Association Between Divorce and Access to Healthcare Services Among Married Immigrants: Propensity Score Approaches

Suyeong Bae
Yonsei University - Mirae Campus https://orcid.org/0000-0003-0739-9424
James E. Graham
Colorado State University
Sangun nam
Yonsei University - Mirae Campus
Ickpyo Hong (ihong@yonsei.ac.kr)
Yonsei University - Mirae Campus

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Abstract

Background: Research is needed to improve access to healthcare services by minority groups. The population of married immigrants is increasing rapidly in Korea. While divorce is a social determinant of health among married immigrans, it is not clear about its association with access to healthcare services. Therefore, we examined healthcare services utilization in married immigrants.

Methods: We retrieved data from 11,778 adults in the 2018 Korea National Multicultural Family Survey. We used propensity score matching methods. We analyzed whether the sex of divorced immigrants is associated with healthcare access using multivariable logistic regression analysis. Further, we analyzed the association between divorce and access to healthcare services among married immigrants.

Results: There were 691 (5.8%) divorced immigrants in the data set. The married male immigrants had no association between divorce status and healthcare access (adjusted odds ratio = 1.059, 95% confidence interval [CI]=0.552–2.033, p = 0.8620). Divorced immigrants were less likely to receive healthcare services than married immigrants (adjusted OR=1.42, 95% CI=1.06–1.88).

Conclusion: Our findings revealed that divorce increased the risk of limited healthcare services among immigrants. Policymakers and health providers should be aware of these potential disparities in this vulnerable minority population.

Background

The health of married immigrants around the world has become a major issue in health science [1]. Married immigrants must live a new life by adapting to a different socio-cultural environment from their home country. In this process, we experience various difficulties such as language problems, economic difficulties, and cultural conflicts [2]. In addition, the health of married immigrants may deteriorate due to difficulties in understanding the health insurance and medical system for health management [3]. This can reduce the health of married immigrants and lead to poor health literacy.

Health literacy guides an individual in understanding and using information to promote and maintain health. The decline in health literacy corresponds to poor disease management. This results in lower health levels and higher health care expenditures. The health literacy of married immigrants is a major factor influencing access to health-related services [4].

The number of married immigrants entering Korea is increasing, and the country is becoming a multicultural society due to the influx of various migrants. According to the 2019 immigration statistics released by the Korea Immigration Service, the number of married immigrants in 2019 was 166,025, an increase of 14,417 from 2015, and an average increase of 3.3% in the last 3 years [5]. To prepare for a multicultural society, Korea has increased the number of welfare policies and educational programs for married immigrants [6]. As a result, depression was increase and life satisfaction among female marriage immigrants have decreased [7, 8]. However, according to the report, married women immigrants living in

Korea were more likely to experience health inequality [9]. In addition, studies on the health-related quality of life and the use of healthcare services of married immigrants are only targeting married women migrants, and the current status related to the health of male marriage immigrants is insufficient.

As the number of married immigrants is increasing, divorce in the population is becoming a common phenomenon. According to the 2019 Marriage and Divorce Statistics Report, divorce of married immigrants accounted for 6.2% of all divorces [5]. Divorce is one of the social determinants of health. Indeed, according to Lee (2020), the effect of changing marital status on concomitant changes in health behavior was investigated [10]; health disabilities and changes in health promotion were evident in women who experienced divorce or death of a spouse [10]. For married immigrants, divorce leads to social isolation and has a profound impact on their lives [11]. It is important to understand the impact of divorce on an individual's health, as life changes can make worsen health indicators. However, the link between changes in marital status and changes in health behavior among married immigrants is unclear.

Our study supplanted the limitations of previous studies. First, most studies about married immigrants are limited to female.. According to Statistical Korea, the 2019 population of married male immigrants was 28,931, but studies including married male immigrants in the literature review were insufficient [5]. Second, divorce is directly related to economic problems, but its relationship with healthcare services access is not clear. Therefore, this study aims to examine the association between divorce and access to healthcare services among male and female married immigrants by accounting for various socioeconomic indices.

Methods

Study population

We retrieved data from 17,073 adults in the 2018 Korea National Multicultural Family Survey. Our final sample included 11,778 ever married immigrants after excluding 5,295 cases with missing values on key variables. The Korea National Multicultural Family Survey is conducted by the Korea Ministry of Gender Equality and Family and targets ever married immigrants, their spouses and children. It is implemented to understand the current status of family relations, lifestyles, family problems, economic conditions, and educational support for multicultural families. In this study, the de-identified were retrieved, and the study has been reviewed and approved by the local Institutional Review Board.

