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Home care program with telemonitoring for patients undergoing peritoneal dialysis in South Korea: a cost-utility analysis

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Background: The COVID-19 pandemic accelerated the use of digital health technologies to improve care access and quality of life. The Korean Ministry of Health and Welfare introduced a home care program for end-stage renal disease patients on peritoneal dialysis (PD), incorporating educational consultations and remote monitoring. This study evaluates the long-term economic effectiveness of this digital health-based home care program.

Methods: A Markov model was developed to assess the lifetime cost-effectiveness of the PD home care program. Simulations involved 1,000 patients aged 50 in a PD health state, transitioning annually. Effectiveness was measured in quality-adjusted life years (QALYs), and a cost-utility analysis was performed from a limited societal perspective. The willingness-to-pay (WTP) threshold was US$ 32,255 (gross domestic product per capita) per QALY, with a 4.5% discount rate for both QALYs and costs. Outcomes included the incremental cost-effectiveness ratio (ICER) and incremental net monetary benefit, with scenario, sensitivity, and expected value of perfect information (EVPI) analyses addressing uncertainty.

Results: The base case analysis yielded an ICER of $4,895 per QALY, well within the WTP threshold. Sensitivity analysis highlighted PD-associated costs as the most critical parameters. Monte Carlo simulations (10,000 iterations) indicated a 79.0% probability of the home care program being optimal. EVPI analysis suggested an additional $2,963 per patient with perfect parameter information.

Conclusion: The PD home care program in Korea appears to be a cost-effective strategy, potentially reducing peritonitis incidence and enhancing healthcare efficiency.

Keywords: Cost-effectiveness analysis, Home care services, Peritoneal dialysis, Remote consultation

Introduction

With the outbreak of the coronavirus disease 2019 (COVID-19), various suggestions for digital health technologies [1] have been adopted and commercialized [2,3]. In the United States, telehealth visits and remote patient monitoring claim cases have increased compared to pre-pandemic periods [4,5]. In December 2019, the Ministry of Health and Welfare of Korea initiated a home care program that included face-to-face educational consul-

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tations and remote patient monitoring [6]. This program was specifically designed for patients with end-stage renal disease (ESRD) undergoing peritoneal dialysis (PD), type 1 diabetes mellitus, heart failure, rehabilitation, tuberculosis, and others. Under the program, the medical care team remotely monitors patients regularly to increase access to medical support and encourage self-care, thereby improving patients' quality of life. Although it is difficult to establish a billable digital health policy [7] nowadays, the home care program in Korea is currently reimbursable for various diseases. To determine the cost-effectiveness of the reimbursed home care program, we focused on patients with ESRD undergoing PD.

Chronic kidney disease (CKD) refers to irreversible damage to the kidney's structure and function [8–11]. ESRD, Stage 5 CKD [12], is diagnosed when the kidneys no longer function adequately. The incidence and prevalence of ESRD in Korea in 2020 were 18,379 and 145,006, respectively, and these numbers continue to rise each year [13]. To survive with ESRD, long-term renal replacement therapy options such as hemodialysis (HD), renal transplantation (RTx), or PD become necessary [14]. As each treatment modality has its own set of advantages and disadvantages, patients and medical professionals engage in shared decision-making to select the most suitable treatment option.

PD is a renal replacement therapy that uses the peritoneum as a natural filter to remove waste products and excess fluids from the body. In 2020, the population undergoing PD in Korea was reported to comprise 3.9% (5,724 patients) of all patients with ESRD [13]. PD can be performed by patients at their homes and does not necessitate a hospital visit for the procedure, making it an appealing option for certain patients. However, patients may hesitate to undergo PD due to concerns about the need for self-care and the potential risk of infections associated with catheter insertion or peritonitis, a common complication of PD [15,16]. Given the existing healthcare gap for PD patients, the implementation of a home care program with digital health services is expected to address this issue by filling medical gaps. It is imperative to evaluate the long-term clinical and economic effectiveness of the newly introduced home care program with telemonitoring services to determine whether it represents a worthwhile societal investment.

In South Korea, total healthcare expenditure increased by 10.2% in 2021 [17], and Medicare-related expenditures for ESRD in the United States saw a 13.3% increase [18]. Previous studies have explored the cost-effectiveness of various renal replacement therapies, including HD, RTx, and PD, for patients with ESRD [19–21]. PD is considered a cost-effective alternative that requires fewer human resources, leading to reduced labor costs, especially in developed countries. While the recently initiated home care program for PD patients is generally perceived as affordable, its cost-effectiveness requires further investigation to determine its societal impact in reducing healthcare expenditures and to assess the program's sustainability.

Our study demonstrated the effectiveness of a home care program for PD patients by evaluating its lifetime cost-effectiveness. Through this study, we aimed to establish the cost-effectiveness of telemonitoring for PD patients, providing a rationale for implementing the digital health program and potentially expanding it to other medical conditions.

