Unmet Healthcare Needs and Related Factors Among Immigrants: A Cross-Sectional Secondary Analysis of 2019 Korea Community Health Survey Data

INQUIRY: The Journal of Health Care Organization, Provision, and Financing
Volume 60: 1–9

DOI: 10.1177/00469580221146828
journals.sagepub.com/home/inq
SAGE

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Abstract

Immigrants in Korea face numerous difficulties in seeking medical services due to language and cultural differences. Providing medical services to them could be beyond the institutional capacity of the host country owing to factors such as, physical and psychological problems, social unrest, language barriers, and problems adapting to unfamiliar environments. According to Andersen's health service use behavioral model, we used a multifaceted approach to explore the factors influencing the unmet healthcare needs of immigrants in Korea from the Korean health system. This cross-sectional secondary analysis study used data from the 2019 Korea Community Health Survey of 3524 immigrants. Their unmet healthcare needs were calculated using a complex, weighted sample design. Group differences in categorical variables were analyzed using the Rao-Scott chi-square test. Logistic regression analysis was used to analyze the association between unmet healthcare needs and ageing factors. Overall, 262 (7.4%) of surveyed immigrants experienced unmet healthcare needs. Factors influencing unmet healthcare needs were being a woman (OR = 1.41, 95% CI = 1.03-1.94), national primary livelihood security receiver (OR = 1.44, 95% CI = 1.29-1.68), stress (OR = 1.34, 95% CI = 1.26-1.45), perceived health status (poor: OR = 2.35, 95% CI = 1.58-3.52), and perceived health status (moderate: OR = 1.62, 95% CI = 1.18-2.20). Policymakers could focus on these predictors when formulating policy strategies to reduce unmet health care needs. In addition, by effectively delivering services that meet the unmet healthcare needs of immigrants, their right to health is protected.

Keywords

health services accessibility, healthcare disparities, assessment of health care needs, immigrants, national survey

What do we already know about this topic?
Immigrants in Korea can be placed outside the institutional capacity of the host country for medical use due to physical and psychological problems, social unrest, language barriers, and problem adapting to an unfamiliar environment.

How does your research contribute to the field?
Women, national primary livelihood security receiver, perceived stress, and perceived health status influenced the unmet healthcare needs in immigrants in Korea.

What are your research's implications toward theory, practice, or policy?
When formulating policy strategies to reduce unmet health care needs, focus should be placed on social and psychological factors, personal, environmental, and institutional factors.

Introduction

Due to an increase in international marriages and an influx of foreign workers and students, the proportion of foreigners in Korea's total population is steadily increasing. The ratio of immigrants to the total population in Korea has been increasing yearly, from 0.56% in 2009 to 3.69% in 2015 to 4.87% in 2019; however, it reduced to 3.98% in 2020 due to the impact of coronavirus disease 2019 pandemic.[1] Moreover, considering immigrants in Korea live in an unfamiliar environment, they are more likely to experience physical and mental health problems, compared to natives. Therefore, a careful approach is required to respond to health problems in a multicultural context.[2]

Korea's universal healthcare system has contributed significantly to the population's health status, achieving one of

the lowest spending levels by patients on healthcare services among Organization for Economic Cooperation and Development (OECD) member countries through low patient co-payments and a national health insurance system.[3,4] Nevertheless, the burden of medical expenses and difficulties in communication leaves most immigrants with limited access to medical and health services.[5] However, this problem is not unique to Korea; in other countries, such as Canada, it has been reported that immigrants lack equal and sufficient access to medical services.[6] Unmet healthcare needs occur when a patient wants medical care or a healthcare professional determines it is necessary but does not receive medical care assistance.[7]

The difficulty in meeting these medical expenses can aggravate a person's symptoms and conditions. Additionally, the possibility of complications, extended hospitalization periods, and higher medical costs increases.[8] This means that unmet healthcare needs can lead to more severe health consequences for individuals and society, such as associated diseases and cost burdens; therefore, it is essential to identify these factors. Moreover, unmet healthcare needs may increase depression and further diminish quality of life.[9] Therefore, equitably ensuring access to health services should be prioritized.

