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Original Article

Disclosure of Indemnity-Type Private Health Insurance and Outpatient Utilization: A Cross-sectional Analysis of Differences Between Clinics and Hospitals in Korea

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Abstract

Background: Korea has experienced rapid growth in healthcare expenditure alongside increasing enrollment in indemnity-type private health insurance (PHI), which reduces out-of-pocket costs. Prior studies have shown higher utilization among PHI subscribers, but little is known about whether patients' disclosure of PHI enrollment to providers is associated with outpatient utilization and whether this association differs between clinic- and hospital-level institutions.

Methods: Using nationally representative data from the 2023 Korea Health Panel, we analyzed 4948 adults enrolled in indemnity-type PHI. Disclosure was assessed by whether respondents reported informing any outpatient provider of their PHI enrollment during the past 12 months. Outcomes were outpatient visits and average out-of-pocket cost per visit. We used negative binomial regression for visit counts and a gamma generalized linear model with a log link for costs, overall and by institution type.

Results: Overall, 10.9% of respondents reported disclosing their PHI enrollment. Disclosure was associated with higher outpatient visit frequency (incidence rate ratio [IRR] = 1.157, 95% CI: 1.077–1.244), corresponding to approximately 15.7% more visits among disclosers than non-disclosers. It was also associated with higher average out-of-pocket cost per visit (coefficient = 0.145, 95% CI: 0.028–0.262), corresponding to approximately 15.6% higher per-visit out-of-pocket costs. At clinic-level institutions, disclosure was significantly associated with more visits and higher per-visit costs; no significant associations were observed at hospital-level institutions.

Conclusion: Patients' disclosure of indemnity-type PHI enrollment is associated with higher outpatient visit frequency and per-visit out-of-pocket costs, particularly at clinic-level institutions. Insurance-status information may contribute to higher outpatient utilization in settings with strong fee-for-service incentives; however, these associations do not establish provider-induced demand.

Keywords: Private Health Insurance, Insurance Disclosure, Outpatient Utilization, Provider-Induced Demand, Fee-for-Service, Korea

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Introduction

Korea has experienced rapid growth in healthcare expenditure over the past decade, with current health spending now approaching the average level of high-income OECD (the Organisation for Economic Co-operation and Development) countries.[1] National health expenditure has increased much faster than overall economic growth, driven by population aging, rising expectations for medical care, and a fee-for-service payment system that rewards service volume.[2] At the same time, the National Health Insurance (NHI) benefit package continues to provide incomplete coverage, leaving a substantial share of healthcare costs to be paid out-of-pocket by patients.[3,4] As a result, individuals commonly purchase indemnity-type private health insurance (PHI) to protect themselves against the financial risks associated with copayments and non-covered services. In Korea, enrollment in indemnity-type PHI has expanded rapidly and now covers a large majority of the adult population, making PHI a central feature of the health financing landscape.[5]

Although indemnity-type PHI can reduce financial barriers to needed care, concerns have been raised that it also promotes overutilization and drives growth in national healthcare expenditure. A growing body of research in Korea and internationally suggests that subscribers to supplemental or indemnity-type PHI use more healthcare services and incur higher medical expenditures than non-subscribers or those with public coverage alone.[6-10] At the same time, there is extensive theoretical and empirical literature on provider-induced demand, defined as the phenomenon whereby healthcare providers increase the volume or intensity of services in response to financial incentives and perceived patient ability to pay, beyond what would be clinically justified

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Key Messages

Implications for policy makers

- Strengthen monitoring of outpatient volume and per-visit costs in clinic-level institutions, where disclosure of indemnity-type private health insurance (PHI) is linked to higher utilization.
- Develop targeted contracts and clinical protocols between private insurers and clinics to curb volume-driven care while preserving access to necessary services.
- Reinforce professional ethics guidance and peer review in primary care clinics to discourage unnecessary tests and procedures driven by perceived financial capacity.
- Consider hybrid payment models and enhanced oversight that reduce the strength of fee-for-service incentives in high-risk outpatient settings.