Methods

Study design

Study population

Our study involved Korean patients with ESRD undergoing PD to evaluate the cost-effectiveness of the newly introduced PD home care program. For cohort simulation, we created a hypothetical cohort of 1,000 patients with PD aged 50 years.

Model structure

We developed a Markov model to assess the lifelong cost-effectiveness of the PD home care program. The model, represented in Fig. 1, comprises five health states (PD, peritonitis, HD, RTx, and death), as established in prior studies [19–24] and informed by clinical input from our hospital. The Markov structure was created using TreeAge Pro 2022 and R2 software (TreeAge Software). Cohorts of 1,000 patients initiated from the PD health state and underwent state transitions at each cycle. Background mortality rates were incorporated into all Markov cycles, based on nationwide Korean population statistics [25] and the number of deaths [26] in 2021 (Supplementary Table 1, available online). By leveraging the memoryless property of the Markov assumption [27], we implemented a Markov chain

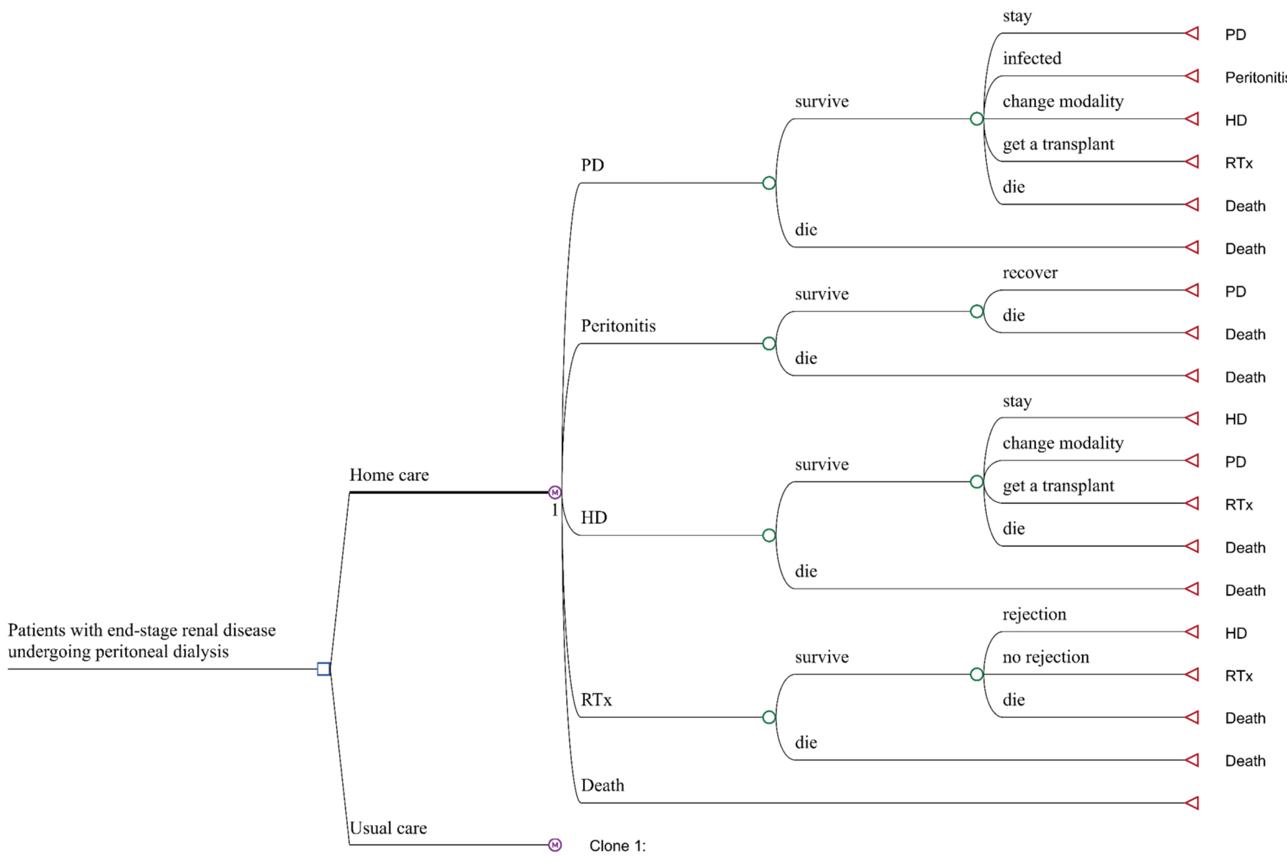

Figure 1. Structure of the Markov decision model.
PD, peritoneal dialysis; HD, hemodialysis; RTx, renal transplantation.

model, where transition probabilities were independent of prior transitions. In other words, the model does not retain information about the patients' previous health states.

