantial structural and socio-economic barriers to healthcare [16, 53, 54]. This juxtaposition of socio-environmental facilitators and persistent structural constraints provides a useful context to examine whether acculturation and social support meaningfully influence healthcare access under restrictive conditions [16]. Given the multidimensional nature of healthcare access [3], this study uses healthcare utilisation as an observable indicator of realised access.

This study examines the associations between acculturation, social support, and healthcare utilisation among Indonesian migrant workers in Malaysia, and whether social support is indirectly associated with the relationship between acculturation and healthcare utilisation. Five hypotheses are tested: (i) acculturation is associated with social support, (ii) social support is associated with healthcare utilisation, (iii) acculturation is associated with healthcare utilisation, (iv) social support is indirectly associated with the relationship between acculturation and healthcare utilisation, and (v) sociodemographic factors are associated with healthcare utilisation.

Materials and Methods

Study Design, Setting, and Sample

A cross-sectional study was conducted in the Klang Valley region of Peninsular Malaysia, which has a high concentration of migrant workers [55]. The target population comprised Indonesian migrant workers, both documented and undocumented, who had been employed for at least 12 months in any of the permitted employment sectors (manufacturing, construction, plantation, agriculture, and services), except for domestic work. Migrant domestic

[1] Undocumented migrant worker is defined as a "a migrant who is not authorised to enter, to stay and to engage in a remunerated activity in the state of employment pursuant to the law of that state and to international agreements to which that state is a party" [12].

workers were excluded due to their limited opportunities for social interaction with the broader community, as they are typically employed as full-time, live-in workers in their employers' homes [56]. Given the sensitivity of immigration status and the potential risks of detention or deportation [57], undocumented workers were not specifically targeted and immigration status was not directly collected.

Sample size was determined using two complementary approaches. First, the partial least squares structural equation modelling (PLS-SEM) sample size framework was used to estimate the minimum sample required for testing the structural model [58, 59]. Assuming 80% statistical power, a 5% significance level, an anticipated effect size (R^2) of 0.10, and 10 predictors targeting the endogenous construct, a minimum of 189 respondents was required [59]. Second, a supplementary calculation for descriptive analysis was conducted using OpenEpi software. Based on a population of 594,975 [11, 50], an anticipated healthcare utilisation prevalence of 17.4% [60], a 5% margin of error, a design effect of 1.0, and 95% confidence level, 221 respondents were needed. To account for an anticipated 30% non-response rate, the final sample size was increased to 287, ensuring adequacy for both descriptive statistics and structural model analysis.

A combination of convenience and snowball sampling was used for recruitment, as this approach is pragmatic for engaging vulnerable and hard-to-reach migrant populations in Malaysia [61–63].

Study Constructs and Measures

Acculturation was specified as the independent variable, operationalised through two domains: language proficiency and social interaction. Social support was modelled as an indirect variable, comprising three domains: friends, family, and third parties. Healthcare utilisation was the dependent variable, defined as the utilisation of outpatient healthcare services. Sociodemographic factors were included as control variables.

Data were collected using a five-section self-administered questionnaire covering sociodemographic factors, acculturation, social support, acute health problems, and outpatient healthcare utilisation. Sociodemographic factors included gender, age, province of origin, native language, education, length of stay in Malaysia, employment sector, documentation status, and monthly income. Questions on acute health problems were adopted from the National Health and Morbidity Survey (NHMS) 2019 module on non-communicable diseases, healthcare demand and health literacy. The NHMS is a series of nationwide household health surveys conducted by the Institute for Public Health, Ministry of Health Malaysia [64] and reflects the standard approach for measuring population health status and healthcare utilisation patterns in Malaysia. Acute health problems were defined as self-reported experience of acute conditions within the six months preceding the survey, recorded dichotomously (yes/no). Additional items captured care-seeking actions and barriers to formal healthcare. Measures for acculturation, social support, and outpatient healthcare utilisation are described below.

The questionnaire was reviewed by experts in public health, anthropology, sociology, and labour migration to ensure content relevance and clarity. It was subsequently translated into the Indonesian language using a forward-backward translation procedure [65, 66] by bilingual translators to ensure linguistic accuracy and cultural appropriateness.