The fifth National Health Plan 2030 of Korea acknowledges that differences in income contribute to differences in health and that the number of medically vulnerable groups is expected to increase.[10] Some studies have examined patients with children, island residents, low-income older adults living alone, and married migrant women.[3,11,12] Other researchers have examined the health management policies and unmet healthcare needs for married immigrant women,[12] older adults,[3,13] and persons with disabilities.[14] Certain reports published abroad have suggested that approximately 2.5% of the 27 member countries of OECD have unmet healthcare needs.[15] The reasons provided for these unmet healthcare needs varied across countries, including financial reasons (Poland, Portugal, Greece, and Italy), waiting period (Poland, Finland, and Estonia), and transportation difficulties (Norway). Ensuring access to healthcare when needed, rather than the ability to pay, is one of the more important ways to improve the quality of care available to people.[16] Therefore, as an indicator of limited access to or availability of medical care, it is necessary to identify unsatisfied medical care, an important data for understanding the status of medical service use, which is the evaluation standard for a country's health insurance system. However, few studies have focused on immigrants in the context of unmet healthcare needs.

Social and psychological factors, such as personal, environmental, and institutional factors collectively influence an individual's decision to access medical services. The most beneficial representative socio-behavioral model that accounts for these personal and external factors is the Andersen Model (also known as the "Behavior Model") of Service Utilization.[17] This model validated the factor classification system used in numerous prior studies and has been widely accepted as an appropriate analytical framework for identifying the factors that influence the creation of unmet healthcare needs of immigrants.[18] Within the model framework, predisposing factors are characteristics that predate the occurrence of a medical-condition needs. This category includes demographic and social characteristics, such as age and gender, and socioeconomic factors, such as education and social class. Enabling factors that affect the means and ability to use medical services are economic and social factors, such as income level and family resources.[19] The final category—need factors—includes physiological and psychological factors that relate to an individual's disability or disease and are directly responsible for the need to access medical services.[19] In this study, we relied on the Andersen model to identify the factors most responsible for unmet healthcare needs of members of multicultural Korean families. This model remains the most widely used analytical framework to analyze care for an individual likely to access medical services: predisposing, enabling, and need factors.[19] According to the model, the experience and related factors are further subcategorized into antecedent, possible, and desirable factors. Accordingly, this study aimed to identify the unmet healthcare needs of immigrants in Korea and their influencing factors based on the Andersen model.

Design

To gain insight into the unmet healthcare needs of immigrants in Korea, this study's design was cross-sectional based on secondary data obtained from 2019 nationwide Korea Community Health Survey (KCHS) conducted by the Korea Centers for Disease Control and Prevention.

Ethical Considerations

The survey was conducted by Korea Centers for Disease Control and Prevention by following the enforcement regulations of the Bioethics and Safety Act of 2005.[20] In addition, the survey was conducted after sufficiently explaining to the participants that the results would be used for statistical

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Received 18 September 2022; revised 30 November 2022; revised manuscript accepted 6 December 2022

