

Assessing the Economic Impact of Leisure Loss among Korean individuals Affected by Food Poisoning

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ABSTRACT - In previous Cost-of-Illness (COI) studies, the economic impact of lost leisure time of patients has been mostly underexplored. Furthermore, few studies have focused on chronic or severe diseases, thereby inadequately addressing the segment of self-care patients who do not fall into the categories of inpatients or outpatients. In the present study, we used a comprehensive approach to calculate the annual cost of leisure loss, incorporating factors such as employment status, self-care options, and total period of leisure activity disruption. This required analyzing data from various sources, including health and labor statistics, and applying methods to accurately assess the leisure time lost due to food poisoning. The findings showed that the annual cost of leisure loss for South Korean patients with food poisoning is significant, amounting to approximately 784.5 billion KRW (702.8 million USD, USD/KRW : 1128.34). This study revealed that overlooking self-care patients and not accounting for the affected time in addition to treatment time and employment status significantly underestimated these costs. This study highlights the importance of considering a wider range of factors, including self-care, employment status, as well as the entire affected period, in assessing the societal impact of diseases such as food poisoning. These findings provide valuable insights for policymakers and healthcare professionals to understand the broader economic implications of illness and allocate healthcare resources more effectively.

Key words: Food poisoning, Lost leisure of patients, Economic impact, Affected time, Cost of illness

Accurate measurement of the social costs incurred by diseases are critical in determining how diseases impact society and to what extent we can afford the costs of efforts to prevent them. Researchers in the medical and health field have used the cost of illness (COI) to evaluate the economic costs arising from particular diseases. COI helps inform the public and policymakers about the relative importance of certain diseases and injuries. Therefore, it has been studied for a variety of diseases including Alzheimer's^{1,2}, cancer³⁻⁵, Parkinson's⁶, diabetes mellitus⁷, food poisoning^{8,9} back injuries¹⁰, and depression^{11,12}.

Researchers seeking to accurately estimate the social costs of a particular disease should consider all the economic costs patients incur while suffering disease. Patients spend both time and money to cure diseases. The time includes all hours sacrificed due to illness—not just hospital visits and

hospitalization, but also lost time for work, housework, social fellowship, community service, and leisure^{13,14}. Accordingly, previous COI studies have included various direct and indirect costs to examine the broader social impacts of disease outbreaks. The direct cost comprises medical expenses and non-medical costs, including transportation to and from medical facilities, home care, uninsured medical supplies, and related expenses. The indirect cost includes productivity loss, morbidity/mortality costs, intangible costs, and impact on caregivers. Intangible costs encompass the pain, suffering, and emotional distress endured by individuals and their families as a result of the disease.

In COI research, the cost of lost leisure has received comparatively less attention than lost productivity and informal family care, and therefore rigorous analysis on it has been elusive¹⁵. Among the 878 current COI articles we have identified, only seven have included patients' lost leisure in deriving the total costs of illness, and these studies were conducted relatively recently^{3,16-21}. This highlights limited research interest in patients' leisure loss costs, particularly in the context of its recent emergence.

In this research, our main goal was to estimate the indirect costs associated with patients' leisure loss, emphasizing key

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factors contributing to a more accurate estimation of these costs. We distinguish our approach in deriving leisure loss costs from existing COI studies as follows. First, we compute leisure loss costs for food poisoning patients, unlike previous studies that have primarily concentrated on chronic or severe diseases, such as those by the the Canadian Burden of Illness Study Group¹⁶⁾ on Multiple sclerosis, Findley¹⁷⁾ on Parkinson's, Yabroff et al.³⁾ on Cancer, Guerriere et al.¹⁸⁾ on Cystic fibrosis, Chatterjee et al.¹⁹⁾ on Diabetes, Rudmik et al.²⁰⁾ on Refractory chronic rhinosinusitis, and Barral et al.²¹⁾ on Ischemic stroke. In the context of food poisoning, some individuals with mild symptoms may opt for self-care, including purchasing over-the-counter (OTC) medication from a pharmacy or recovering at home without hospitalization. We categorize patients in this case as "self-care patients." Therefore, we encompass not only outpatients and inpatients but also self-care patients. As a result, this study stands as the first to explicitly consider self-care patients when measuring leisure loss costs. Second, we implement the concept of "affected time" in place of "treatment time" for diseases, aiming to encompass the entire period when an individual is unable to engage in leisure activities. Ongoing physical discomfort or psychological instability post-treatment can hinder leisure enjoyment, potentially prolonging affected periods beyond treatment time. Affected time therefore encompass the duration individuals cannot partake in leisure activities despite completion of treatment. Third, we differentiate between weekday and holiday leisure time for both working and non-working patients, enhancing the precision of estimating leisure loss costs compared to prior studies that did not account for this distinction.