Acculturation

Acculturation was measured using the Short Acculturation Scale (SAS) developed by Marin et al. [67] and previously validated for Indonesian migrant workers in Malaysia. The Indonesian version of the SAS retained eight of the 12 original items, which demonstrated excellent content relevance (CVI = 0.80-1.00, Kappa = 0.76-1.00). These items formed three subscales: language preferences for social media (two items), language use in everyday activities (three items), and ethnic preferences in social interactions (three items). Responses were rated on a five-point Likert scale: '1 = only Indonesian/regional language' to '5 = only Malay' for language items, and '1 = all Indonesians' to '5 = all Malaysians' for social interaction items. Exploratory factor analysis confirmed the three-factor structure, explaining 59.8% of total variance. Internal consistency was acceptable (Cronbach's alpha = 0.679–0.816, Spearman-Brown coefficient = 0.732), and test-retest reliability showed excellent stability (ICC = 0.991-1.000, $p < 0.001$) [68]. SAS scores were averaged, with < 2.99 indicating lower acculturation (greater orientation toward the culture of origin) and ≥ 2.99 indicating higher acculturation (greater integration into the host culture) [69].

Social Support

Social support was measured using the Multidimensional Scale of Perceived Social Support (MSPSS) developed by Zimet et al. [70] and also previously validated for Indonesian migrant workers in Malaysia. The Indonesian version of the MSPSS retained all 12 original items with acceptable content relevance (CVI = 0.67-1.00, Kappa 0.56-1.00). The items formed three subscales, each with four items: friends, family, and third parties (including employers, labour union, non-governmental organisations, and the Indonesian embassy). Responses were rated on a five-point Likert

scale: '1 = strongly disagree' to '5 = strongly agree'. Exploratory factor analysis confirmed the three-factor structure, explaining 65% of the total variance. Internal consistency was acceptable (Cronbach's alpha = 0.786–0.916, Spearman-Brown coefficient = 0.779), and test-retest reliability indicated excellent stability (ICC = 0.886-1.000, $p < 0.001$). MSPSS scores were averaged and categorised as low (1.0-2.9), moderate (3.0–5.0), or high (5.1-7.0) perceived support [71].

Outpatient Healthcare Utilisation

Questions on outpatient healthcare utilisation were adopted from the NHMS 2019 [64]. Utilisation was assessed based on self-reported receipt of care—including advice, check-ups, or treatment—at healthcare facilities within the six months preceding the survey. Facilities included private clinics, hospital outpatient departments, emergency units, and day care/ambulatory care centres. Overnight stays and dental services were excluded. Responses were recorded dichotomously (yes/no). Additional questions covered (i) the number of different facilities visited, (ii) type of facility, (iii) reason for visit, (iv) payer for services, (v) out-of-pocket expenses per visit at healthcare facility, including consultation fees, medications, tests, and other related costs, (vi) pharmacy expenses for medications or medical appliances, and (vii) non-pharmacy expenses for medications or medical appliances.

Data Collection and Ethical Consideration

Data were collected over a five-month period, from October 2024 to February 2025, in partnership with two Indonesian migrant workers' community-based organisations (CBOs): *Komunitas Serantau* and *Serikat Buruh Migran Indonesia Malaysia*. Organisation leaders served as enumerators, leveraging their established trust within the community and prior research experience. This partnership enhanced study feasibility and reduced non-response, as enumerators facilitated recruitment, built rapport, and supported respondent engagement throughout data collection.

Respondents were recruited through the enumerators' networks within Indonesian migrant worker communities in the Klang Valley region. Potential respondents were contacted via face-to-face contact, WhatsApp, or telephone. The survey was administered online (REDCap or Google Forms) or in person using paper-based questionnaires, providing flexibility to maximise participation. In-person data collection was conducted in small groups at safe and convenient locations, including respondents' homes, enumerators' residences, or community spaces, and was led by the primary researcher with support from enumerators. A respondent information sheet outlining the study and respondents' rights was provided. Written informed consent was obtained, while for respondents with limited literacy, information was delivered verbally and verbal consent was documented. Each respondent received RM10 (USD 2) as a token of appreciation.