Scenario design

Considering the inherent uncertainty involved in conducting economic evaluations, we made several assumptions regarding the parameters used in this study. To assess the effects of variations in these values, we conducted the cost-utility analysis in four scenarios before proceeding with the sensitivity analysis. Starting from the base scenario, we identified the most sensitive parameters in each category and developed Scenario 1 (base case), Scenario 2 (changes in transition probability), Scenario 3 (changes in cost), and Scenario 4 (changes in utility).

Intervention and comparators

We established and compared two groups: a home care intervention group (home care) and a control (usual care) group. The home care group received additional non-pharmaceutical interventions, specifically monthly remote monitoring care services for those with PD, while the control group received standard care.

Analytics and outcomes

We conducted a cost-utility analysis by utilizing the effectiveness variable, represented as quality-adjusted life years (QALYs), ranging from 0 (representing death) to 1 (indicating perfect health). To measure the utility of the home care group, we conducted a survey. Other outcomes were derived from previous studies (as described in the 'Data and variables' section).

Perspective

While the Korean government recommends a healthcare system perspective [27,28], we opted for a limited societal perspective. This perspective encompasses direct medical costs, direct non-medical costs (such as transportation and nursing care), and indirect costs associated with time. Given the circumstances of patients undergoing dialysis, who invest considerable time and expenses in hospital visits and managing their diseases, we decided to include time costs as part of the estimated costs to account for productivity losses.

Cost-effectiveness threshold

Internationally, the cost-effectiveness threshold is often set at one to three times the gross domestic product (GDP) per capita [29]. In our study, we utilized one-time the GDP per capita for the year 2022 [30] as the willingness-to-pay (WTP) threshold, which amounted to US$32,255 per increasing 1 QALY. Furthermore, we established a threshold indicating a probability of cost-effectiveness exceeding 50% [31].

Discount rate

We applied a discount rate of 4.5% for both QALYs and costs, in accordance with the 2021 newly updated 2021 guidelines for economic evaluation of pharmaceuticals in Korea [28]. Furthermore, for the probabilistic sensitivity analysis (PSA), we employed sampled discount rates ranging from 0% to 4.5%, following the recommendations that suggested using discount rates of 0% and 3% in the same report.

Time horizon and cycle length

To examine the sustainability of the home care program, we conducted a lifetime cost-effectiveness analysis of the PD home care program. The model was processed until the entire cohort transitioned to the 'death' health state, with a 1-year cycle length.

Half-cycle correction

We applied half-cycle corrections to both QALYs and costs to minimize inaccuracies in the transition estimates at the start or end of each cycle [32]. Our reference for this approach was the updated CHEERS (Consolidated Health Economic Evaluation Reporting Standards) 2022 checklist (Supplementary Table 2, available online) [33].

Data and variables

Transition probabilities

We designated the health states as follows: state 1 (PD), state 2 (HD), state 3 (peritonitis), state 4 (RTx), and state 5 (death). After transitioning into the peritonitis state, patients were mandated to either revert to the PD state or transition to the death state in the following cycle, as remaining in the current state was not an option. Patients in the RTx state had the probabilities of staying in that state, transitioning to HD, or moving to the death state. The transition probabilities were obtained from previous studies [34–40].

Utility input

To assess the utility of PD (home care), we utilized data from a 2020 survey [39,41]. The utility of PD (usual care) was calculated under the assumption that home care would result in a 6.8% increase [42]. In contrast to the base case analysis in Scenario 1, Scenario 4 assumed that the utility of PD (usual care) is equivalent to that of PD (home care). This enabled us to explore the variations in cost-effectiveness outcomes when using the same utility values.

Cost input

We incorporated input cost data comprising direct medical, direct non-medical, and indirect costs. All costs were adjusted to 2020 values, considering the exchange rate of Korean won 1,180.01 per $1 and the applicable inflation rates for the period.

The direct medical costs for PD encompassed both reimbursement and non-reimbursement costs incurred annually per individual patient, irrespective of the reason for their hospital visits. We collected data on hospital costs to facilitate a comparison between the home care and usual care groups. We conducted a comparison of cost history in cases of peritonitis, revealing a 1.375-fold increase ($p = 0.02$) when compared to normal PD status. To enhance the accuracy of gathering HD and RTx cost data, we referenced a prior study [24] that utilized data from our hospital. We incorporated an annually changing consumer price index (health care sector) to account for inflation. In Scenario 1, we calculated the range of cost parameters using the mean and standard deviation (SD), whereas in Scenario 3, we assumed the range to be 80% to 120% of the mean value to comprehensively assess the impact of cost parameters.

Transportation costs were defined as the annual round-trip transportation expenses per patient for outpatient hospital visits or hospitalizations. We sourced these values from our hospital data and previous studies [13,39] or assumed them in cases where data were unavailable. The average transportation cost per hospital visit was derived from the national health and nutrition survey conducted in 2005 [43], with adjustments made to reflect 2020 monetary values based on the consumer price index of the transportation sector [44]. Additionally, nursing care costs were obtained from a national report [45].