This study aims to delve into the relatively less explored domain of leisure loss costs within indirect costs, providing insights for more precise total cost of illness estimates. We employ this concept to quantify the extent of leisure loss costs incurred in a specific disease in a country, namely food poisoning in South Korea. Furthermore, this study formulates a guideline for incorporating the costs related to patients who, despite being aware of their symptoms, refrain from seeking hospital care when calculating the cost of illness. Notably, by considering self-care patients, affected time, and the worker/non-worker divide, we highlight potential underestimations found in previous study results. This approach is applicable not only to leisure loss costs but also to other indirect costs associated with diseases.

Materials and Methods

Theoretical Background

Most COI studies focused on direct costs, with fewer

addressing indirect costs. Table 1 lists the identified studies that incorporated patients' leisure loss costs and outlines their methodologies. These studies presented in the table calculated lost leisure costs by correlating illness treatment time with worker or household caregiver wages. Among them, Findley¹⁷⁾ and Barral et al.²¹⁾ identified and estimated sacrificed leisure costs. The remaining studies assessed various indirect costs simultaneously, including the time lost for housework, work, and leisure activities during disease treatment. None of the seven studies took into account the extended duration of affected time alongside treatment period. Furthermore, Guerriere et al.¹⁸⁾ was the sole study that addressed the differentiation between employed and unemployed patients, while Rudmik et al.²⁰⁾ exclusively explored the distinction between weekdays and holidays. The studies did not consider self-care patients due to the characteristics of the diseases they analyzed. In summary, research that considers self-care patients and the entire duration of impact, and distinguishes between employed and unemployed patients is exceedingly scarce in the studies that have estimated patients' leisure loss costs.

Estimation Method

We define leisure as a quality of experience as free time, following Kelly²²⁾. Free time involves being away from business, work, job hunting, domestic chores, education, and necessary activities such as eating and sleeping. Leisure activities include hobbies, sports, arts, entertainment, travel, socializing, or other pursuits that people find enjoyable and fulfilling. The cost of lost leisure pertains to the valuation or monetary worth assigned to the time that individuals or societies give up for leisurely pursuits when they involve themselves in alternate activities like employment, responsibilities, or addressing illnesses^{16,23)}. In essence, it represents the opportunity cost of not spending that time on leisure activities.

Food poisoning is caused by ingesting contaminated or spoiled food, leading to illness and gastrointestinal symptoms Alcock²⁴⁾. Following world health organization (WHO), it is characterized by harmful microorganisms (bacteria, viruses, parasites) or their toxins in the food, which can cause various health issues when consumed.

We used the calculation method presented in Equation 1 to derive the cost of leisure loss for food poisoning patients.

$$c_{ll} = \left(\begin{array}{l} \sum_{i=2}^6 (dlleo_i \times lte_i \times wage) + \sum_{i=2}^6 (dllei_i \times lte_i \times wage) \\ \sum_{i=2}^6 (dllee_i \times lte_i \times wage) + \sum_{i=2}^7 (dllnes_i \times ltne_i \times wage) \\ \sum_{i=2}^7 (dllnei_i \times ltne_i \times wage) + \sum_{i=2}^7 (dllnes_i \times ltne_i \times wage) \end{array} \right) \quad (1)$$

where c_{ll} is the cost of leisure loss. i ranges from 1 to 7, denoting each age group—under 20, 20s, 30s, 40s, 50s, 60s, and 70s and over, respectively. For workers, i ranges from 2