Ethical approval was obtained from the Universiti Malaya Research Ethics Committee (Non-Medical) (Reference number: UM.TNC2/UMREC_3136). All procedures followed the ethical principles outlined in the 1964 Declaration of Helsinki and its subsequent amendments. Participation was voluntary, and respondents could withdraw at any time without consequence or loss of benefits. Confidentiality and anonymity were strictly maintained. No identifiable personal information, such as full names or phone numbers, was collected, and each respondent was assigned a numerical code for data entry and management.

Data Analysis

Descriptive statistics were calculated using IBM SPSS Statistics (Version 29) to summarise respondents' sociodemographic details and key study variables. Results are presented as frequencies, percentages, means (M), and standard deviations (SD).

PLS-SEM was conducted using SmartPLS software (Version 4.1.1.2) to explore associations among latent constructs, including indirect effects of social support. PLS-SEM was selected for its suitability for exploratory models, robustness with moderate sample sizes, and capacity to estimate complex structural relationships [58]. Analysis involved two phases. First, the measurement model was evaluated for convergent validity (outer loadings ≥ 0.70, Cronbach's alpha > 0.70, composite reliability (CR) > 0.70, and average variance extracted (AVE) > 0.50) and discriminant validity (Fornell-Larcker criterion, heterotrait-monotrait ratio (HTMT) < 0.85, and cross-loadings). Second, the structural model was assessed using bootstrapping with 5,000 resamples and two-tailed significance testing to examine path coefficients and determine the strength and direction of associations, controlling for sociodemographic variables. Indirect effects of social support were evaluated using the same bootstrapping procedure, with statistical significance determined by 95% confidence intervals [72, 73].

Results

A total of 365 responses were collected, of which 322 were retained after data cleaning. Exclusions included 12 non-Indonesian respondents, eight duplicates, and 23 incomplete responses. Missing data were minimal (0.67%) and were

addressed using simple imputation methods (mean for continuous variables, median for ordinal variables, and mode for categorical variables), which are considered appropriate when the proportion of missing data is very small [74].

Respondents' Sociodemographic Profile

Of the 322 respondents, 50.6% were male and 49.4% were female, with a mean age of 37 years (SD = 9.38). Most originated from East Java (38.8%), were native Javanese speakers (59.9%), and had completed high school or vocational education (59.3%). The majority were documented workers (80.4%) and employed in the services sector (42.9%). On average, respondents had lived in Malaysia for nine years (SD = 6.95), with a mean monthly income of RM1,768.70 (USD 453, SD = 431.38) (Table 1).

Table 1 Respondents' sociodemographic profile (I = 322)

Variable	Category	N	%
Gender	Male	163	50.6
	Female	159	49.4
Province of origin	East Java	125	38.8
	Central Java	66	20.5
	West Java	43	13.4
	Other provinces	88	27.3
Native language	Javanese	193	59.9
	Sundanese	26	8.1
	Madurese	24	7.5
	Other languages	79	24.5
Education	No formal schooling	1	0.3
	Primary school	39	12.1
	Junior high school	86	26.7
	High school/Vocational school	191	59.3
	Diploma or higher	5	1.6
Employment sector	Manufacturing	34	10.6
	Construction	60	18.6
	Plantation	81	25.2
	Agriculture	9	2.8
	Services	138	42.9
Documentation status	Documented	259	80.4
	Possibly undocumented	63	19.6
Variable		M	SD
Age (years)		37.09	9.38
Length of stay in Malaysia (years)		8.96	6.95
Monthly income (RM)		1768.70	431.38

Documentation status was proxied using respondents' self-reported employment type (formal or informal). Those employed by a registered employer were considered formal and likely documented, while self-employed or freelance workers were considered informal and potentially undocumented. Direct questioning was avoided to minimise legal risks associated with undocumented status [75]

M mean, *SD* standard deviation

Level of Acculturation and Social Support

Respondents reported a low level of acculturation (M = 2.72, SD = 0.65). Among the subscales, language use in everyday activities had the highest score (M = 3.09, SD = 0.85), followed by language preferences for social media (M = 2.64, SD = 0.93) and ethnic preferences in social interactions (M = 2.54, SD = 0.75). Perceived social support was moderate overall (M = 3.59, SD = 0.62). Support from third parties recorded the highest score (M = 3.81, SD = 0.78), followed by friends (M = 3.55, SD = 0.69) and family (M = 3.54, SD = 0.71) (Table 2).