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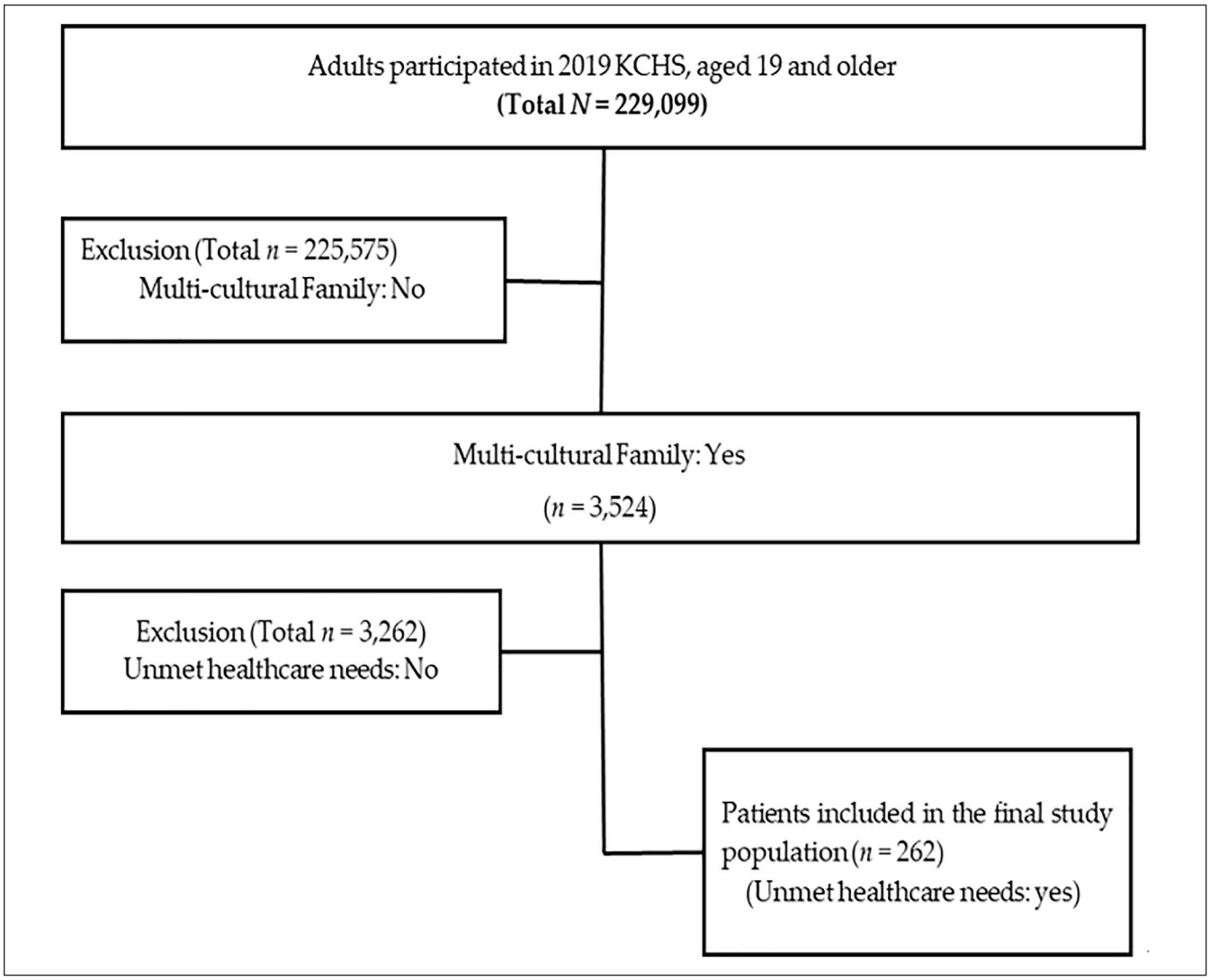

Figure 1. Flowchart of the study population.

purposes only and that confidentiality was guaranteed. Any personally identifiable information was deleted from the data provided; thus, participants' anonymity and confidentiality were guaranteed. The requirement for informed consent was waived by the Institutional Review Board (IRB; JBNU 2019-09-016-001) of Jeonbuk National University in Korea, to which the researcher belongs because there was no sensitive information and the survey was anonymous.

Participants

The KCHS has been conducted annually since 2008, and is a mandatory survey conducted by each local government to determine the health status of residents. The main goal of the development and dissemination of the KCHS is to provide the most versatile database possible regrading healthcare behaviors. The sample weights in the KCHS were calculated after adjusting for non-uniform selection probabilities and non-response, and revealing the population distribution through posterior stratification corresponding to the sample distribution.[21] The KCHS used a stratified 2-stage cluster sampling method. First, sample residential areas were selected using a stratified cluster sampling method and sample households were determined using the deterministic sampling method. All household members aged ≥19 years in the sample households were selected as the target population. Trained investigators visited the selected sample households and collected data through 1:1 interviews using a laptop, in which the survey program was stored, from August to October 2019. In 2019, the total number of participants was 229 099. Finally, there were multicultural members in the final analyses, and Figure 1 shows the participants' flow.

Variables

The dependent variable in this study was whether the respondents had experienced unmet healthcare needs. This was

evaluated using a single item: "In the past year, have you ever needed hospital care or an examination but did not receive it?" Respondents who answered, "Yes, I have experienced a situation where I did not receive care at least once," were defined as having experienced unmet healthcare needs. To analyze the factors that influence unmet healthcare needs, we followed Andersen's Behavioral Model of Health Service Use.[18,19] The factors suggested in this model can be categorized into 3 types: (1) Predisposing factors are an individual's propensity to use medical care and indicate the characteristics of participants before the need for treatment occurs.[4] This includes gender, age, marital status, education level, and the number of family members. (2) Enabling factors refer to the individual and community resources that enable the use of medical care. These factors include place of residence, monthly household income, employment status, and primary living livelihood security recipients. Recipients of basic livelihood security are those who receive in-kind support such as medical care, housing, and education because of difficulties in making a living. (3) Need factors are related to the symptom level of an individual's disability or disease, and is the direct cause of the use of medical facilities. We considered the presence of certain chronic diseases (hypertension and diabetes mellitus), the level of depression, stress, and perceived health status.