Implications for the public

When patients tell doctors that they have indemnity-type private health insurance (PHI), clinics may be more likely to recommend additional visits or more expensive services. Our study shows that such disclosure is associated with higher outpatient use in clinics but not in hospitals. This does not mean that all extra care is unnecessary, but it suggests patients should ask questions about the necessity and alternatives of recommended tests or treatments. Understanding how insurance information can influence provider behavior can help patients make more informed choices, avoid avoidable costs, and seek second opinions when they feel uncertain about proposed care.

by patients' underlying health needs.[11-13] Building on this literature, studies from various health systems have shown that service volume responds to fee levels, payment methods, and competition, although the magnitude and direction of provider responses are highly context-dependent.[13-19]

The Korean healthcare system provides a particularly salient context for examining how information about patients' insurance status might interact with institutional incentives. Indemnity-type PHI in Korea reimburses patients directly and does not involve contractual relationships between private insurers and medical institutions.[20] Providers are generally unaware of patients' indemnity-type PHI status unless patients voluntarily disclose this information during clinical encounters. Clinic-level institutions are predominantly self-employed practices operating under fee-for-service reimbursement with relatively low consultation fees and weak gatekeeping, creating strong incentives to expand service volume and to offer non-covered services.[21-24] By contrast, hospital-level institutions are typically corporate or public organizations in which physicians are salaried and subject to more formal internal oversight, potentially attenuating individual financial incentives.[25] These structural differences suggest that providers in clinics and hospitals may respond differently when they learn that a patient faces reduced financial barriers to care.

While prior research has documented higher utilization among indemnity-type PHI subscribers and explored how payment structures influence provider behavior, much less is known about whether and how patients' communication of insurance status to providers affects outpatient utilization at the point of care. Voluntary disclosure of PHI enrollment constitutes a distinct mechanism from formal payment reforms: it operates through information asymmetry and providers' perceptions of patients' ability to pay, rather than through changes in fee schedules or capitation rates. In Korea's arrangement—where providers do not know patients' indemnity-type PHI status unless it is disclosed—such communication may create conditions conducive to both patient-side and provider-side moral hazard. However, empirical evidence on this information-driven mechanism, and on whether its effects vary by institutional context, remains scarce.

Against this backdrop, the present study addresses two related questions. First, is patients' disclosure of indemnity-type PHI enrollment to outpatient providers associated with differences in outpatient utilization? Second, do these associations differ between clinic- and hospital-level institutions in Korea? Using cross-sectional data from the 2023 Korea Health Panel, we analyze the association between disclosure and (1) outpatient visit frequency and (2) average out-of-pocket cost per visit, both overall and by institution type. Our aim is not to provide definitive causal evidence of provider-induced demand, but rather to investigate whether patterns of outpatient utilization are consistent with conditions under which providers and patients might respond differently to information about insurance coverage across distinct institutional settings.

Methods

Data Source and Study Population

This study uses annual data from the second wave of the Korea Health Panel, jointly conducted by the Korea Institute for Health and Social Affairs and the National Health Insurance Service. Of the 12 169 respondents who participated in the 2023 Korea Health Panel Survey, 5092 were selected as subjects for analysis after excluding 2297 minors under the age of 20 and 4780 who were not enrolled in indemnity-type PHI. We excluded individuals younger than 20 years because their PHI enrollment and healthcare utilization are more likely to be determined by parental decisions. In addition, insurance premiums are also more likely to be paid by parents. Finally, 4948 individuals were selected for analysis after excluding 144 individuals for whom information on PHI disclosure or outpatient healthcare utilization was missing.

Variables

Exposure: Disclosure of Indemnity-Type Private Health Insurance Enrollment

The primary exposure was whether respondents disclosed their indemnity-type PHI enrollment to any outpatient healthcare

provider during the past 12 months. Disclosure status was measured using a single survey item: "In the past year, did you disclose your PHI coverage status to any healthcare provider(s) at the time of outpatient visits?" Respondents who answered "yes" were classified as disclosers, and those who answered "no" were classified as non-disclosers. The Korea Health Panel does not capture visit-specific disclosure; thus, this measure indicates whether disclosure occurred at least once during the 12-month reference period, rather than at every outpatient visit or at specific types of institutions.

Given the low disclosure rate and the possibility that individuals who disclose differ systematically in prior healthcare engagement and risk preferences, we adjusted for a broad set of sociodemographic, health status, and insurance characteristics, including prior claim experience and PHI premium level, to partially mitigate confounding by observed characteristics. However, unobserved selection into disclosure cannot be fully excluded.