Prevalence of Acute Health Problems and Outpatient Healthcare Utilisation

Among 322 respondents, 28.3% reported experiencing acute health problems within the six months preceding the survey. Of these, the majority (82.4%) sought professional medical care. The remaining 17.6% did not seek professional care, most commonly due to the perception that the illness was mild. Other reasons for not seeking professional care included financial hardship, lack of information on available services, time constraints, and documentation or communication difficulties.

Outpatient healthcare utilisation was low, with only 22.7% of respondents utilising these services during the same period. Most visits were to private healthcare facilities (91.8%), typically involved a single facility (74%), and were primarily for acute health problems (93.2%). The majority paid out-of-pocket (84.9%), with mean expenses per visit of RM145.82 (USD 37, SD = 139.73). Additional spending on medications or medical appliances was reported, with pharmacy expenses averaging RM51.47 (USD 13, SD = 54.98) and non-pharmacy expenses averaging RM37.33 (USD 9, SD = 46.25) (Table 3).

Table 2 Respondents' levels of acculturation and social support (*N* = 322)

Instrument	Subscale/Category	M	SD
Indonesian version of the SAS	Overall score	2.72	0.65
	Language preferences for social media	2.64	0.93
	Language use in everyday activities	3.09	0.85
	Ethnic preferences in social interactions	2.54	0.75
Indonesian version of the MSPSS	Overall score	3.59	0.62
	Friends	3.55	0.69
	Family	3.54	0.71
	Third parties	3.81	0.78

M = mean, SD = standard deviation

Table 3 Respondents' outpatient healthcare utilisation patterns ($N=73$)

Variable	Category	*N*	%
Number of facilities visited	1 facility	54	74.0
	2 facilities	12	16.4
	3 or more facilities	7	9.6
Type of facility	Government	6	8.2
	Private	67	91.8
Reason for visit	Acute health problems	68	93.2
	Follow-up care	5	6.8
Payer for services	Personal funds	62	84.9
	Employer/panel clinic	7	9.6
	Other sources	4	5.5
Variable		**M**	**SD**
Out-of-pocket expenses per visit at healthcare facility (RM)		145.82	139.73
Pharmacy expenses (RM)		51.47	54.98
Non-pharmacy expenses (RM)		37.33	46.25

Out-of-pocket expenses per visit at healthcare facility referred to the total amount paid to the healthcare facility, including consultation fees, medications, tests, and other related costs

Pharmacy and non-pharmacy expenses referred to the total amount spent on medications or medical appliances purchased from pharmacy shops or non-pharmacy shops (e.g. general stores or convenience shops) on the advice of a healthcare practitioner within the six months preceding the survey

M = mean, SD = standard deviation

PLS-SEM Analysis

Measurement Model

Five indicators (two from language proficiency, two from friends, and one from family) had outer loadings below 0.40 and were therefore removed, as such low loadings do not meaningfully contribute to construct reliability or convergent validity [72]. Following their removal, the reliability and convergent validity of the corresponding constructs improved, and the remaining indicators demonstrated satisfactory reliability (Cronbach's alpha > 0.70, CR > 0.70) and convergent validity (AVE > 0.50) (Table 4).

Discriminant validity was established using three criteria. First, the square root of the AVE for each construct exceeded its correlations with other constructs, satisfying the Fornell-Larcker criterion. Second, all HTMT ratios ranged from 0.018 to 0.680, below the recommended threshold of 0.85. Third, cross-loadings analysis showed that each indicator loaded higher on its intended construct than on other constructs. Detailed results are provided in Supplementary Information (SI) 1.

Structural Model

Multicollinearity among constructs was examined using the variance inflation factor (VIF). All VIF values ranged from 1.17 to 1.99, well below the recommended threshold of 5.0 [72], indicating that multicollinearity was not a concern.

