

Economic Evaluation of an eHealth Application

Fostering Palliative Care for Cancer Patients in Greece

Naoum P¹, Athanasakis K¹, Zavras D¹, Soulis S², Pavi E¹

¹Department of Public Health Policy, University of West Attica, Athens, Greece;
²Department of Business Administration, University of West Attica, Athens, Greece

Background & Objective

In the context of palliative care, eHealth interventions are usually used to bridge the gap between healthcare professionals and patients, mainly in terms of the time from symptom manifestation and its reporting, which consequently leads to its management. Palliative care has been documented as a cost saving and/or cost-effective intervention [1,2]; however, the cost-effectiveness of integrating digital technology has not been adequately established yet [3]. The aim of the present study was to conduct an economic evaluation of an ehealth application that fosters palliative care for cancer patients in the context of Greece.

Methods

The sample of the analysis consisted of patients with chronic lymphocytic leukaemia (CLL) or myelodysplastic syndrome (MDS), who participated, in 2 Greek hospitals, in the European randomised clinical trial MyPal-ADULT [4]. The intervention group had access to the MyPal digital app and a smart watch, while the control group received standard palliative care.

Patients' quality of life was measured with the EQ-5D-3L questionnaire at baseline and every 4 weeks for a total of 6 months, and converted to Quality Adjusted Life Years (QALYs). Costs included the use of healthcare resources related to palliative care, healthcare professionals' time (education-engagement) and the smart watch. The analysis was performed from a third-party payer perspective, with 2023 as the reference year. Cost data were sought from appropriate official sources [5-9]. The Incremental Cost-Utility Ratio (ICUR) was estimated and a non-parametric sensitivity analysis was performed.

Results

Overall, 48 patients - 21 in the intervention group and 27 in the control group - had usable data on quality of life and cost and, thus, were used in the analysis.

In the intervention arm, 90.5% had a diagnosis of CLL, as well as 51.9% of the control arm patients. Moreover, 71.4% of the intervention group patients and 70.4% of the control group patients were male. The mean age of the intervention arm was 63.05 years (SD=10.93), and of the control arm 65.93 years (SD=11.12).

Table 1. Sample baseline characteristics

		Intervention arm	Control arm	Overall sample
		N=21	N=27	N=48
Age (mean)		63.05	65.93	64.67
Gender	Male	71.4%	70.4%	70.8%
	Female	28.6%	29.6%	29.2%
Diagnosis	Chronic lymphocytic leukaemia (CLL)	90.5%	51.9%	68.8%
	Myelodysplastic syndrome (MDS)	9.5%	48.1%	31.3%
Disease status	Stable	90.5%	81.5%	85.4%
	Progressive	9.5%	18.5%	14.6%

At 6 months, the quality of life for the intervention arm was estimated at 0.403 QALYs (95%CI=0.368;0.437) and at 0.391 QALYs for the control group (95%CI=0.354;0.427) (Table 2).

Table 2. Results on patients' quality of life

	QALY (mean)	St.Dev.	95% CI	
			Lower	Upper
Intervention arm (n=21)	0.403	0.081	0.368	0.437
Control arm (n=27)	0.391	0.098	0.354	0.427

References

[1] Mathew C, Hsu AT, Prentice M, Lawlor P, Kyeremanteng K, Tanuseputro P, et al. Economic evaluations of palliative care models: A systematic review. Palliat Med. 2020 Jan 19;34(1):69–82. doi: 10.1177/0269216319875906

[2] Naoum P, Athanasakis K, Pavi E. Is palliative care cost-effective? A systematic review of the literature. Home Health Care Management & Practice. 2024;36(3):205-216. doi:10.1177/10848223231209316

[3] Naoum P, Pavi E, Athanasakis K. Economic Evaluation of Digital Health Interventions in Palliative Care: A Systematic Review of the Literature. Front Digit Health. 2021;3:730755. Published 2021 Nov 3. doi:10.3389/fdgh.2021.730755

[4] Scarfò L, Karamanidou C, Doubek M, et al. MyPal ADULT study protocol: a randomised clinical trial of the MyPal ePRO-based early palliative care system in adult patients with haematological malignancies. BMJ Open. 2021;11(11):e050256. Published 2021 Nov 2. doi:10.1136/bmjopen-2021-050256

[5] Government Gazette Issue 2150/B/27-9-2011

[6] Government Gazette Issue 1958/B/12-8-2013

[7] EOPYY. Attributable Medical Acts. Updated November 8, 2022. Available from: <https://eopyyfiles.blob.core.windows.net/eopyysite/ServiceCategories/866f40c1-4d12-4f52-9cdc-f7f8dbc1f70.pdf>

[8] <http://kenicd.e-healthnet.gr/>

[9] Hellenic Ministry of Health. Updated Medication Price List, May 15, 2023. Available from: <https://www.moh.gov.gr/articles/times-farmakwn/deltia-timwn/11488-epikairopoihsh-deltioy-timwn-farmakwn-anthrwpinhs-xrhshs-me-enswmatwsh-dioikhtikwn-metabolwn>

Mean per patient cost for the 6-month study follow-up period was estimated at 495.032 euros/patient (95%CI: 129.934, 861.130) for the intervention arm and at 815.398 euros/patient (95%CI: 385.781, 1,245.015) for the control arm (Table 3).