Outcomes: Outpatient Visit Frequency and Average Out-of-Pocket Cost Per Visit

The primary outcomes were (1) the total number of outpatient visits and (2) the average out-of-pocket cost per visit, both measured over the same 12-month reference period as the disclosure item. Outpatient visit frequency was defined as the total number of outpatient contacts with any medical institution (clinics or hospitals) during the past year. Average out-of-pocket cost per visit was calculated at the person level as the total out-of-pocket expenditure for outpatient care divided by the total number of outpatient visits over the same period, excluding visits with zero out-of-pocket payment. Out-of-pocket expenditures included statutory copayments under the NHI and expenses for non-covered services, reflecting the portion of costs directly borne by patients and reimbursable under indemnity-type PHI.

Covariates

Based on Grossman's human capital theory and Andersen's behavioral model of health service use,[26,27] we adjusted for sociodemographic, economic, health status, health-related behavior, and PHI-related characteristics. Sociodemographic variables included gender, age group, marital status, educational attainment, and place of residence. Economic characteristics included economic activity, equivalized household income, and single-person household status. Health status variables included disability status, number of chronic conditions, presence of cancer, presence of cardio-cerebrovascular disease, self-rated health, and unmet medical needs. Health-related behaviors included smoking, alcohol consumption, and regular exercise. PHI-related variables included prior experience filing indemnity-type PHI claims and the monthly premium for indemnity-type PHI. Detailed coding and category definitions for all covariates are provided in Table S1 (Supplementary file 1).

Definition of Clinic-Level and Hospital-Level Institutions

In the Korean healthcare system, clinic-level institutions correspond to physician clinics that are predominantly independent practices operated by self-employed physicians. They provide mainly outpatient care, have few or no inpatient beds, and are reimbursed almost entirely on a fee-for-service basis, with relatively low consultation fees and weak gatekeeping functions.[23,24] Hospital-level institutions correspond to hospital-grade facilities (including general and tertiary hospitals) that employ physicians within corporate or public organizations, provide both outpatient and inpatient services, and operate under more complex organizational structures with salaried compensation and more formal internal oversight.[25] These structural and payment differences are expected to generate distinct financial incentives and constraints for providers in clinics versus hospitals.

Statistical Analysis

Descriptive analyses were conducted to compare sociodemographic, economic, health status, health-related behaviors, and PHI enrollment characteristics between respondents who disclosed their indemnity-type PHI enrollment and those who did not, using chi-square tests and *t* tests as appropriate. To analyze the association between PHI enrollment disclosure and outpatient healthcare utilization, we estimated multivariable regression models for each outcome. For outpatient visit frequency, we used negative binomial regression to account for overdispersion in the count data and to estimate incidence rate ratios (IRRs) and 95% confidence intervals (CIs).[28] For average out-of-pocket cost per visit, we employed a gamma generalized linear model with a log link function to accommodate the right-skewed distribution of cost data and to estimate multiplicative effects on mean out-of-pocket costs.[29] All models adjusted for the covariates described above. We first estimated models for outpatient utilization across all medical institutions combined. We then estimated separate models for hospital-level and clinic-level institutions to examine whether the association between disclosure and outpatient utilization differed by provider setting and institutional incentive structures. All statistical analyses were performed using Stata version 14.2 (StataCorp LP, College Station, TX, USA).

Results

Table 1 shows the baseline characteristics of the 4948 study participants by disclosure status. Of these, 4410 (89.1%) did not disclose their insurance enrollment, whereas 538 (10.9%) reported disclosure. Disclosers were more likely to be aged 35–64 years and to have prior experience filing indemnity-type PHI claims, while most other sociodemographic and health-related characteristics were similar between groups (Table 1).

Table 2 summarizes outpatient visit frequency and average out-of-pocket cost per visit by disclosure status, both of which were higher in the disclosure group.

The higher rates of prior claim experience and greater baseline utilization among disclosers indicate that they may differ from non-disclosers in ways related to healthcare engagement and risk preferences, raising the possibility of selection into disclosure.

