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Telemedicine versus In-Person Follow-up for Cancer Pain Management:
Equity and Cost-Effectiveness Analyses using a Prospective Quasi-Experimental Design

Suratsawadee Wangnamthip[1], Pramote Euasobhon[1], Wanruthai Phaichaman[1], Pochamana Phisalprapa[2], Chayanis Kositamongkol[2], Skaorat Panchoowong[1], Mark P. Jensen[3]

[1] Department of Anesthesiology, Faculty of Medicine, Siriraj Hospital, Mahidol University, Bangkok, Thailand
[2] Division of Ambulatory Medicine, Department of Medicine, Faculty of Medicine Siriraj Hospital, Mahidol University, Bangkok, Thailand
[3] Department of Rehabilitation Medicine, University of Washington, Seattle, WA, USA

Mahidol University
Faculty of Medicine Siriraj Hospital
SIRIRAJ ANESTHESIOLOGY
Siriraj Pain Clinic



Background

Frequent in-person visits for cancer pain management impose substantial physical and financial burden on patients with advanced disease. Evidence regarding telemedicine's therapeutic equivalence and economic value compared with standard care remains limited.

Objectives

To evaluate the therapeutic equivalence and cost-effectiveness of telemedicine-based follow-up versus in-person care for cancer pain management.

Design & Analysis

Prospective quasi-experimental study with IRB approval (COA No. Si 310/2022) and ClinicalTrials.gov registration (NCT05628246).

Primary outcome
- Pain interference (Brief Pain Inventory)
- Therapeutic equivalence assessed using the Two One-Sided Tests procedure (margin ± 9.5)

Secondary outcomes
- Pain intensity, physical performance, opioid consumption,
- Analysis using linear mixed-effects models and generalized estimating equations

Cost-effectiveness
- Incremental cost-effectiveness ratios with bootstrapping (1,000 iterations) and probabilistic sensitivity analysis (10,000 iterations)

Setting / Participants

Adults with cancer-related pain
(n = 194)

- In-person care (n = 114)
- Telemedicine (n = 80)

Results

Primary outcome (Therapeutic equivalence)

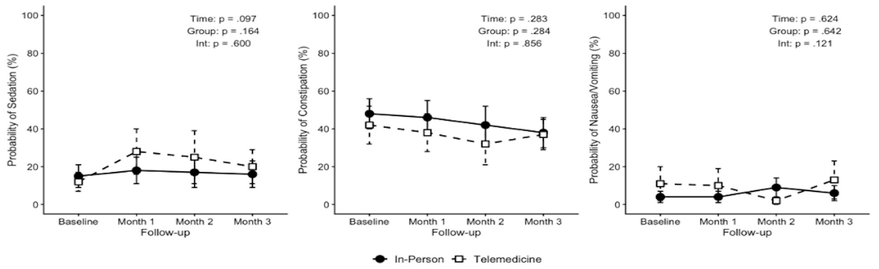
Pain interference at 1-month

mean difference = 0.42
(95% CI: −5.51 to 6.34; **p = .002**)

Established equivalence
(within ±9.5 margin)

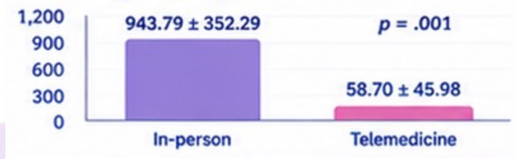
Secondary outcome (3-month follow-up)

Both cohorts demonstrated comparable improvements



Direct productivity cost
(3 months)

Total productivity loss
(Thai baht; **p = .001**)

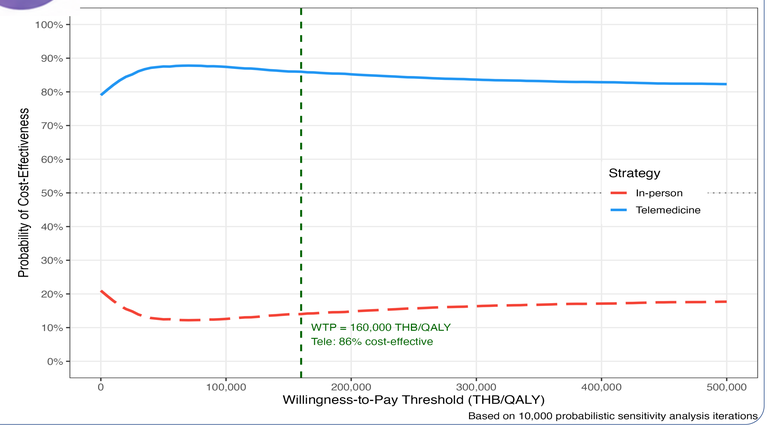


Cost-effectiveness



Probability of cost-effectiveness at the Thai willingness-to-pay threshold of 160,000 Thai baht per QALY.

cost-effectiveness acceptability curve



Conclusions

Telemedicine-based cancer pain management appears to be a safe, cost-saving, and therapeutically equivalent alternative to in-person care, with potential to enhance health equity and expand access for vulnerable oncology populations.

References
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