Table 1. Methods used to estimate forfeited leisure costs in prior research

Study	Range of indirect cost	Method of derivation	A ¹⁾	B ²⁾	C ³⁾	D ⁴⁾
Canadian Burden of Illness Study Group ¹⁶⁾	Measured foregone time for unpaid functions that include housework, education, and leisure	Total treatment time except for work \times average wage of Canadian workers	No	No	No	No
Findley ¹⁷⁾	Measured foregone time only for leisure	Time of leisure loss \times minimum wage of English workers	No	No	No	No
Yabroff et al. ³⁾	Measured foregone time for work and leisure	Treatment time \times median wage of American workers	No	No	No	No
Guerriere et al. ¹⁸⁾	Measured only for non-working patients' housework and leisure. For employed patients, measured cost of productivity loss and foregone leisure	Treatment time care except for work \times average wage of housekeepers	No	Yes	No	No
Chatterjee et al. ¹⁹⁾	Measured foregone time for work and leisure	Treatment time \times minimum wage of the province	No	No	No	No
Rudmik et al. ²⁰⁾	Measured foregone time for housework and leisure	Treatment time \times the average wage of housekeepers	No	No	Yes	No
Barral et al. ²¹⁾	Defined leisure as time except for housework and volunteer time Measured only for retired or unemployed patients. For employed patients, measured cost of productivity loss	Treatment time \times minimum wage of French workers	No	No	No	No

1) A denotes whether the study considered extended affected time in addition to treatment time. 2) B denotes whether the study distinguished between workers and non-workers. 3) C denotes whether the study differentiated between weekdays and holidays. 4) D denotes whether the study analyzed costs for self-care patients.

to 6, and for non-workers, i ranges from 1 to 7. That is, we excluded the “under 20” and “70s and over” age groups for the working group. $dlleo$, $dllei$, $dlles$, $dllneo$, $dllnei$ and $dllnes$ are the annual total affected times for employed outpatients, employed inpatients, employed self-care patients, unemployed outpatients, unemployed inpatients, and unemployed self-care patients, respectively. Inpatients are those who stay in a hospital for a certain period due to acute food poisoning, while outpatients have relatively mild symptoms and come for a first visit or treatment. For outpatients and inpatients, national statistics offer data on both the number of patients and the duration of their hospital visits or hospitalizations. However, considering all days of hospital visits or hospitalizations as treatment time poses a problem. For instance, when an outpatient experiences food poisoning symptoms in the evening, seeks hospital care, recovers overnight, and returns the following day for a check-up, it becomes problematic to label the entire two-day period as treatment time. Another example is when an inpatient is discharged early in the morning; including the entire day as part of the treatment duration would not be considered a precise calculation. Therefore, it is preferable for both inpatients and outpatients to derive the treatment time by inquiring when they initially experienced symptoms during the day, the number of hospital visits or the duration of their hospitalization, and ultimately, when their symptoms ceased

or when they were discharged from the hospital. This approach is preferable to relying solely on the total number of days of hospital visits or hospitalization. Similarly, one can inquire about the duration of self-care for those who did not visit the hospital even if they experienced symptoms of food poisoning. By including the time taken to resume leisure activities after recovery in the derived treatment time, it becomes feasible to estimate the affected time.

lte and lme denote the average daily leisure time for working and non-working patients, respectively. In previous studies, researchers assumed that non-working hours were equivalent to the time available for leisure or housework/leisure activities. This approach has the potential to introduce bias when estimating the average amount of leisure time lost on treatment days for diseases. In contrast, we relied on data from national statistics to calculate the average leisure time. $wage$ is the minimum wage in South Korea. Hence, the first through last terms on the right side denote the yearly overall leisure loss cost for employed and unemployed inpatients, outpatients, and self-care patients. In each term, we combine the average daily leisure time with the average minimum wage and the total affected days.