Study variables

Independent and dependent variables

The independent variable was divorce status (yes, no) in ever married immigrants. The dependent variable was difficulty accessing healthcare services defined by using the question, "Did you have any experiences in the past year where you couldn’t go to the hospital (e.g., inpatient facilities or ambulatory care) when you were sick?" [yes, no].

Covariates

The covariates were demographics and self-reported social-behavior and economic status characteristics, including experiences participating in meetings, frequency of social services experience, social discrimination, socioeconomic status, sadness or despair, life satisfaction, and self-rated health status (Table 1). The experiences participating in meetings were divided to various sub-theme such as parents, friends, community society, religion, civic group meeting. The frequency of social services experience was the number of support in economic and psychology consultation by government. The social discrimination was assessed by whether the survey participants experienced any types of discrimination in a local community (yes, no). The life satisfaction and self-rated health status were measured using a 5-point Likert scale (1=very good, 2=good, 3=neutral, 4=poor, 5=very poor) and the socioeconomic status was measured using a 3-point rating scale (1=high, 2=middle, 3=low). Sadness or despair were used to assess the emotional status with a dichotomous category (yes, no).

Data analysis

The study was a retrospective cross-sectional design using a nationally representative survey database. Descriptive statistics (Chi-squared test and the Wilcoxon rank-sum nonparametric test) were used to compare characteristics of the two comparison groups (divorce versus not divorce). Categorical variables were presented as frequency and percentage, and numeric variables were presented as mean and standard deviations. We conducted two analyses. First, we analyzed whether the sex of divorced immigrants is associated with healthcare access using multivariable logistic regression analysis (divorced male immigrants versus divorced female immigrants). Second, we analyzed whether the divorced status of ever married immigrants is associated with healthcare access, using three covariate adjustment methods. Three covariate adjustment methods (multivariable logistic regression and two propensity score matching analyses) were used to assess the robustness of the point estimations. Specifically, we used inverse probability of treatment weighting (IPTW) with average treatment effect (ATE) weight and 1:1 Greedy propensity score matching [12].

The propensity score was calculated through a logistic regression analysis that accounts for the study covariates. The most common propensity score matching approaches are 1:1 Greedy propensity score matching and IPTW [12]. The divorced immigrants group and the non-divorced immigrants group were matched based on a propensity score that reflected the distribution of the study covariates. The IPTW with the ATE was weighted to calculate a generalized estimate of the entire population from which the observed samples were drawn [13]. For the 1:1 Greedy propensity score matching approach, we performed diagnostics and checked if the study covariates were balanced across the two comparison groups through logit propensity score (LPS). The LPS is way of assessing the balances of variables and presents how well the distribution of variables is balanced [14]. We considered a value between -0.1 and 0.1 standardized mean difference of all covariates and LPS as a good balance by the 1:1 Greedy propensity score matching [15]. The statistical significance level was 0.05. We calculated adjusted odds

ratio (AOR) as point estimation with 95% confidence interval (CI). All analyses were performed using SAS version 9.4 software.

Results

The final sample included 691 (5.9%) divorced immigrants and 11,807 (94.1%) non-divorced immigrants. The average age of divorced immigrants was 45.1 years (standard deviation [SD] = 10.9), and that of non-divorced immigrants was 39.1 years (SD = 10.5). Table 1 summarizes the group differences before and after the 1:1 Greedy propensity score matching. Prior to the propensity score matching, 16 of 19 variables were statistically different between the two comparison groups (all $p < 0.05$). After the propensity score matching, all variables and logit of the propensity score (LPS) were balanced between the two comparison groups (all $p > 0.05$). After the propensity score matching, the absolute values of the standardized mean differences between the divorced and non-divorced immigrants were less than 0.10 [15].

Table 2 shows the results of the association between divorce status and healthcare access according to the sex of married immigrants. For the married female immigrants, there was an association between divorce status and healthcare access (adjusted odds ratio [AOR]=1.414, 95% confidence interval [CI] =1.089–1.836, p =0.0094), but not for married male immigrants (AOR = 1.059, 95% CI=0.552–2.033, p = 0.8620). The association between divorce status and healthcare access differed according to sex.