Path coefficients and significance statistics for hypothesis testing are presented in Table 5. For the associations between acculturation and social support constructs, language proficiency was significantly associated with support from friends ($\beta=0.198$, $p=0.016$), but not with support from family ($\beta = -0.082$, $p=0.362$) or third parties ($\beta = -0.105$, $p=0.336$). Social interaction did not show a significant association with any social support constructs: friends ($\beta=0.017$, $p=0.859$), family ($\beta = -0.078$, $p=0.399$), and third parties ($\beta=0.053$, $p=0.628$). The direct associations between social support constructs and outpatient healthcare utilisation were not statistically significant: friends ($\beta=0.037$, $p=0.673$), family ($\beta = -0.009$, $p=0.912$), and third parties ($\beta = -0.037$, $p=0.707$). For the associations between acculturation constructs and outpatient healthcare utilisation, social interaction showed a small but significant negative association ($\beta = -0.165$, $p=0.019$), while language proficiency was not significantly associated ($\beta = -0.011$, $p=0.898$).

Among the sociodemographic variables, age ($\beta=0.154$, $p=0.005$), length of stay in Malaysia ($\beta=0.278$, $p=0.008$), and documentation status ($\beta = -0.361$, $p=0.005$) were significantly associated with outpatient healthcare utilisation. In contrast, education ($\beta = -0.020$, $p=0.738$), employment sector ($\beta = -0.041$, $p=0.535$), and monthly income ($\beta = -0.079$, $p=0.378$) showed no significant association.

Indirect effect analysis indicated that none of the social support constructs had any significant indirect effect on the associations between acculturation constructs and outpatient healthcare utilisation. The indirect effects for language proficiency through friends ($\beta=0.007$, $p=0.693$), family ($\beta=0.001$, $p=0.940$), and third parties ($\beta=0.004$, $p=0.768$),

Table 4 Outer loadings and internal consistency reliability of the study constructs

Construct	No. of indicator	No. of excluded indicator	Outer loading	Cronbach's alpha	CR	AVE
Language proficiency	5	2	0.842–0.913	0.862	0.915	0.782
Social interaction	3	0	0.849–0.909	0.849	0.907	0.764
Friends	6	2	0.747–0.921	0.864	0.895	0.683
Family	4	1	0.796–0.904	0.830	0.899	0.748
Third parties	2	0	0.849–0.957	0.795	0.900	0.818

CR composite reliability, *AVE* average variance extracted.

Table 5 Path coefficients and significance statistics of the study constructs

Path	β	SE	t-value	*p*- value	(95% CI β)	
					LL	UL
IVs -> InVs						
Language proficiency -> Friends	0.198	0.082	2.415	0.016*	0.030	0.353
Language proficiency -> Family	-0.082	0.090	0.912	0.362	-0.252	0.101
Language proficiency -> Third parties	-0.105	0.109	0.963	0.336	-0.272	0.146
Social interaction -> Friends	0.017	0.094	0.178	0.859	-0.179	0.183
Social interaction -> Family	-0.078	0.092	0.843	0.399	-0.259	0.103
Social interaction -> Third parties	0.053	0.110	0.485	0.628	-0.188	0.232
InVs -> DV						
Friends -> Outpatient care	0.037	0.088	0.422	0.673	-0.142	0.203
Family -> Outpatient care	-0.009	0.079	0.110	0.912	-0.175	0.131
Third parties -> Outpatient care	-0.037	0.098	0.376	0.707	-0.224	0.157
Direct association IVs -> DV						
Social interaction -> Outpatient care	-0.165	0.071	2.338	0.019*	-0.308	-0.029
Language proficiency -> Outpatient care	-0.011	0.082	0.128	0.898	-0.172	0.154
CVs -> DV						
Age -> Outpatient care	0.154	0.055	2.822	0.005*	0.044	0.260
Education -> Outpatient care	-0.020	0.059	0.334	0.738	-0.134	0.096
Length of stay -> Outpatient care	0.278	0.104	2.673	0.008*	0.062	0.464
Employment sector -> Outpatient care	-0.041	0.066	0.621	0.535	-0.163	0.097
Documentation status -> Outpatient care	-0.361	0.051	2.828	0.005*	-0.235	-0.041
Monthly income -> Outpatient care	-0.079	0.090	0.882	0.378	-0.246	0.107