Workers and non-workers naturally have different average leisure times, with people typically enjoying more leisure on holidays than on weekdays. Therefore, we assume that workers experience more leisure on holidays compared to weekdays,

while non-workers have more weekday leisure than workers, with no difference in leisure time between the two groups on holidays. We multiplied the country's employment rate of each age group by the total affected days of the same group to derive the annual total affected days for workers ($dlleo_i$, $dllei_i$, and $dlles_i$). We then subtracted the workers' annual total affected days from each age group's annual total affected days to derive the annual total affected days for non-workers ($dllneo_i$, $dllnei_i$, and $dllnes_i$).

Data

We extracted the number of patients who visited hospitals due to food poisoning from the Health Insurance Review and Assessment Service of South Korea²⁵). The dataset classifies diseases using the Korean Standard Classification of Diseases (KCD7) codes. As of 2018, KCD7 contained 41 codes for food poisoning-related diseases. Using the selected codes, we derived the number of food poisoning outpatients and inpatients.

We utilized data from a survey conducted by the Ministry of Food and Drug Safety in Korea to evaluate the quantity of self-care patients and calculate the average affected time for each patient category. The survey occurred between September 29 and October 15, 2020, and focused on individuals diagnosed with food poisoning between 2016 and 2018. Research company Macromill Embrain (www.embrain.com) commissioned the survey. The company collected samples from its nationwide online panel. We used data for 2,836 respondents, excluding 164 unfaithful respondents from the 3,000 total. The survey included information about self-care or hospital visits due to food poisoning, hospitalization status, and duration. Respondents provided data for each case to accommodate multiple incidents within a year. They supplied data on self-care and outpatient hospital visits, covering home stay, travel time to pharmacies or hospitals, and recovery duration. If hospitalized, they noted admission-to-discharge time and round-trip travel time. Respondents used four units per day for approximate timings. The questionnaire also addressed the resumption of leisure activities post-treatment, with an inquiry about any associated delay and its duration.

Table 2 shows the number of food poisoning patients and the number of hospital visits. The aforementioned survey revealed that 6.95% of Koreans experienced food poisoning

but did not visit hospitals. We applied the percentage to the total national population from 2016 to 2018 to estimate the number of self-care patients.

We used data from the Economically Active Population Survey²⁶) for the employment rate. We also derived South Korea's average leisure activity hours from the National Leisure Activity Survey²⁷) provided by the Ministry of Culture, Sports, and Tourism of Korea. The National Leisure Activity Survey²⁷) reports that, from 2016 to 2018, the average leisure activity time for South Koreans was 3.35 hours on weekdays and 5.29 hours on holidays. Notably, this survey does not differentiate leisure time based on employment status. In our analysis, we assume that for working patients, their weekday and holiday leisure time matches the average leisure time. Conversely, for non-workers, we apply the average holiday leisure time to both weekdays and holidays. Studies by Fireston²⁸) and Bittman and Wajcman²⁹) suggest that non-workers have more leisure time than workers and similar leisure time on weekdays and weekends.

Results

The survey showed that on average, outpatients took 1.19 days for treatment and 1.53 days to resume leisure activities after recovering from food poisoning. Inpatients took 2.82 days for treatment and 0.65 days to resume leisure activities, while self-care patients took 1.30 days for treatment and 0.77 days to resume leisure activities. Consequently, the average affected time was 2.72 days for outpatients, 3.47 days for inpatients, and 2.07 days for self-care patients. The leisure-to-treatment delay ratio was higher for outpatients compared to inpatients. This difference arises probably because inpatients are discharged by doctors upon recovery assessment, while outpatients gauge their recovery independently.