Table 3 presents the association between divorce and the difficulties in use of healthcare services. In the unadjusted model, the risk of difficulty in accessing healthcare services was higher for divorced immigrants versus non-divorced immigrants (odds ratio [OR]= 2.323, 95% confidence interval [CI]=1.910–2.826). The magnitude of risk decreased in the adjusted model (AOR=1.367, 95% CI=1.076–1.736), and the two models with propensity score matching (IPTW: AOR=1.147, 95% CI=1.057–1.243; 1:1 Greedy matching: AOR=1.423, 95% CI=1.057–1.882; Table 2); however, the point estimations remained statistically significant (all $p < 0.05$).

Discussion

We investigated the association of divorce status of married immigrants' access to their access healthcare services by sex. Further, we compared the use of healthcare services of married immigrants according to divorce status (Yes versus No). The married female immigrants differed in the use of healthcare services depending on their divorce status, but married male immigrants did not. Divorced immigrants were more likely to not use healthcare services than non-divorced immigrants. Our findings would inform clinicians or healthcare policy-makers about critical implications for divorced versus non-divorced immigrants' use of healthcare services.

The number of married immigrants residing in Korea is increasing, and divorce rate among them is also increasing accordingly [5]. Divorce is one of the social determinants of health and has a profound impact

on the lives of married immigrants [16]. In previous studies, divorce has affected the lives of married female immigrants. Life satisfaction was low, and due to low income, they experience difficulty in social adaptation [17]. However, there are insufficient studies on the effect of divorce on the use of healthcare services. The purpose of this study was to overcome the limitations of previous studies. Our results suggest that there is a link between the divorce of married immigrants and the use of healthcare services. Social determinants of health are factors to be considered to improve the quality of public health [18]. Public health should prevent diseases and promote health, and to this end, must consider the background and environment of individuals [19]. However, our research results suggest the insufficiency of public health policies for married immigrants. Further, our results also point to the need for in-depth study on the effects of social determinants of married immigrants' health on public health and the necessity of establishing a holistic and comprehensive health policy.

The association between divorce and healthcare service access differed according to sex. For married male immigrants, there was an association between divorce and access to healthcare services. However, there was an association between divorce and the access to healthcare services for married female immigrants. Previous studies have reported that the access to healthcare services is influenced by socioeconomic status [20]. Finance is a factor that varies greatly depending on the sex of marriage immigrants. According to the literature, the employment rate of married male immigrants was significantly higher than that of married female immigrants [8]. It is expected that these economic factors have influenced the access to healthcare services. Our results support existing research findings that finance capability affects the access to healthcare services. In addition, Korea is currently conducting several projects to increase the employment rate of married female immigrants [21], thereby increasing the employment rate of married female immigrants. Increased employment rates may be associated with increased access to health services. In a future study, it is necessary to analyze the current status of the married immigrant policy promulgated in South Korea through a study comparing the increase in the employment rate of married immigrants and the access to healthcare services.

In preparation for the expansion of a multicultural society, welfare policies such as multicultural family support project are increasing for married immigrants residing in South Korea [22]. Consequently, the experience of social discrimination and depression among married immigrants has decreased. However, the use of healthcare services has been constant or has decreased [7]. This suggests the insufficiency of public health policies for married immigrants. The role of public health is to prevent disease and promote health [19]. For social integration, public health should consider the background and environment of individuals [23]. The divorce status was factors influencing divorce have been well studied [24]. However, research on the effects of divorce on healthcare utilization is insufficient. To improve the quality of public health, in-depth research is needed on the association between the social determinants of health and healthcare utilization.

The decrease in access to healthcare services can lead to a decrease in health literacy. In a previous study, finances capabilityand language barriers were reported as reasons for low use of healthcare services in married immigrants [25]. Health literacy of immigrants is significantly lower than that of

ordinary Koreans, and studies have revealed that lower health literacy is associated with higher dissatisfaction with life [26]. In addition, although married male immigrants have had lower health literacy skills than married female immigrants [1], studies on the former's access to healthcare services are insufficient. South Korea discloses information about the use of healthcare services and necessary vocabulary to married immigrants, but it is not possible to confirm whether the disclosed information is actually used by married immigrants [27]. In addition, married immigrants still have a high demand for healthcare service education, suggesting the need for direct healthcare education services [28]. Therefore, we recommend the need to include healthcare service education to the social integration program currently being implemented in South Korea. The implementation of healthcare service education is expected to not only improve the health literacy of married immigrants but also improve access to healthcare services.