Indirect costs are a crucial consideration from a societal perspective [31]. Given the challenge associated with quantifying productivity loss, we incorporated patients' time costs, leading to a "limited" societal perspective, to account for the time spent on annual hospital visits and the resulting productivity loss. We assumed that a 1-day outpatient visit was equivalent to a half-day of lost economic activity (a full day in Scenario 3). As the hypothetical cohort in this study had an average age of 50 years, we referenced average salary data and employment rates for individuals in their 50s to 60s [46,47].

Table 1 [22,24,34–40,48,49] provides a summary of the entire input data. For the model input parameters used in Scenarios 2 to 4, please refer to Supplementary Tables 3–6 (available online).

Statistical analyses

Base case analysis

Our primary outcome measures included the incremental

Table 1. Model inputs for Scenario 1

Parameter	Estimate (range)	Distribution	Reference source
Transition probabilities			
PD to HD	0.022 (0.018–0.027)	Beta	[39]
PD to peritonitis (home care)	0.189 (0.151–0.227)	Beta	[40]
PD to peritonitis (usual care)	0.239 (0.191–0.287)	Beta	[40]
PD to RTx	0.023 (0.018–0.027)	Beta	[34]
PD to death	0.065 (0.052–0.078)	Beta	[35]
HD to PD	0.009 (0.007–0.011)	Beta	[36]
HD to RTx	0.023 (0.018–0.027)	Beta	[34]
HD to death	0.051 (0.041–0.061)	Beta	[35]
Peritonitis to death	0.123 (0.098–0.147)	Beta	[37]
RTx to HD	0.025 (0.020–0.030)	Beta	[38]
RTx to death	0.007 (0.006–0.009)	Beta	[38]
Utilities			
PD (home care)	0.861 (0.689–1.000)	Beta	[39]
PD (usual care)	0.801 (0.641–0.961)	Beta	[48]
HD	0.830 (0.664–0.996)	Beta	[49]
Peritonitis (home care)	0.597 (0.477–0.716)	Beta	[22]
Peritonitis (usual care)	0.555 (0.444–0.666)	Beta	[22]
RTx	0.947 (0.757–1.000)	Beta	[49]
Death	0.000	Uniform	
Costs (US$)			
PD (home care)	24,031 (21,968–26,112)	Gamma	[39]
PD (usual care)	23,855 (22,107–25,624)	Gamma	[39]
HD	32,433 (29,683–35,196)	Gamma	[24,39]
Peritonitis	31,912 (23,839–40,015)	Gamma	[39]
RTx (1st year)	25,307 (23,177–27,534)	Gamma	[24,39]
RTx (after 1st year)	9,469 (8,501–10,455)	Gamma	[24,39]

HD, hemodialysis; PD, peritoneal dialysis; RTx, renal transplantation.

cost-effectiveness ratio (ICER), which was calculated by dividing incremental costs by incremental effectiveness (QALY). Results were considered cost-effective when ICER < WTP. An annual discount rate of 4.5% was applied for the base case analysis.

Sensitivity analysis

Incorporating assumptions into our input data required addressing the inherent uncertainty of the cost-effectiveness analysis. To assess the impact of these parameters, we conducted sensitivity analyses, including both deterministic sensitivity analysis and PSA [27].

We utilized one- and two-way sensitivity analyses to examine the impact of all parameters on cost-effectiveness. Initially, we conducted a one-way sensitivity analysis, calculating the 95% confidence interval for each parameter by considering the range defined by the mean and SD. In cases where variation values were unavailable, we used a range spanning 80% to 120% of the base case value. Following the one-way sensitivity analysis, we identified the two most sensitive variables and proceeded with a two-way sensitivity analysis.

PSA involves addressing the uncertainty of all variables simultaneously by randomly sampling parameter values from their specified distributions. It calculates the percentage of certain alternatives that are more likely to be optimal. We conducted a Monte Carlo simulation with 10,000 iterations, employing predefined distributions. Random sampling was applied to discount rates, ranging from 0% to 4.5%. The PSA results were visualized using an incremental cost-effectiveness (ICE) scatterplot and a cost-effectiveness acceptability curve (CEAC). The CEAC illustrates the probability of cost-effectiveness at the WTP threshold of $32,255 and also identifies the threshold at which the probability of the home care group being cost-effective exceeds 50%.

Value of information analysis: expected value of perfect information

Finally, we calculated the expected value of perfect information (EVPI), which is defined as “an estimate of the net health (or monetary) benefits that could potentially be gained per patient if the uncertainty surrounding their treatment choice could be resolved” [27]. This value represents the expected gains in outcome when perfect information is available without any uncertainty. The EVPI can be calculated by subtracting the expected net benefits with current information from the expected net benefits with perfect information.

Ethics statement

Our study’s procedures were reviewed and approved by the Institutional Review Board at Severance Hospital, Yonsei University (No. 4-2022-0552). As the study subjects were de-identified, the need for written consent from the patients is waived.