We calculated the annual total affected days for each patient group by multiplying the average affected days by the respective number of patients. For working patients aged 20 to 60, we also factored in their employment rates. The affected days for non-working patients were determined by subtracting the affected days of working patients from the total. We then multiplied these figures by the average daily leisure time for both working and non-working patients, along

Table 2. The total number of food poisoning patients and their hospital visits per year

Year	Number of outpatients	Number of inpatients	Estimated number of self-care patients
2018	5,138,257	188,175	3,588,251
2017	5,049,720	195,871	3,573,864
2016	5,298,107	195,853	3,563,234

Table 3. Estimated value of leisure loss for each age group in South Korea: the average from 2016 to 2018

Classification	Age group	Workers		Non-workers		Total	
		KRW	USD	KRW	USD	KRW	USD
Outpatients	15-19	0	0.0	186,074	167.6	186,074	167.6
	20's	27,200	24.1	28,760	25.9	55,960	50.4
	30's	30,578	27.1	14,380	12.9	44,958	40.5
	40's	32,406	28.7	11,997	10.8	44,402	40.0
	50's	35,975	31.9	16,749	15.1	52,723	47.5
	60's	17,813	15.8	34,366	30.9	52,179	47.0
	70 and over	0	0.0	56,440	50.8	56,440	50.8
	Subtotal	143,972	127.8	348,764	314.1	492,736	443.7
Inpatients	15-19	0	0.0	10,471	9.4	10,471	9.4
	20's	1,245	1.1	1,317	1.2	2,562	2.3
	30's	1,204	1.1	567	0.5	1,771	1.6
	40's	1,215	1.1	450	0.4	1,664	1.5
	50's	1,485	1.3	692	0.6	2,176	2.0
	60's	676	0.6	1,304	1.2	1,980	1.8
	70 and over	0	0.0	3,459	3.1	3,459	3.1
	Subtotal	5,824	5.2	18,260	16.4	24,084	21.7
Self-care patients	15-19	0	0.0	104,719	92.8	104,719	92.8
	20's	13,282	11.8	13,905	12.4	27,187	24.2
	30's	15,813	14.0	7,358	6.5	23,171	20.6
	40's	17,276	15.3	6,362	5.6	23,638	21.0
	50's	20,779	18.4	9,173	8.1	29,952	26.6
	60's	10,712	9.5	19,153	17.0	29,865	26.5
	70 and over	0	0.0	29,119	25.9	29,119	25.9
	Subtotal	77,862	69.1	189,789	168.3	267,651	237.4
Total	227,658	202.0	556,813	498.8	784,471	702.8	

Units of measure are million KRW (Korean won) and million USD (United States dollar), USD/KRW : 1128.34.

with the minimum wage of the country. Table 4 presents the estimated costs of leisure activity loss for food poisoning patients in South Korea.

Discussion

We combined three factors: self-care patients, affected time, and working status. This study emphasizes that previous calculation methods might have underestimated the cost of patients' leisure loss. Table 4 illustrates this underestimation. While keeping all other conditions the same as the model specification and assumption in Equation 1, model (1) excludes self-care patients and model (2) employs treatment time instead of affected time. Model (3) considers all patients as employed, irrespective of their employment status. Model (4) combines specifications from Models (2) and (3). Lastly,

Model (5) integrates features from Models (1), (2), and (3).

The results demonstrate that the estimated values for all three scenarios were lower than the original estimates. These results that neglecting self-care patients, affected days, and working status would lead to underestimated leisure loss costs. The underestimation can be even more pronounced when these factors are combined.

Table 5 compares our results to those of the seven studies. Values differ by the diseases analyzed, when the researcher measured the values, the level of wages in that region at the time, and factors included other than leisure. Due to variations in the total number of patients across studies, we calculated the cost of leisure loss per individual for all studies to facilitate the comparison. Due to varying disease durations and severity levels, precise direct comparisons are challenging. Hence, we focused on relative magnitudes rather than exact