Statistical Methods

The data were analyzed considering a complex sampling design using IBM SPSS for Windows (version 27.0; IBM Corp., Armonk, NY, USA). The KCHS was conducted using a complex sampling design method. Therefore, according to the data analysis guidelines of the Korea Centers for Disease Control and Prevention, strata, cluster, and weight (w) were used. The detailed statistical analysis method is as follows:

(1) The general characteristics of the participants and the status of unmet healthcare needs were analyzed by a composite sample frequency analysis.
(2) The differences in unmet healthcare needs according to the characteristics of the participants were analyzed using a complex sample t-test and complex sample Rao-Scott χ^2 test.
(3) Complex sample multiple logistic regression analysis was performed for the factors influencing unmet healthcare needs.

Results

Sociodemographic Characteristics of the Participants

Of approximately 229 099 survey participants, 3524 were identified as members of multicultural families. Of the 3524 total participants, 262 (7.4%) had experienced unmet healthcare needs. First, considering the participants' gender as a predisposing factor, there were 44.2% men and 55.8% women, and the highest rate was 49.7% in the age range of 40 to 59 years. Regarding marital status, "married" accounted for approximately 82.5%, and in terms of education level, high school graduates accounted for 40.3% of participants, and college graduates accounted for 34.8%. Regarding the number of families living together, 2 to 3 people accounted for the majority at 79.3%. In addition, considering the residential area among the enabling factors, 73.4% of the participants lived in urban areas, and the monthly household income was 57.3% for the third and fourth quarters, 72.5% for the employed, and 3.9% for national primary livelihood security receivers. Of the need factors, hypertension was experienced by 15.1% of participants, and 7.9% of participants had diabetes mellitus. It was found that 7.8% of the respondents had depression, 27.7% answered that they experienced high stress, and 36.2% answered that their subjective health status was poor (Table 1).

Unmet healthcare needs of the participants

Among the participants of this study, 262 (7.4%) had unmet healthcare needs and 3262 (92.6%) had not experienced unmet healthcare needs (Table 2).

Unmet Healthcare Needs According to the Characteristics of the Participants

Table 3 shows the differences in unmet healthcare needs according to the general characteristics of the participants. Among the predisposing factors, there were significant differences in gender ($t=5.26$, $P=.022$), marital status ($F=5.74$, $P<.001$), and number of family members living together ($F=6.68$, $P=.002$). As for the enabling factors, there was a difference in unmet healthcare needs experience according to monthly income ($t=6.30$, $P=.012$) and national primary livelihood security receivers ($t=43.03$, $P<.001$). Among the need factors, there were significant differences in depression ($t=13.20$, $P<.001$), stress ($t=96.13$, $P<.001$), and perceived subjective health status ($F=21.4$, $P<.001$).

Factors Influencing Unmet Healthcare Needs in Immigrants

Before analyzing the factors affecting unmet healthcare needs, the autocorrelation of the error using Dubin-Watson analysis was found to be 2.032, indicating that there was no autocorrelation between the error terms. The tolerance limit results in multicollinearity using the variation inflation factor value were 1.08 to 2.54, which is 0.1 or more. In addition, as a result of examining whether the residuals follow a normal distribution through case diagnosis, all standardized residuals were found to be within ± 3; therefore, the distribution of the residuals could be assumed to be normal, indicating that

Table 1. General Characteristics of Participants (N = 3524).