In this study, selection bias, which is a typical limitation of observational research, was addressed by propensity score matching. Homogeneity verification indirectly confirmed that the sample that was statistically analyzed was representative of the population. It is also necessary to question the heterogeneity of variance if there are differences in the demographics and covariates across comparison groups [29]. If the homogeneity of each group is not verified, robust results cannot be obtained in determining the effect of the independent variables on the dependent variable. In the case of experimental studies, the effectiveness of the interventions applied by the researchers can be questioned [30]. In this study, we analyzed the association between divorce and the access to healthcare services by securing the homogeneity of all demographic characteristics and covariates across the comparison groups using propensity score matching methods. We found that access to healthcare services is affected by several factors (e.g., financial support, economic problems). We controlled variables related to the access to healthcare services in our analysis. The results were robust, and divorce was found to be associated with access to healthcare services, even after controlling for other variables.

Limitations

The limitations of this study are as follows. First, while various statistical models were utilized to control selection bias, accurate causal inferences cannot be made in this cross-sectional study. In other words, although divorce was associated to the use of healthcare services among married immigrants, it is unclear whether divorce directly restricts access to healthcare. Therefore, prospective studies are needed to infer causal relationships between divorce and the access to healthcare services. Second, the study database did not contain additional factors that might be associated with the use of healthcare services by married immigrants (e.g., occupation, chronic condition). Future studies should verify the study findings by including various health behaviors.

Conclusion

The study investigated the association between divorce and use of healthcare services in married immigrants. Divorced immigrants had lower access to healthcare services than non-divorced immigrants.

There are many welfare policies and adaptation programs in place for married immigrants, but health programs are still in high demand. There was also a lack of adaptation programs for vulnerable subpopulations, such as divorced immigrants. Therefore, the study suggests the need to establish a healthcare or social program to improve health literacy and access for divorced immigrants.

Abbreviations

CI: confidence interval; OR: odds ratio; IPTW: inverse probability of treatment weighting; ATE: average treatment effect; LPS: logit propensity score; AOR: adjusted odds ratio; SD: standard deviation

Declarations

Ethics approval and consent to participate

The study has been reviewed and approved by the local University Institutional Review Board.

Consent for publication

Not applicable.

Availability of data and materials

The datasets analyzed during the current study are available in the [Microdata Integrated Service] repository, [https://mdis.kostat.go.kr/index.do].

Competing interests

No conflict of interest has been declared by the authors.

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Authors' contributions

All authors provided concept/research design and review. Dr. Hong was designed study and formal analysis. Ms. Nam was prepared table. Dr. Hong and Dr. Graham was editing and consulting manuscript.

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Tables

Table 1. Demographic information of participants before and after 1:1 Greedy propensity score matching

Variables	Before matching *N*=11778			After matching *N*=1364		
	No divorce (*n*=11087)	Yes divorce (*n*=691)	*p*	No divorce (*n*=682)	Yes divorce (*n*=682)	*p*
Age †) (years)	39.12 (10.50)	45.14 (10.93)	0.1367	45.39 (12.77)	45.09 (10.89)	0.6369
Sex			0.0981			0.4649
Male	1992 (17.97)	107 (15.48)		117(17.16)	107 (15.69)	
Female	9095 (82.03)	584 (84.52)		564 (82.84)	575 (84.31)	
Currently employed (Ref=Yes)	6733 (60.73)	535 (77.42)	<.0001*	525 (76.98)	526 (77.13)	0.9487
Educational attainment			0.0346*			0.8556
Less than Elementary school	9693 (87.43)	623 (90.16)		616 (90.32)	614 (90.03)	
Above Middle school	1394 (12.57)	68 (9.84)		66 (9.68)	68 (9.97)	
Residential area			<.0001*			0.8497
Urban	7078 (63.84)	527 (76.27)		515 (75.51)	518 (75.95)	
Suburban	4009 (36.16)	164 (23.73)		167 (24.49)	164 (24.05)	
Household income (₩)			<.0001*			0.7500
<1,000,000	347 (3.13)	164 (23.73)		152 (22.29)	155 (22.73)	
1,000,000–3,000,000	4292 (38.71)	455 (65.85)		465 (68.18)	455 (66.72)	
3,000,000–5,000,000	4647 (41.91)	62 (8.97)		59 (8.65)	62 (9.09)	
>5,000,000	1801 (16.24)	10 (1.45)		6 (0.88)	10 (1.47)	
Difficulties in living in Korea (Count)			0.0017*			0.6510
1	5471 (49.35)	305 (44.14)		319 (46.77)	302 (44.28)	
2	2922	224		211	220	