Table 4. Sensitivity test of estimated results

Classification	Age group	Figures in Table 3	(1) Not including self-care patients	(2) Not reflecting "affected time"	(3) Not differentiating workers vs. non-workers	Merging case (2) and case (3)	Merging case (1), case (2), and case (3)
Outpatients	15-19	186,074	186,074	81,407	125,168	54,761	54,761
	20's	55,960	55,960	24,482	46,991	20,559	20,559
	30's	44,958	44,958	19,669	40,618	17,770	17,770
	40's	44,402	44,402	19,426	40,907	17,897	17,897
	50's	52,723	52,723	23,066	47,977	20,990	20,990
	60's	52,179	52,179	22,828	44,675	19,545	19,545
	70 and over	56,440	56,440	24,692	50,171	21,950	21,950
	Subtotal	492,736	492,736	215,572	396,508	173,472	173,472
Inpatients	15-19	10,471	10,471	8,510	7,048	5,728	5,728
	20's	2,562	2,562	2,082	2,151	1,748	1,748
	30's	1,771	1,771	1,439	1,600	1,300	1,300
	40's	1,664	1,664	1,352	1,533	1,246	1,246
	50's	2,176	2,176	1,768	1,980	1,609	1,609
	60's	1,980	1,980	1,609	1,695	1,377	1,377
	70 and over	3,459	3,459	2,811	3,074	2,498	2,498
	Subtotal	24,084	24,084	19,572	19,081	15,506	15,506
Self-care patients	15-19	104,719	-	65,629	71,177	44,608	-
	20's	27,187	-	17,039	22,945	14,380	-
	30's	23,171	-	14,522	21,003	13,163	-
	40's	23,638	-	14,814	21,807	13,667	-
	50's	29,952	-	18,771	27,715	17,369	-
	60's	29,865	-	18,717	26,876	16,844	-
	70 and over	29,119	-	18,249	23,563	14,767	-
	Subtotal	267,651	-	167,741	120,346	75,423	-
	Total	784,471	516,820	402,886	535,935	264,402	188,979
Ratio vs. original estimates		1	0.659	0.514	0.683	0.337	0.241

The numbers in each cell reflect millions of Korean won (KRW).

Table 5. Comparison between the estimated cost per person and findings from previous studies

Studies	Target country, Target sample	Disease	Range of activities	Target period	Number of patients for target period	Total cost, cost per person
This study	South Korea, All patients in the country	Food poisoning	Only leisure	A year	8,930,444	702.8 million USD, 78.70 USD
Findley ¹⁷⁾	United Kingdom, Surveyed sample	Parkinson	Only leisure	A year	423	5,829 £, 20.67 USD
Barral et al. ²¹⁾	France, Surveyed sample	Ischemic stroke	Only leisure	The first post-stroke year	163	2,389 €, 17.24 USD
Guerriere et al. ¹⁸⁾	Canada, Surveyed sample	Cystic fibrosis	Housework, leisure	28 days	110	133,848 CAD, 968.81 USD
Rudmik et al. ²⁰⁾	United States, Surveyed sample	Refractory chronic rhinosinusitis	Housework, leisure	A year	55	1,927 USD, 35.04 USD
Yabroff et al. ³⁾	United States, All patients in the country	Cancer	Work, leisure	First 12 months of patients	763,527	2.3 billion USD, 3,012 USD
Chatterjee et al. ¹⁹⁾	Thailand, Surveyed sample	Diabetes	Work, leisure	October 2007 to September 2008	475	5,332 USD, 11.23 USD
Canadian Burden of Illness Study Group ⁶⁾	Canada, Surveyed sample	Multiple sclerosis	Includes housework, education, leisure	A year	198	713.8 million CAD, 45,425 USD

The average exchange rates were 1 USD = 0.85 € in 2021, 1 USD = 1.26 CAD in 1998, and 1 USD = 0.5 £ in 2007.

figures.