Table 3. Resource use costs

	Mean resource use costs (€)	St.Dev.	95% CI	
			Lower	Upper
Intervention arm (n=21)	495.032	855.971	129.934	861.130
Control arm (n=27)	815.398	1,138.978	385.781	1,245.015

Regarding HCP time costs, for the control arm of the study, the HCPs spent time to guide the patients to use the web app, in order to complete the required questionnaires, and for regular patient visits. Accordingly, for intervention arm patients, the most time consuming task for HCPs was reviewing patient data and patient visits (Table 4).

Table 4. HCP costs

HCP time cost categories	Intervention arm (€)	Control arm (€)
Training	19.52	-
Patient guidance to setup application (intervention arm) / use web portal (control arm)	21.13	9.58
Patient data review	322.08	-
Technical issues	361.13	-
Scheduled patient visits	61.92	45.34

Based on the above, total mean costs were estimated at 1,380.82 euros and 870.32 euros, respectively, for intervention and control arm patients (Table 5).

ICUR was calculated at 41,642.94 €/QALY, while the bootstrapping analysis showed that, in the majority of pairs, the eHealth intervention was both more effective and more costly than usual care (Figure 1).

Table 5. Cost-utility results

	Intervention arm	Control arm	Incremental difference
Mean QALYs per patient	0.403	0.391	0.01225904
Mean total costs per patient	1,380.82	870.32	510.5023891
ICUR (€/QALY)	41,642.94		

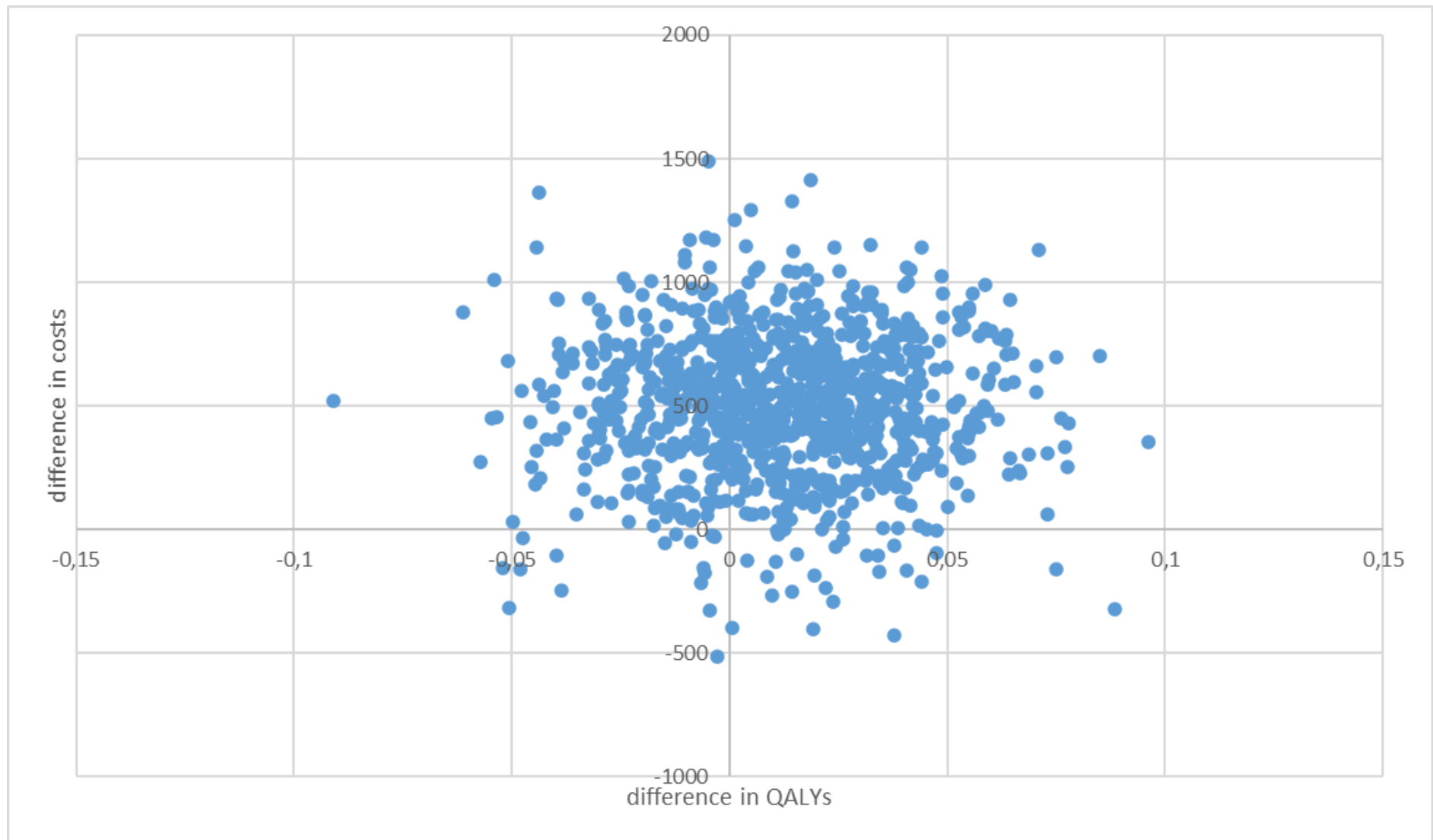


Figure 1. Cost-utility plane

Conclusions

The eHealth intervention is more costly and slightly more effective than usual care. In a scenario of adoption by the healthcare system, some cost categories are expected to be reduced, i.e. HCP time will be significantly reduced due to familiarity over time, while technical issues will be standardised; thus, improving the cost-effectiveness of the intervention.