	(26.36)	(32.42)		(30.94)	(32.26)	
3	2694 (24.30)	162 (23.44)		152 (22.29)	160 (23.46)	
Participation activities (Ref=Yes)						
Parents	1645 (14.84)	53 (7.67)	<.0001*	61 (8.94)	53 (7.77)	0.7277
Friends	6621 (59.72)	336 (48.63)	<.0001*	339 (49.71)	335 (49.12)	0.8285
Community	1408 (12.70)	37 (5.35)	<.0001*	37 (5.43)	37 (5.43)	1.0000
Religion	2698 (24.33)	127 (18.38)	0.0004*	146 (21.41)	125 (18.33)	0.1541
Civic groups	701 (6.32)	21 (3.04)	0.0005*	17 (2.49)	20 (2.93)	0.6171
Experiences of social discrimination (Ref=Yes)	3513 (31.69)	208 (30.10)	0.3847	200 (29.33)	208 (30.50)	0.6362
Self-rated health			<.0001*			0.5191
Very Good	3139 (28.31)	101 (14.62)		103 (15.10)	101 (14.81)	
Good	5206 (46.96)	246 (35.60)		262 (38.42)	245 (35.92)	
Neutral	2121 (19.13)	174 (25.18)		182 (26.69)	174 (25.51)	
Poor	555 (5.01)	142 (20.55)		111 (3.52)	134 (19.65)	
Very Poor	66 (0.60)	28 (4.05)		24 (3.52)	28 (4.11)	
Sadness or despair (Ref=Yes)	2867 (25.86)	331 (47.90)	<.0001*	316 (46.33)	324 (47.51)	0.6643
Socioeconomic status			<.0001*			0.8288
High	706 (6.37)	13 (1.88)		14 (2.05)	13 (1.91)	
Middle	7594 (68.49)	204 (29.52)		193 (28.30)	203 (29.77)	
Low	2787 (25.14)	474 (68.60)		475 (69.65)	466 (68.33)	
Life satisfaction			<.0001*			0.7548

Very Good	3248 (29.30)	50 (7.24)		49 (7.18)	50 (7.33)	
Good	4065 (36.66)	165 (23.88)		165 (24.19)	164 (24.05)	
Neutral	3092 (27.89)	294 (42.55)		307 (45.01)	290 (42.52)	
Poor	615 (5.55)	160 (23.15)		146 (21.41)	157 (23.02)	
Very Poor	67 (0.60)	22 (3.18)		15 (2.20)	21 (3.08)	
Government support (Ref=Yes)	319 (2.88)	87 (12.59)	<.0001*	93 (13.64)	85 (12.46)	0.5202
Frequency of social services experience †)	1.86 (2.04)	1.27 (1.72)	<.0001*	1.24 (1.70)	1.28 (1.72)	0.8118

Note: Values are presented as mean (standard deviation) or numbers (%)

†) Mean (standard deviation)

*$p < 0.05$

Table 2. Association between sex and difficulties in healthcare services access for divorced immigrants.

Estimated method	Limited healthcare services access					
	Male			Female		
	AOR†	95% CI	*p*	AOR†	95% CI	*p*
Adjusted logistic regression	1.059	0.552–2.033	0.8620	1.414	1.089–1.836	0.0094**

AOR: adjusted odds ratio; CI: confidence interval.

† *p*-values for estimated odds ratios were calculated using multivariable logistic regression.

*$p < 0.05$, ** $p < 0.01$

Table 3. Association between divorce and difficulties in healthcare services access

Estimated method	Limited healthcare services access		
	AOR[†]	95% CI	*p*
Unadjusted logistic regression	2.323	1.910–2.826	<.0001**
Adjusted logistic regression	1.367	1.076–1.736	0.0103*
Inverse probability of treatment weighting and ATE weight with logistic regression	1.147	1.057–1.243	0.0009**
1:1 Greedy propensity score matching with logistic regression	1.423	1.075–1.882	0.0135*

AOR: adjusted odds ratio; CI: confidence interval; ATE: average treatment effect.

[†] *p*-values for estimated odds ratios were calculated using multivariable logistic regression.

*$p < 0.05$, ** $p < 0.01$