Characteristics	Categories	n[a]	%[b]
Predisposing factors			
Gender	Men	1745	44.2
	Women	1779	55.8
Age	20-39	966	35.7
	40-59	1612	49.7
	60-79	764	12.5
	≥80	182	2.1
Marital status	Married	2,818	82.5
	Bereavement	437	7.0
	Divorce	99	3.3
	Single	170	7.2
Education level[c]	≤Elementary	756	10.7
	Middle school	558	14.2
	High school	1346	40.3
	≥College	860	34.8
Number of families member	Alone	230	5.5
	2-3	2608	79.3
	≥4	686	15.2
Enabling factors			
Region	Rural	2011	26.6
	Urban	1513	73.4
Monthly income (quintiles)	1Q-2Q	1577	42.7
	3Q-4Q	1947	57.3
Employment status	Yes	2516	72.5
	No	1008	27.5
NPSR[c]	Yes	139	3.9
	No	3382	96.1
Need factors			
HTN[c]	Yes	731	15.1
	No	2788	84.9
DM[c]	Yes	348	7.9
	No	3172	92.1
Depression[c]	Yes	247	7.8
	No	3275	92.2
Stress[c]	Yes	822	27.7
	No	2699	72.3
Perceived health status[c]	Poor	1218	36.2
	Moderate	1643	49.5
	Good	662	14.3

NPSR = National primary livelihood security receiver; HTN = hypertension; DM = diabetes mellitus.
[a]Unweighted count (frequency).
[b]Weighted %; SE: standard error.
[c]Missing values are excluded.

Table 2. Unmet Healthcare Needs in Participants (N = 3524).

Variable	Categories	n[a]	%[b]
Unmet medical needs	Yes	262	7.4
	No	3262	92.6

[a]Unweighted count (frequency).
[b]Weighted % SE = standard error.

the regression model was suitable. Based on these results, we concluded that no collinearity problem existed. We performed a hierarchical regression analysis to identify the factors influencing the existence of unmet healthcare needs of immigrants and presented our results as odds ratios (OR) with 95% confidence intervals (CI).

Among the predisposing factors, gender had an OR of 1.41. Therefore, women were 1.41 times more likely to experience unmet healthcare needs than men (95% CI = 1.03-1.94). As for enabling factors, those receiving government assistance (National primary livelihood security receiver) were 1.44 times (95% CI = 1.29-1.68) more likely to experience unmet healthcare needs than those who did not. Among the need factors, those who reported high stress were 1.34 times more likely to experience unmet healthcare needs than those who did not (95% CI = 1.26-1.45), and those who perceived their health as poor in subjective health perception were 2.35 times more likely (95% CI = 1.58-3.52), and those who perceived as moderate were 1.62 times more likely to experience unmet healthcare needs (95% CI = 1.18-2.20; Table 4).

Discussion

Parallel to other countries, Korea strives to ensure that medical services are delivered with an aim to maintain social equity.[22,23] Unmet healthcare needs are an indirect indicator of systemic medical inequality. As the number of immigrants in Korea has been increasing, the national government and citizens they represent are taking a new interest in these vulnerable groups. However, few studies have specifically examined unmet healthcare needs in this population. Accordingly, we analyzed the general characteristics of immigrants and the current status of unmet healthcare needs among them using Andersen's model to identify health-related vulnerabilities and the factors affecting their presence.

Overall, we determined that the rate of unmet healthcare needs among immigrants was 7.4%, which is lower by approximately 8.8% than that reported by Jang et al[23] in a 2018 study that used data from Korea's 2016 National Health and Nutrition Survey. Additionally, this was lower than the 8.5% study conducted in Canada.[24] However, this rate is approximately 3 times greater than the average rate of 2.5% found in a survey of 27 OECD countries.[15,16] This difference can be explained by differences in each country's healthcare and medical insurance systems, and the diverse medical service support systems available to immigrants. In other words, financial barrier (28.8%) is one of the main reasons unmet healthcare needs occur in a broad framework, which aligns with the results of previous studies.[25] The correlates of unmet healthcare needs can be summarized as follows.

Among the predisposing factors considered in the study, gender was statistically significant. The proportion of unmet

Table 3. Presence of Unmet Healthcare Needs According to Characteristics of Participants.