β standardised coefficient beta, *SE* standard error, *CI* confidence interval, *LL* lower limit, *UL* upper limit, *IVs* independent variables, *InVs* indirect variables, *DV* dependent variable, *CVs* control variables

*Significant at $p<0.05$

as well as for social interaction through friends (β = 0.001, $p=0.948$), family (β = 0.001, $p=0.949$), and third parties (β = -0.002, $p=0.859$), were not statistically significant. All 95% bootstrapped confidence intervals included zero (Table 6).

The explanatory power of the structural model was evaluated using the coefficient of determination (R^2), effect sizes (f^2), and predictive relevance (Q^2). The model explained 17.5% of the variance in outpatient healthcare utilisation ($R^2=0.175$), indicating modest explanatory power (Fig. 1). The effect sizes of the predictor variables were small ($f^2=<0.001$–0.053), with length of stay contributing the largest effect ($f^2=0.053$). Predictive relevance, assessed using the blindfolding procedure, indicated adequate predictive relevance for outpatient healthcare utilisation ($Q^2 = 0.103$).

Discussion

While socio-environmental factors are important determinants of healthcare utilisation among migrants [33–35, 76, 77], this study found only partial support for the hypothesised relationships between acculturation, social support, and outpatient healthcare utilisation among Indonesian migrant workers in Malaysia.

Acculturation, measured through language proficiency and social interaction, was partially associated with social support. Language proficiency was significantly associated only with friend-based support, suggesting that language skills facilitate peer connections. This aligns with previous studies indicating that language competence supports social acceptance and the maintenance of supportive peer networks in both professional and everyday contexts [78–80]. In

Table 6 Indirect effects of social support constructs

Path	β	SE	t-value	*p*-value	(95% CI β)	
					LL	UL
Language proficiency -> Friends -> Outpatient care	0.007	0.019	0.394	0.693	-0.028	0.048
Language proficiency -> Family -> Outpatient care	0.001	0.01	0.075	0.940	-0.019	0.022
Language proficiency -> Third parties -> Outpatient care	0.004	0.013	0.295	0.768	-0.023	0.032
Social interaction -> Friends -> Outpatient care	0.001	0.009	0.065	0.948	-0.023	0.019
Social interaction -> Family -> Outpatient care	0.001	0.011	0.064	0.949	-0.017	0.028
Social interaction -> Third parties -> Outpatient care	-0.002	0.011	0.177	0.859	-0.026	0.022

β = standardised coefficient beta, *SE* standard error, *CI* confidence interval, *LL* lower limit, *UL* upper limit