Results

Base case analysis

Table 2 summarizes the cost-effectiveness analysis results of the PD home care program. In the base case analyses, the results were within the WTP threshold range ($32,255), indicating that the home care intervention was a relatively more cost-effective strategy than the usual care.

Sensitivity analysis

Deterministic sensitivity analysis

Based on a one-way sensitivity analysis, the most sensitive parameter affecting the ICER outcome was the cost of PD home care and PD usual care (Fig. 2 for Scenario 1; Supplementary Figs. 1–3 for Scenarios 2–4, available online). However, these variations still remained below our WTP threshold ($32,255). The results of two-way sensitivity analyses by simultaneously changing the range of the two most sensitive parameters are shown in Supplementary Figs. 4–9 (available online). In all two-way sensitivity analyses, home care remained the optimal strategy compared to usual care, even when the two most sensitive parameters were varied.

Probabilistic sensitivity analysis

From the 10,000 iterations of the Monte Carlo simulation, the home care intervention emerged as the overall optimal strategy, with probabilities of 79.0% in Scenario 1 (Fig. 3), 74.5% in Scenario 2, 73.1% in Scenario 3, and 58.5% in Scenario 4 (Supplementary Figs. 10–12, available online). The CEAC graphs illustrate the probabilities of specific strategies being optimal as WTP varies (Supplementary Figs. 13–

Table 2. Results of the base case analysis

Variable	Cost (US$)		Effectiveness (QALY)		ICER, USD/QALY	C/E
	Cost	Incremental cost	Effectiveness	Incremental effectiveness		
Scenario 1						
Usual care	255,794	NA	8.79	NA	NA	29,110
Home care	258,906	3,112	9.42	0.64	4,895	27,476
Scenario 2						
Usual care	256,402	NA	8.86	NA	NA	28,952
Home care	258,552	2,151	9.38	0.53	4,085	27,557
Scenario 3						
Usual care	265,288	NA	8.79	NA	NA	30,190
Home care	268,987	3,699	9.42	0.64	5,819	28,546
Scenario 4						
Usual care	255,794	NA	9.18	NA	NA	27,864
Home care	258,906	3,112	9.42	0.24	12,812	27,476

C/E, cost/effectiveness; ICER, incremental cost-effectiveness ratio; NA, not applicable; QALY, quality-adjusted life years.
Scenario 1, base case; Scenario 2, changes in transition probability; Scenario 3, changes in cost; and Scenario 4, changes in utility.