Tables 3 and 4 present the results of multivariate analyses

Table 1. Baseline Characteristics of Study Participants by Disclosure Status of Indemnity-Type Private Health Insurance (N = 4948)

Variable	Category	Not Disclosed Insurance Enrollment (n = 4410)		Disclosed Insurance Enrollment (n = 538)	
		No.	%	No.	%
Gender					
	Female	2498	56.64	313	58.18
	Male	1912	43.36	225	41.82
Age (mean ± SD)		52.13 ± 14.77		50.93 ± 14.01	
Age group (y)					
	20-34	604	13.82	70	13.60
	35-64	2675	61.21	351	66.98
	≥65	1091	24.97	103	19.66
Marital status					
	Married	3166	71.81	405	75.28
	Separated/divorced	522	11.84	54	10.04
	Never married	721	16.35	79	14.68
Educational attainment					
	Elementary school	398	9.02	40	7.43
	Middle school	471	10.68	47	8.74
	High school	1494	33.88	171	31.78
	College or higher	2047	46.42	280	52.04
Residence					
	Other	3184	72.2	365	67.84
	Metropolitan area	1226	27.8	173	32.16
Economic activity					
	No	995	22.56	128	23.79
	Yes	3415	77.44	410	76.21
Annual household income (mean ± SD) (10k KRW)		2512.0 ± 2800.5		2601.6 ± 2717.6	
Single-person household					
	No	3865	88.44	459	87.60
	Yes	505	11.56	65	12.40
Disability					
	No	4255	96.49	528	98.14
	Yes	155	3.51	10	1.86
Number of chronic diseases					
	0	1998	45.49	220	41.98
	1	882	20.18	121	23.09
	≥2	1500	34.32	183	34.92
Cancer					
	No	4175	95.54	5,041	96.18
	Yes	195	4.46	20	3.82
Cardio-cerebrovascular disease					
	No	4180	95.65	501	95.61
	Yes	190	4.35	23	4.39
Self-rated health					
	Good	1752	42.15	221	42.50
	Fair	1917	46.11	240	46.15
	Poor	488	11.74	59	11.35
Unmet medical needs					
	No	3737	89.90	461	88.65
	Yes	420	10.10	59	11.35
Regular exercise					
	No	1791	43.08	224	43.08
	Yes	2366	56.92	296	56.92
Smoking status					
	No	2707	65.12	340	65.38
	Yes	1450	34.88	180	34.62
Alcohol consumption					
	No	727	16.49	81	15.06
	Yes	3683	83.51	457	84.94
Insurance claim					
	No	2976	68.49	257	49.33
	Yes	1369	31.51	264	50.67

Abbreviations: SD, standard deviation; KRW, Korean won.

Table 2. Outpatient Visit Frequency and Average Out-of-Pocket Cost Per Visit by Disclosure Status of Indemnity-Type Private Health Insurance (N = 4948)

Outcome Variable	Not Disclosed Insurance Enrollment (n = 4410)	Disclosed Insurance Enrollment (n = 538)
	Mean ± SD	Mean ± SD
Number of outpatient visits (per year)	16.92 ± 19.57	20.79 ± 25.94
Average out-of-pocket cost per visit (KRW)	30 147 ± 41 105	34 439 ± 32 350

Abbreviations: SD, standard deviation; KRW, Korean won.

examining the impact of disclosure of enrollment in indemnity-type PHI on outpatient healthcare utilization. Disclosure of PHI enrollment was significantly associated with increased outpatient utilization in the overall analysis. The adjusted IRR for disclosure was 1.157 (95% CI: 1.077–1.244, $P < .0001$) for visit frequency, corresponding to approximately 15.7% more outpatient visits among those who disclosed their insurance status compared with non-disclosers. Similarly, disclosure was associated with 0.145 higher log costs per visit (95% CI: 0.028–0.262, $P = .0149$), equivalent to approximately 15.6% higher per-visit costs. These associations remained statistically significant after adjustment for sociodemographic, health status, and insurance characteristics (Tables 3 and 4).

Before examining institution-stratified models, we summarized outpatient use by provider setting. In the study population, clinic-level institutions accounted for approximately 74.9% of all outpatient visits and had a mean of 13.51 visits per person per year, compared with 7.16 visits per person per year at hospital-level institutions, reflecting the predominant role of clinics in delivering routine outpatient care in Korea. On the other hand, the average out-of-pocket cost per visit was lower at clinics (23 345 KRW [Korean won]) than at hospitals (58 406 KRW) (Table S4, Supplementary file 1).