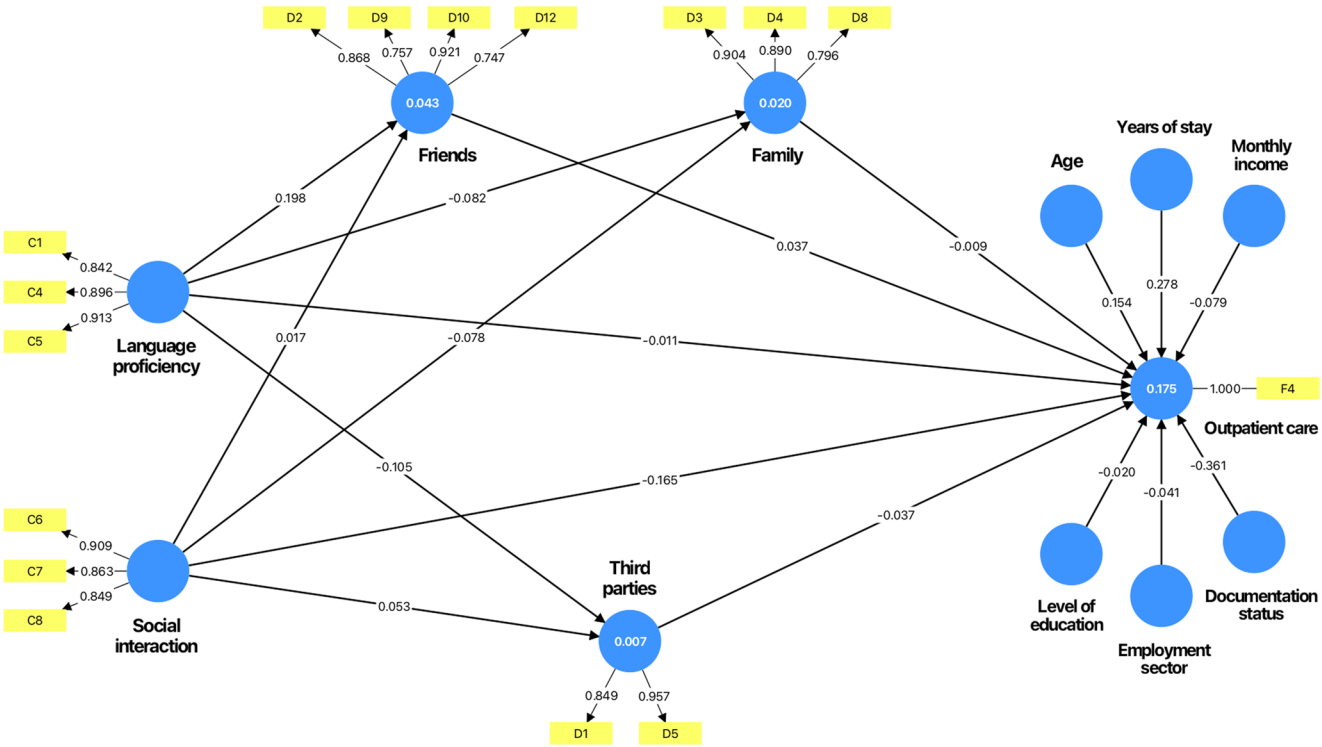


Fig. 1 PLS-SEM structural model illustrating the associations between acculturation, social support, and outpatient healthcare utilisation. Note. The alphanumeric codes (i.e., C1-C8, D1-D12, F4) refer to the questionnaire items used for data entry. The letters (C, D, F) indicate questionnaire sections, and the numbers indicate the items order within each section

contrast, social interaction showed no significant association with any form of social support, which may reflect discrimination and negative public perceptions faced by migrant workers in Malaysia [81], potentially limiting the development of meaningful or supportive relationships through social engagement, including with the host population.

Contrary to the hypotheses, none of the social support constructs showed a significant direct or indirect association with outpatient healthcare utilisation. This suggests that, although migrants may have supportive social networks, broader structural vulnerabilities, including high healthcare costs, limited entitlement to healthcare, and fear of legal consequences [49, 82], may constrain the practical utility of social support in facilitating access to healthcare. In more migrant-inclusive healthcare systems, such as those in high-income countries, social support has been shown to facilitate healthcare navigation, including practical assistance such as arranging transport or scheduling appointments [34, 77].

Acculturation was also partially associated with outpatient healthcare utilisation. Language proficiency showed no significant association, contrasting with prior studies in other settings that emphasise its role in facilitating care-seeking among migrants [29, 30, 35]. One explanation may be the linguistic proximity between Malay and Indonesian [83, 84], which may reduce communication barriers and diminish the role of language in this context. In contrast, social interaction was negatively associated with outpatient healthcare utilisation. This counterintuitive finding may reflect greater reliance on informal or alternative care, including advice, self-medication, or traditional remedies, encouraged by social networks rather than formal healthcare services [36, 37]. It may also indicate underlying distrust of the Malaysian healthcare system or concerns related to immigration enforcement [16–18].

Sociodemographic factors showed expected associations, with age and length of stay in Malaysia positively associated with outpatient healthcare utilisation. These patterns likely reflect greater familiarity with the healthcare system over time and increasing health needs with age [31, 85, 86]. In contrast, undocumented status was associated with significantly lower utilisation, likely due to fear of detention and deportation, particularly when healthcare facilities are perceived as sites of immigration surveillance or enforcement [16, 87].