		Unmet healthcare needs				
		No		Yes		
Characteristics	Categories	n[a]	%[b]	n[a]	%[b]	*F*[c] or *t* (*P*)
Predisposing factors						
Gender	Men	1630	93.5	115	6.5	5.26 (.022)
	Women	1632	90.9	147	9.1	
Age	20-39	893	92.7	73	7.3	0.17 (.890)
	40-59	1495	92.1	117	7.9	
	60-79	712	92.7	52	7.3	
	≥80	162	91.4	20	8.6	
Marital status	Married	2630	92.7	188	7.3	5.74 (<.001)
	Bereavement	390	89.6	47	10.4	
	Divorce	83	84.1	16	15.9	
	Single	159	95.5	11	4.5	
Education level[d]	≤Elementary	691	91.1	65	8.9	1.42 (.235)
	Middle school	508	90.4	50	9.6	
	High school	1261	93.2	85	6.8	
	≥College	798	92.6	62	7.4	
Number of families member	Alone	204	86.9	26	13.1	6.68 (.002)
	2-3	2421	92.5	187	7.5	
	≥4	637	93.8	49	6.2	
Enabling factors						
Region	Rural	1,857	92.4	154	7.6	0.01 (.939)
	Urban	1405	92.3	108	7.7	
Monthly income (quintiles)	1Q-2Q	1448	91.1	129	8.9	6.30 (.012)
	3Q-4Q	1814	93.3	133	6.7	
Employment	Yes	2328	92.0	188	8.0	0.84 (.358)
	No	934	93.2	74	6.8	
NPSR[d]	Yes	117	79.0	22	21.0	43.03 (<.001)
	No	3143	92.9	239	7.1	
Need factors						
HTN[d]	Yes	684	93.7	47	6.3	1.58 (.209)
	No	2573	92.1	215	7.9	
DM[d]	Yes	331	93.2	17	6.8	0.25 (.620)
	No	2927	92.3	245	7.7	
Depression[d]	Yes	211	85.3	36	14.7	13.20 (<.001)
	No	3049	93.0	226	7.0	
Stress[d]	Yes	707	85.1	115	14.9	96.13 (<.001)
	No	2553	95.1	146	4.9	
Perceived health status[d]	Poor	1161	95.1	57	4.9	21.40 (<.001)
	Moderate	1513	92.5	130	7.5	
	Good	587	84.9	75	15.1	

NPSR = National primary livelihood security receiver; DM = diabetes mellitus; HTN = hypertension.
[a]Unweighted count (frequency).
[b]Weighted %.
[c]Rao-Scott composite sample chi-square tests.
[d]Missing values are excluded.

healthcare needs was higher in women than in men. This result is consistent with that of Tadiri et al,[26] Oh and Gil,[27] and Woo et al.[17] While these studies reflect different degrees of statistical significance, in all cases, the result may be linked to women's healthcare being neglected as household responsibilities take priority. This result, in conjunction with others, suggests that gender differences should be considered when drafting policies to reduce unmet healthcare needs.

Next, the enabling factors related to unmet healthcare needs were examined, and national primary livelihood

Table 4. Factors Related to Unmet Healthcare Needs.

Variable	Categories	OR (95% CI)	*P* Value
Predisposing factors			
Gender	Men	Reference	.033
	Women	1.41 (1.03-1.94)	
Marital status	Married	0.56 (0.256-1.235)	.152
	Bereavement	0.64 (0.270-1.497)	.299
	Divorce	0.48 (0.207-1.118)	.089
	Single	Reference	
Number of families member	Alone	0.70 (0.424-1.154)	.162
	2-3	0.95 (0.644-1.392)	.780
	≥4	Reference	
Enabling factors			
Monthly income (quintiles)	1Q-2Q	0.88 (0.658-1.181)	.398
	3Q-4Q	Reference	
NPSR	Yes	1.44 (1.29-1.68)	<.001
	No	Reference	
Need factors			
Depression	Yes	Reference	.740
	No	0.92 (0.563-1.503)	
Stress	Yes	1.34 (1.26-1.45)	<.001
	No	Reference	
Perceived health status	Bad	2.35 (1.58-3.52)	<.001
	moderate	1.62 (1.18-2.20)	.003
	Good	Reference	

OR = odds ratio; CI = confidence interval; NPSR = national primary livelihood security receiver; DM = diabetes mellitus; HTN = hypertension.

security receivers were found to be statistically significant. The higher is the risk of unmet healthcare needs among recipients of government assistance. These results are consistent with the results of past studies.[25,28,29] This result may be explained by the fact that as monthly household income decreases, medical expenses become more burdensome, incentivizing the avoidance of hospitals, clinics, and treatment. Ultimately, the result is a vicious cycle that leads to severe deterioration of health and a commensurate increase in medical expenses. Although Korea has already implemented a nationalized insurance system to ease the economic burden of medical costs, the reality that unmet healthcare needs are more frequently experienced by immigrants than other Korean families suggests that the government should investigate whether the existing system is being adequately utilized and, if not, develop supplemental policies.