We then estimated separate models for hospital- and clinic-level institutions to examine whether the disclosure–utilization association varied by provider setting. Table 5 presents the results of multivariate analyses examining the association of disclosure of indemnity-type PHI enrollment and outpatient healthcare utilization, stratified by hospital-level and clinic-level medical institutions. The same set of control variables as in Tables 3 and 4 was included in the analyses. When stratified by institution type, the association between disclosure and utilization exhibited substantial heterogeneity. At clinic-level institutions, disclosure was significantly associated with higher visit frequency (IRR = 1.188, 95% CI: 1.096–1.287, $P < .0001$; approximately 18.8% more visits) and higher per-visit costs (coefficient = 0.189, 95% CI: 0.062–0.314, $P = .0033$;

Table 3. Adjusted Association Between Disclosure of Indemnity-Type Private Health Insurance Enrollment and Outpatient Visit Frequency (All Institutions)

Variable	IRR	95% CI	*P*
Disclosed insurance enrollment (ref = no)	1.157	1.077–1.244	<.0001

Abbreviations: ref, reference; IRR, incidence rate ratio; CI, confidence interval.
Control variables: sex, age group, marital status, educational attainment, residence, economic activity, average household income, single-person household, disability, number of chronic diseases, cancer, cardio-cerebrovascular disease, unmet medical needs, regular exercise, smoking status, alcohol consumption, insurance claim, and insurance premium.
Note: See Table S2 (Supplementary file 1) for full analysis results.

Table 4. Adjusted Association Between Disclosure of Indemnity-Type Private Health Insurance Enrollment and Average Out-of-Pocket Cost Per Visit (All Institutions)

Variable	Coefficient	95% CI	*P*
Disclosed insurance enrollment (ref = no)	0.145	0.028–0.262	.0149

Abbreviations: ref, reference; CI, confidence interval.
Control variables: sex, age group, marital status, educational attainment, residence, economic activity, average household income, single-person household, disability, number of chronic diseases, cancer, cardio-cerebrovascular disease, unmet medical needs, regular exercise, smoking status, alcohol consumption, insurance claim, and insurance premium.
Note: See Table S3 (Supplementary file 1) for full analysis results.

Table 5. Adjusted Association between Disclosure of Indemnity-Type Private Health Insurance Enrollment and Outpatient Services Utilization by Institution Type (Hospital-Level vs. Clinic-Level)

		Number of Outpatient Visits			Average Out-of-Pocket Cost Per Visit		
		IRR	95% CI	*P*	Coefficient	95% CI	*P*
Hospital level	Disclosed insurance enrollment (ref = no)	1.010	0.903–1.130	.8536	0.007	-0.187–0.202	.9422
Clinic level	Disclosed insurance enrollment (ref = no)	1.188	1.096–1.287	<.0001	0.189	0.062–0.314	.0033

Abbreviations: ref, reference; IRR, incidence rate ratio; CI, confidence interval.
Control variables: sex, age group, marital status, educational attainment, residence, economic activity, average household income, single-person household, disability, number of chronic diseases, cancer, cardio-cerebrovascular disease, unmet medical needs, regular exercise, smoking status, alcohol consumption, insurance claim, and insurance premium.
Note: See Tables S5 and S6 (Supplementary file 1) for full analysis results.

roughly 20.8% higher costs per visit). In marked contrast, at hospital-level institutions, disclosure was not significantly associated with visit frequency (IRR = 1.010, 95% CI: 0.903–1.130, $P = .8536$) or per-visit costs (coefficient = 0.007, 95% CI: -0.187–0.202, $P = .9422$). This differential institutional response provides empirical evidence of heterogeneity in how providers respond to patients' insurance information across organizational contexts (Table 5).

Discussion

Our findings show that disclosure of indemnity-type PHI enrollment is associated with higher outpatient visit frequency and higher average out-of-pocket cost per visit, particularly at clinic-level institutions. These patterns are consistent with conditions under which provider-induced demand might arise, in that information about reduced financial barriers coincides with increased service volume and intensity in settings characterized by strong fee-for-service incentives. However, our cross-sectional design and the use of a single, patient-reported disclosure item do not allow us to directly observe providers' awareness of disclosure, their clinical decision-making processes, or intent. As such, the results should not be interpreted as definitive causal evidence of provider-induced demand.