Taken together, these findings highlight that socio-environmental factors alone are insufficient to improve healthcare utilisation among migrant workers in Malaysia, given the persistence of structural barriers. Inclusive healthcare policies are therefore essential to ensure equitable access. This could be advanced through multi-sector collaboration by building on public-private partnership models implemented during Malaysia's COVID-19 response, including

mobile clinics and targeted vaccination programmes, that enabled safer access for migrants, particularly those undocumented [46, 88]. Expanding the SPIKPA scheme to include outpatient and preventive services may further promote timely care-seeking [22, 23]. Complementary interventions should leverage trusted peer networks to disseminate accurate information, build confidence in the healthcare system, and reduce reliance on informal or alternative care. Thailand's migrant health worker programmes offer a useful model of how peer-based approaches can support health promotion and improve service navigation among migrant communities [89, 90].

The study has several strengths, notably the use of culturally adapted and validated instruments (SAS and MSPSS) and the engagement of CBOs to facilitate access to a hard-to-reach migrant population in Malaysia [63]. Nonetheless, several limitations warrant consideration. First, the cross-sectional design precludes causal inference. All indirect effect estimates are exploratory and associational in nature, temporal ordering among variables cannot be established, and alternative causal structures remain equally plausible. Second, the focus on Indonesian migrant workers in the urban Klang Valley limits the generalisability of findings to migrant populations of other nationalities or those residing in less-resourced settings. Third, the use of convenience and snowball sampling, while necessary to facilitate participation, may have introduced selection bias by overrepresenting individuals with stronger social networks. However, collaboration with CBOs enabled the inclusion of likely undocumented respondents, partially mitigating this limitation. Fourth, reliance on self-reported data introduces the potential for recall and social desirability bias. Finally, healthcare access was measured solely through service utilisation, thereby providing a partial assessment that does not capture other key dimensions, such as acceptability, availability, and quality of care [3].

Future research should adopt longitudinal designs and include more diverse migrant worker populations to better understand causal pathways and enhance generalisability. Studies incorporating multidimensional measures of healthcare access and mixed-method approaches could provide deeper insights into the barriers and facilitators of healthcare access among migrant workers.

Conclusion

This study contributes to the migrant health equity literature by demonstrating that, among Indonesian migrant workers in Malaysia, acculturation and social support alone are insufficient to improve healthcare utilisation, as structural barriers—particularly documentation status—remain significant. Addressing systemic barriers through inclusive healthcare delivery policies is therefore essential to ensure equitable access to healthcare for this population.

Author Contributions Conceptualisation: Amirah Zafirah Zaini; Methodology: Amirah Zafirah Zaini, Mahmoud Danaee; Formal analysis: Amirah Zafirah Zaini, Mahmoud Danaee; Writing - original draft preparation: Amirah Zafirah Zaini; Writing - review and editing: Tharani Loganathan, Mahmoud Danaee, Hazreen Abdul Majid; Supervision: Tharani Loganathan, Mahmoud Danaee, Hazreen Abdul Majid.
All authors read and approved the final manuscript.

Funding Open access funding provided by The Ministry of Higher Education Malaysia and Universiti Malaya. This research was funded by the Universiti Malaya Matching Grant-International awarded to Tharani Loganathan under grant number MGIF009-2025. The funder had no role in the study design, data collection and analysis, decision to publish, or preparation of the manuscript.

Data Availability All data relevant to the study are included in the article or provided as supplementary information. Due to ethical constraints and to protect respondent confidentiality, the full dataset is not publicly available. However, access to the data may be requested from the Universiti Malaya Research Ethics Committee, Research Services Division, Research and Innovation Management, Universiti Malaya, 50603 Kuala Lumpur Malaysia (email: umrec@um.edu.my), under reference number UM.TNC2/UMREC_3136.

Declarations

Competing interests The authors have no relevant financial or non-financial interests to disclose.

Ethics Approval This study obtained ethical approval from the Universiti Malaya Research Ethics Committee (Non-Medical) (Reference number: UM.TNC2/UMREC_3136). The study was performed in accordance with the 1964 Declaration of Helsinki.

Consent to Participate Informed consent was obtained from all respondents prior to data collection.

Consent to Publish Not applicable.

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