Finally, while investigating the need factors related to unmet healthcare needs, we found that the higher the perceived subjective health status, the lower the risk of experiencing unmet healthcare needs. This result is similar to those of Hwang[25] and Yi and Lee.[12] This could be because of a low demand for medical services, because they think they perceive themselves to be healthy. In addition, it was found that those who perceived stress had more unmet healthcare needs concurrently, and this result is similar to that reported by Jung and Ha[30] and Cloos et al.[24] In other words, if people are vulnerable to stress perception, they will be more exposed to physical diseases, and as a result, the percentage of unmet healthcare needs increases, which can be seen as a result of this. We also determined that the risk of unmet healthcare needs was higher among those with perception of depression, consistent with the results found by Park et al[29] and Cloos et al.[24] The government could encourage the participation of immigrants in a program that allows them to understand their health status and manage stress, areas in which immigrants are particularly vulnerable. In the current environment, where the number of immigrants is steadily increasing, new comprehensive policies to address unmet healthcare needs should be considered and systematically implemented.

Limitations

This study has certain limitations. First, the results cannot be easily generalized because they are highly likely to be affected by the country's cultural background, medical expense payments, and medical insurance systems. Therefore, future studies could interpret these results according to the national healthcare system. Second, more diverse factors, such as the distance from medical facilities and subscription to private insurance could affect unmet healthcare demand.[31] However, these variables were not included in the regional health survey data and could not be controlled. Third, because the KCHS is based on participants' self-reports, the

accuracy of survey data could have been compromised by several biasing factors, such as recall bias. Finally, since this study used a cross-sectional design based on 1-year (2019) data, we propose a study to confirm causality. In the future, it will be possible to explore the changing trends through time-series analysis using the longitudinal data accumulated in these studies.

Despite these limitations, our study is significant for several reasons. First, we used recent representative data from the KCHS to analyze the status of unmet healthcare needs and multiple correlations. The greatest strength of this study is that it specifically investigated the factors affecting the unmet healthcare needs of immigrant families and the unmet healthcare needs experience rate using nationwide data. Owing to the lack of current research, studies are required to evaluate and implement health policies. In addition, this research contributes to migration and health, viewed as a global public health priority that requires effective intersectoral policies through coordinated action on the social determinants of health. We believe this study will serve as a quality reference for countries with similar healthcare systems to Korea, particularly France, Germany, Japan, and Ireland, where private insurance will complement the cost-sharing obligations of public systems.

Conclusions

This study is a secondary data analysis performed to evaluate the experiences of immigrants with unmet healthcare needs. The following 3 factors lead to unmet healthcare needs. First, regarding predisposing factors, gender was more likely lead to experience unmet healthcare needs. Second, regarding enabling factors, participants experienced unmet healthcare needs when government assistance (national primary livelihood security receivers) was more prevalent. Third, regarding need factors, participants' stress perception, and perceived health status were identified as factors influencing unmet healthcare needs. Since unmet healthcare demand is a significant indicator of the medical system, policy alternatives, such as medical system improvement to prevent the unmet healthcare needs of immigrants living in Korea, should be prepared based on the results of this study. In addition, we suggest that the government examine whether those members of multiracial families are less likely to have enrolled in the national insurance scheme and identify new means of encouraging enrollment. In light of the reality that the number of immigrants is steadily increasing, the government should consider systematic policy reforms that address the increased vulnerability to the unmet healthcare needs that immigrants are experiencing. To this end, we suggest a study to identify the influencing factors more clearly by first conducting a full-scale survey of immigrants residing in Korea.

Author Contributions

Conceptualization, SKP; methodology, SKP, HYK, and YML; formal analysis, SKP and HYK; investigation, and data curation, SKP and HYK; writing-original draft, SKP, HYK, and YML; writing—review and editing, SKP and HYK; visualization, SKP. All authors read and approved the final manuscript.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: This paper was supported by international research funds for humanities and social science of Jeonbuk National University in 2020.

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Institutional Review Board Statement

This study was performed after receiving approval from the Institutional Review Board (IRB) of the Jeonbuk National University to which the researcher belongs (JBNU 2019-09-016-001).

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