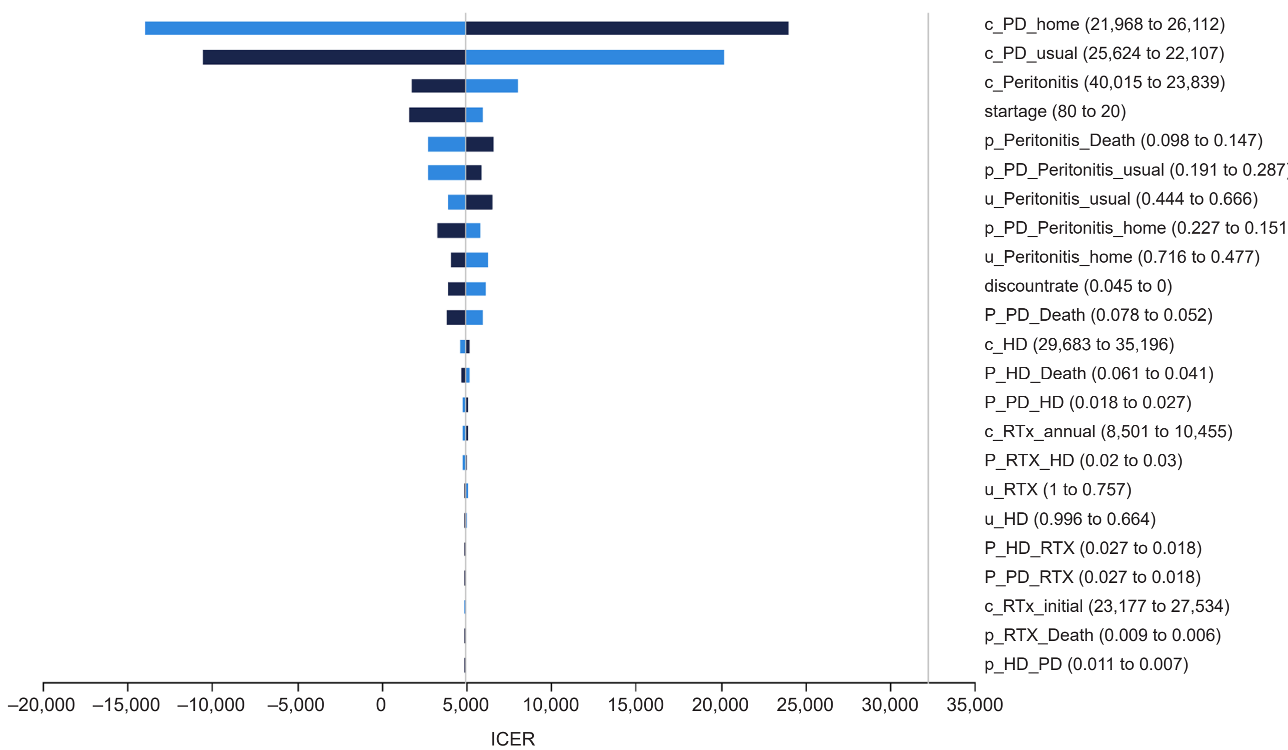

Figure 2. Tornado diagram for Scenario 1.
ICER, incremental cost-effectiveness ratio; PD, peritoneal dialysis; HD, hemodialysis; RTx, renal transplantation; c_HD, cost for HD; c_PD_home, cost for PD (home care); c_PD_usual, cost for PD (usual care); c_Peritonitis, cost for peritonitis; c_RTx_annual, annual cost for RTx; c_RTx_initial, initial cost for RTx; p_HD_death, probability from HD to death; p_HD_PD, probability from HD to PD; p_HD_RTx, probability from HD to RTx; p_PD_death, probability from PD to death; p_PD_HD, probability from PD to HD; p_PD_Peritonitis_home, probability from PD to peritonitis (home care); p_PD_Peritonitis_usual, probability from PD to peritonitis (usual care); p_PD_RTx, probability from PD to RTx; p_Peritonitis_death, probability from peritonitis to death; p_RTx_death, probability from RTx to death; p_RTx_HD, probability from RTx to HD; u_HD, utility for HD; u_Peritonitis_home, utility for peritonitis (home care); u_Peritonitis_usual, utility for peritonitis (usual care); u_RTx, utility for RTx.

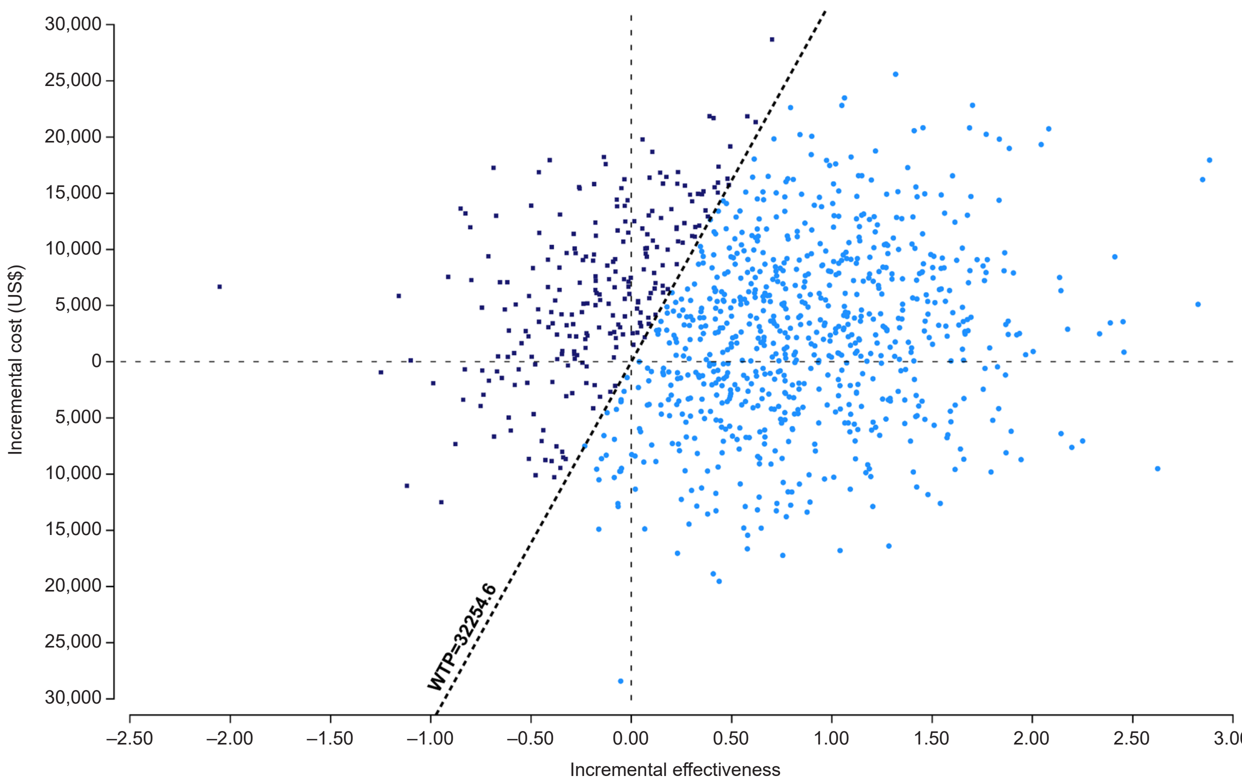

Figure 3. Incremental cost-effectiveness scatterplot for Scenario 1.
WTP, willingness-to-pay.