Alternative patient-side mechanisms may also contribute to the observed associations between disclosure and higher outpatient utilization. Patients who choose to disclose their insurance coverage may be more proactive in seeking care, more accepting of physician recommendations when financial barriers are perceived to be lower, or more motivated to use services in ways that facilitate insurance claims. Disclosers in our sample also had a higher prevalence of prior claim experience and greater unadjusted utilization than non-disclosers, suggesting that they may differ systematically in health-seeking preferences or engagement with the healthcare system. Because the Korea Health Panel does not capture visit-level disclosure or detailed information on patients' motivations and attitudes, we cannot empirically separate these patient-side pathways from provider-side responses.

Increases in healthcare utilization vary by type of medical institution. Associations with utilization are statistically significant only at the clinic level, not at the hospital level. The differential associations across institution types are consistent with theoretical predictions about organizational incentives. Clinic-level institutions, typically operated as independent practices with direct revenue-to-income linkage, may create stronger economic incentives for volume expansion when providers perceive lower cost barriers for insured patients.[23,25,30] The absence of a statistically significant association between disclosure and outpatient utilization at hospital-level institutions warrants careful consideration. One plausible explanation is that individual physicians in hospitals face weaker direct financial incentives to expand outpatient service volumes when they are salaried employees within larger organizations and subject to more formal oversight.[25,31] Differences in case mix and disease severity between hospital and clinic patients may also limit the scope for variation in outpatient care associated with patients' insurance information. In addition, any disclosure-related increase in hospital utilization may occur in inpatient rather than outpatient settings, implying a potential substitution from outpatient to inpatient care that we are unable to examine with the available data. Because we lack detailed information on inpatient utilization, clinical severity, or internal hospital compensation arrangements, these explanations remain speculative and highlight the need for future research using longitudinal and provider-level data.

The findings of this study are consistent with prior research documenting higher healthcare utilization among indemnity-type PHI subscribers compared with uninsured or NHI-only individuals.[6-10] These prior studies have typically attributed observed increases to patient-side moral hazard—reduced cost sensitivity resulting from insurance coverage. Our study extends this literature by explicitly examining whether providers' responses to patients' insurance information contribute to observed differences in utilization.

Several domestic and international studies have examined the relationship between payment incentives and provider behavior. Domestic research documents that service volume increases in settings with performance-based compensation and high market competition, particularly in private hospitals.[13,15] International evidence similarly demonstrates provider responsiveness to financial incentives: as noted in the introduction, fee increases have been shown to increase service volumes across diverse healthcare systems.[16,17] While extant research has focused on changes in payment structures, our findings extend the literature by examining how patient-provided information about insurance status influences provider behavior—a distinct mechanism operating at the point of care.

As designed, our multivariate regression analyses incorporate key control variables to minimize potential patient-side moral hazard. First, to control for moral hazard arising from learning effects through repeated use of indemnity-type PHI (ie, repeated reimbursement experiences), we included respondents' experience filing insurance claims as a control variable. This approach reflects the notion that individuals who have filed claims more frequently under the same insurance plan may perceive lower economic barriers to healthcare utilization, which, in turn, can influence their utilization behavior. Second, to reduce heterogeneity stemming from differences in coverage scope and benefit levels across PHI products, we controlled respondents' monthly insurance premiums. Insurance premiums serve as a proxy for the effective level of coverage and risk pooling, thereby allowing us to adjust to differences in healthcare utilization attributable to variation in insurance generosity across insurers and plans. By controlling these factors, we aimed to minimize patient-side moral hazard effects and more precisely identify the extent to which disclosure of indemnity-type PHI enrollment influences providers' treatment decisions.

This study contributes to the literature on provider-induced demand and health insurance in three ways. First, it is among the few studies using nationally representative data to examine the association between patients' disclosure of PHI status and provider-level service provision. Second, stratifying

analyses by institution type reveals structural differences in organizational incentives that moderate provider responses to insurance information. Third, the findings are policy-relevant for Korea's indemnity-type PHI system, suggesting a particular need for monitoring mechanisms at the clinic level. Given the cross-sectional design and indirect inferences about provider behavior, however, findings should be viewed as hypothesis-generating rather than definitive evidence of intentional provider-induced demand.