Our findings reveal a per-patient cost of 78.70 USD, notably surpassing the estimates of Findley¹⁷⁾ and Barral et al.²¹⁾, who also isolated leisure cost from other indirect costs. Furthermore, this figure exceeds the outcomes of research that calculated costs by amalgamating leisure, work, or household tasks, such as Rudmik et al.²⁰⁾ and Chatterjee et al.¹⁹⁾. The remaining three studies, Canadian Burden of Illness Study Group⁶⁾, Yabroff et al.³⁾, and Guerriere et al.¹⁸⁾, showed higher values than ours, as they estimated indirect costs by including household chores, work, or even education in their calculations. This comparison strongly indicates the possibility of underestimation, offering valuable insights when precise determination of societal costs is crucial.

Moreover, we employed Korea's minimum wage; the value would have increased if we used the average wage. Across our estimation period, the average wage was 2.3 times the minimum wage in the country. Applying this ratio to our study's estimation would elevate the per-patient cost to 181.0 USD. Consequently, using the average worker wage would accentuate this underestimation issue.

Conclusion

In this study, we assessed the indirect costs related to leisure time loss among food poisoning patients in South Korea, with a novel approach that includes self-care patients as well as inpatients and outpatients. Unlike previous studies that focused mainly on chronic or severe illnesses, we expanded our scope to cover the entire period during which individuals are unable to participate in leisure activities due to food poisoning. By distinguishing between working and non-working patients, we accounted for differences in leisure time during weekdays and holidays. This approach leads to more accurate estimates of the total Cost of Illness, indicating that earlier studies might have undervalued the costs of leisure loss for patients.

The findings of this paper are both academically and practically significant. First, the results underscore the growing importance of leisure in health economics. Researchers should strive for more precise methods to evaluate the loss of leisure time for patients, in line with the argument by Koopmanschap and Van Ineveld³⁰⁾ about the need for accurate economic evaluations to guide efficient healthcare resource allocation. Second, the study presents a holistic view of the impact of food poisoning, including indirect leisure loss costs in addition to conventional direct cost of disease. This comprehensive perspective is essential for policymakers and healthcare providers to fully grasp the economic burden of food poisoning. Third, the focus on the substantial costs associated with leisure loss in South Korea

due to food poisoning highlights the urgent need for more effective food safety and public health measures. Lastly, our research is important for estimating indirect costs in the COI framework, especially in cases where patients do not seek hospital care or in diseases where the affected time significantly exceeds treatment time.

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국문요약

기존 질병비용연구(COI)에서 환자의 여가시간 손실에 따른 경제적 영향은 상대적으로 적은 관심을 받아왔다. 또한, 기존연구들은 주로 만성질환 또는 중질환에 초점을 맞췄으며, 이로 인해 입원환자나 외래환자가 아닌 상대적으로 증상이 약한 자가치료환자들에 대해서는 충분히 다루지 못했다는 한계를 가지고 있다. 이에 본 연구에서는 자가치료 환자들을 포함하고, 더 나아가 고용 상태와 실제 여가활동 중단 기간 등을 고려하여 식중독으로 인한 여가손실의 연간 비용을 계산하였다. 이 과정에서 건강과 노동에 관한 통계 자료를 활용하고, 식중독으로 인한 여가손실을 정확히 평가하는 방법을 제시하였다. 연구 결과, 국내에서 식중독으로 인한 여가 손실에 따른 연간 경제적 비용은 약 7,845억 원(7억 2,800만 USD)으로 나타났다. 본 연구에서는 자가 치료 환자들을 포함하지 않거나 치료 시간과 고용 상태를 고려하지 않은 경우, 여가손실비용이 낮게 추정될 가능성을 제시하고 있다. 즉, 식중독과 같은 질병의 사회적 영향을 평가할 때 자가 치료, 고용 상태, 그리고 영향받는 전체 기간을 포함한 다양한 요소를 고려하는 것이 중요하다는 것을 의미한다. 이 연구 결과는 정책 결정자와 의료 전문가들에게 질병의 경제적 영향을 보다 넓은 관점에서 이해하고, 보건의료 자원을 더 효과적으로 배분하는 데 도움이 될 수 있는 중요한 통찰을 제공한다.

Conflict of interests

The authors declare no potential conflict of interest.

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