16, available online). With a WTP threshold of $32,255 per QALY, we determined the probabilities of the home care group being optimal in the ICE scatterplot results. We also assessed the WTP threshold at which the probabilities of the home care group being optimal exceeded 50%: $5,161 in Scenario 1, $4,193 in Scenario 2, $5,483 in Scenario 3, and $12,579 in Scenario 4 (Fig. 4).

Value of information analysis

Finally, we calculated the EVPI to determine the net benefit when perfect information was available without any uncertainty. To better illustrate the monetary impacts of the home care program, we opted to present the results in terms of net monetary benefit rather than net health benefit. For Scenarios 1–4, it was determined that additional gains of $2,963, $3,575, $4,846, and $6,577 per patient could be achieved, respectively, under conditions of perfect information with no parameter uncertainty (Supplementary Table 7, Supplementary Fig. 17; available online).

Discussion

Markov models are frequently employed in nephrology studies [19–23], yet they are seldom integrated with digital health components. In our research, we developed a Markov model to explore, for the first time, the lifetime cost-effectiveness of South Korea's recently launched home care program. Although our study was rooted in a Markov model for economic evaluation, we leveraged clinical outcomes obtained from long-term hospital data to combine the strengths of model- and trial-based economic evaluations. Our aim was to secure precise clinical and cost-effectiveness data. While collecting healthcare utilization data, such as the number of outpatient visits and hospitalizations, we relied on national-level Health Insurance Review and Assessment Service data [39], which is based on reimbursed medical services in Korea. Also, considering the inherent uncertainty in economic evaluations, we sought to assess outcomes beyond the base case analysis. We devised four scenarios by altering key parameters related to transition

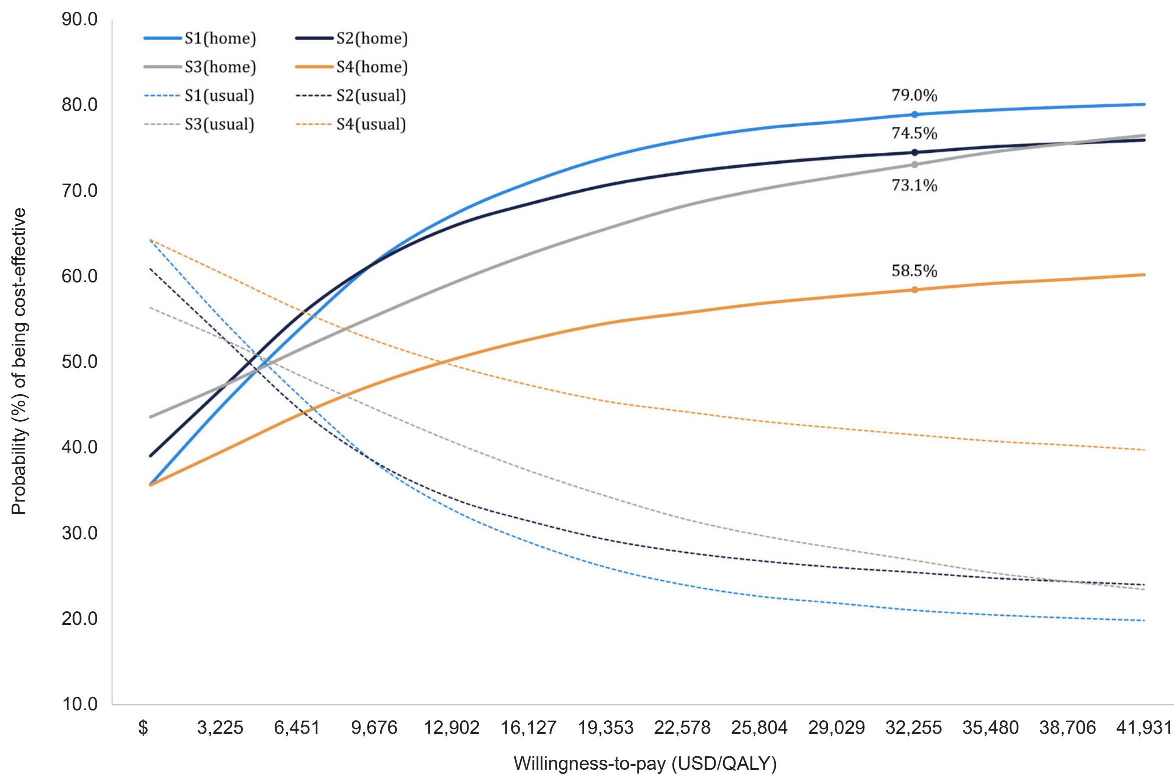

Figure 4. Cost-effectiveness acceptability curve for all scenarios.
Scenario 1, base case; Scenario 2, changes in transition probability; Scenario 3, changes in cost; and Scenario 4, changes in utility. QALY, quality-adjusted life years.

probabilities, utilities, and costs. These scenarios allowed us to understand how results changed when specific parameters were modified.