This study has several limitations that should be considered when interpreting the findings. First, disclosure of PHI enrollment was measured with a single self-reported item assessing whether respondents disclosed their coverage status to any outpatient provider in the past year. The measure does not identify the timing, frequency, or setting of disclosure (clinic versus hospital). Consequently, some individuals who disclosed only in hospitals may be classified as "disclosers" in the clinic-level analysis, and vice versa, leading to potential differential misclassification of exposure in institution-specific models. Second, disclosure was treated as a fixed, person-level exposure rather than a time-dependent, visit-specific variable because the Korea Health Panel does not collect visit-level disclosure information. Third, only 10.9% of respondents reported disclosure, and disclosers differed from non-disclosers in several observed characteristics, including prior claim experience and baseline utilization, suggesting that they may have stronger health-seeking preferences, higher risk awareness, or more experience navigating insurance processes than non-disclosers. Although we adjusted for a wide range of covariates, residual confounding and selection bias related to unobserved health-seeking preferences or risk tolerance may still influence the estimated associations. Fourth, our cost outcome captured the average out-of-pocket cost per visit, including statutory copayments and non-covered services, rather than total medical expenditure per visit. We chose out-of-pocket costs because indemnity-type PHI in Korea is specifically designed to reimburse patients for out-of-pocket spending, and thus patient cost-sharing is the component most directly affected by PHI and most salient to both patients and providers. However, we were unable to routinely construct comparable measures of total outpatient charges, and our findings do not address whether disclosure is associated with changes in total resource use from the payer perspective. Finally, the cross-sectional design precludes strong causal inference. The observed associations between disclosure and higher utilization should be interpreted as hypothesis-generating and require confirmation using longitudinal or experimental designs that can more clearly separate patient-side and provider-side mechanisms.

Conclusion

In conclusion, disclosure of indemnity-type PHI enrollment is associated with higher outpatient visit frequency and higher average out-of-pocket cost per visit among Korean adults, with these associations concentrated at the clinic level. These patterns suggest that information about patients' insurance coverage may interact with fee-for-service incentives to encourage greater outpatient use in certain settings. However, given the cross-sectional design and the patient-reported, person-level disclosure measure, the findings should be interpreted as associative rather than causal evidence of provider-induced demand. Future longitudinal and provider-level studies are needed to disentangle patient-side and provider-side mechanisms and to more directly assess how providers respond to information about patients' insurance coverage.

From a policy perspective, these hypothesis-generating findings point to several possible directions rather than immediate interventions. If future longitudinal or experimental research confirms that provider responses to insurance information contribute to unnecessary outpatient utilization, potential options could include enhanced monitoring by private insurers of outpatient volume and per-visit cost patterns in clinic-level settings, strengthened peer review and professional ethics guidance regarding appropriate service volumes, and improved patient information and consent about the necessity and financial implications of non-covered services. Further work integrating patient-level survey data, provider characteristics, clinical records, and insurance claims will be essential to better distinguish provider-induced from clinically appropriate utilization and to design policy instruments that target the most problematic forms of overuse without undermining access to necessary care.

Disclosure of artificial intelligence (AI) use

Section(s) of manuscript affected: Introduction and Discussion.
Type of AI tool(s) used: ChatGPT.
Purpose of use: Language editing and improving grammar.

Ethical issues

This study was approved by the Institutional Review Board (IRB) of The Catholic University of Korea Songeui Campus (MC25ZASI0109). The study analyzed deidentified data from a nationally representative panel survey. For secondary analysis of deidentified survey data, the IRB waived the requirement for obtaining informed consent from participants. All data were provided in a fully deidentified format, and the authors did not have access to any information that could identify individual participants.

Conflicts of interest

Authors declare that they have no conflicts of interest.

Authors' contributions

Conceptualization: Chang Hoon You, Sungwook Kang, and Young Dae Kwon.
Data curation: Chang Hoon You.
Formal analysis: Chang Hoon You.
Funding acquisition: Young Dae Kwon.
Methodology: Chang Hoon You, Sungwook Kang, and Young Dae Kwon.
Writing–original draft: Chang Hoon You and Sungwook Kang.
Writing–review & editing: Young Dae Kwon.

Data availability statement

The data that support the findings of this study are available from Korea Health Panel Survey with permission (https://www.khp.re.kr:444/eng/main.do). However, data availability for processed data is limited because, under the Korea Health Panel Survey's bylaws, the free sharing of data between individuals is prohibited. The processed data is available upon reasonable request and with the permission of the National Health Insurance Service and the Korea Institute for Health and Social Affairs.

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Supplementary files

Supplementary file 1 contains Tables S1-S6.

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