Numerous economic evaluation studies have explored renal replacement therapies [19–23] and digital health solutions [50]. We believed that conducting research on patients undergoing PD within a home care program delivered through digital healthcare would hold significant value. As evident from the input parameters, one of the primary advantages of providing remote patient care services to PD patients lies in the early detection of PD complications, such as peritonitis, which can be challenging to identify during regular hospital visits occurring every 1 to 2 months. This capability not only allows for the prevention of complications from worsening but also suggests improved long-term clinical outcomes, making the home care program a potentially cost-effective alternative to conventional care. Also, in preparation for the implementation of the home care program, it is essential to determine the expected medical costs and unveil the uncertainty surrounding this information to realize additional net benefits through the EVPI.

The implementation of the home care program has led to notable changes in healthcare utilization patterns [39]. The rise in outpatient visits, even amid the COVID-19 pandemic, is a foreseeable outcome resulting from the early detection of symptoms facilitated by the home care program. This shift may potentially lead to a decrease in overall healthcare expenditures, allowing medical staff to redirect their focus toward other medical services. PD patients are expected to exhibit high adherence to the services provided, as they have significant concerns about potential dysfunctions or complications when performing dialysis at home without medical staff. Regular remote interactions with medical professionals facilitate the early detection of PD-related complications, offer guidance for timely hospital visits, and aid in the prevention of severe health outcomes.

Considering the results of our cost-utility analysis, which yielded an ICER of $4,895 per 1 QALY, roughly 15.2% of the WTP threshold of $32,255 (equivalent to Korea's GDP per capita), it is evident that the home care program requires a modest budget to yield positive outcomes. Hospitals can enhance the efficient utilization of their limited human resources by effectively managing PD patients through remote means, potentially reducing their healthcare utilization by proactively preventing predictable events.

While it may be challenging to generalize the results of this cost-effectiveness analysis conducted within the Korean healthcare system, it is reasonable to anticipate similar positive outcomes in a global context. In Korea, where hospitals are widely accessible, PD patients can feasibly visit healthcare facilities regularly every 1 to 2 months. Depending on the accessibility to hospitals in different countries, regular remote monitoring can detect PD complications or other dysfunctions remotely, making it possible to guide patients to visit hospitals when necessary.

In this study, we have primarily focused on evaluating the cost-effectiveness of ESRD patients undergoing PD. Given the enhanced clinical effectiveness demonstrated by conducting the home care program in other diseases, such as patients with type 1 diabetes mellitus [51], our economic evaluation study can potentially expand its scope to include other diseases in future research.

This study has several limitations and should, thus, be interpreted with caution. With the nature of economic evaluations, a cost-utility analysis involves many assumptions and uncertainties associated with collecting parameters, which may not fully reflect real-world conditions.

First, concerning transition probability parameters, we relied on data from our hospital to estimate probabilities from PD to peritonitis states. The 1-year cumulative incidence of peritonitis was predicted rather than observed, based on a pre-post design analysis where the home care group corresponded to post-homecare and the usual care group to pre-homecare.

Second, the utility measure used EQ-5D data from a survey of PD patients participating in the home care program, excluding those in the usual care group. Thus, a direct comparison of utilities between the home care and usual care groups was not possible, necessitating reference to utility values of PD (usual care) from previous studies.

Third, the cost data were extracted from our hospital's records and observed to be 30.4% higher [39] compared to average Korean data, overestimating costs compared to average values in Korea. However, given that the home care program typically operates in tertiary and general hospitals, differences in medical costs may not be substantial.

Meanwhile, further studies are needed to calculate the productivity loss using the Work Productivity and Activity Impairment index or Health and Labour Questionnaire [31,52].

Despite these limitations, this study holds significant implications. It underscores, for the first time, the cost-effectiveness of the PD home care program in Korea. While our use of tertiary care hospital data may have led to higher estimated medical costs and lower peritonitis incidence, suggesting potential increased cost-effectiveness in real-world settings, most parameters were grounded in robust national-level or hospital-specific data. Sensitivity analyses further bolstered confidence in the program's cost-effectiveness across various scenarios.

In conclusion, this study represents the first evaluation of the cost-effectiveness of a home care program for patients with PD in Korea. Through a lifetime Markov model, we demonstrated that the program is cost-effective, with ICER results below the WTP threshold.

Conflicts of interest

All authors have no conflicts of interest to declare.

Data sharing statement

The data presented in this study are available from the corresponding author upon reasonable request.

Authors' contributions

Conceptualization: KYK, BSK, SGL
Data curation, Formal analysis: KYK, THK, JS, SYJ
Investigation, Methodology: KYK, THK, BSK, SGL
Supervision: SGL
Validation: KYK, HWK
Visualization: KYK
Writing–original draft: KYK, HWK
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