

Smart phone application for early detection of adverse clinical outcomes in solid malignancy

Panot Sainamthip¹, Kittipoom Supamontri², Palita Sakulma², Anastasiia Spirina²
 1 Faculty of medicine, Chulalongkorn University; 2 Invitrace Company Limited

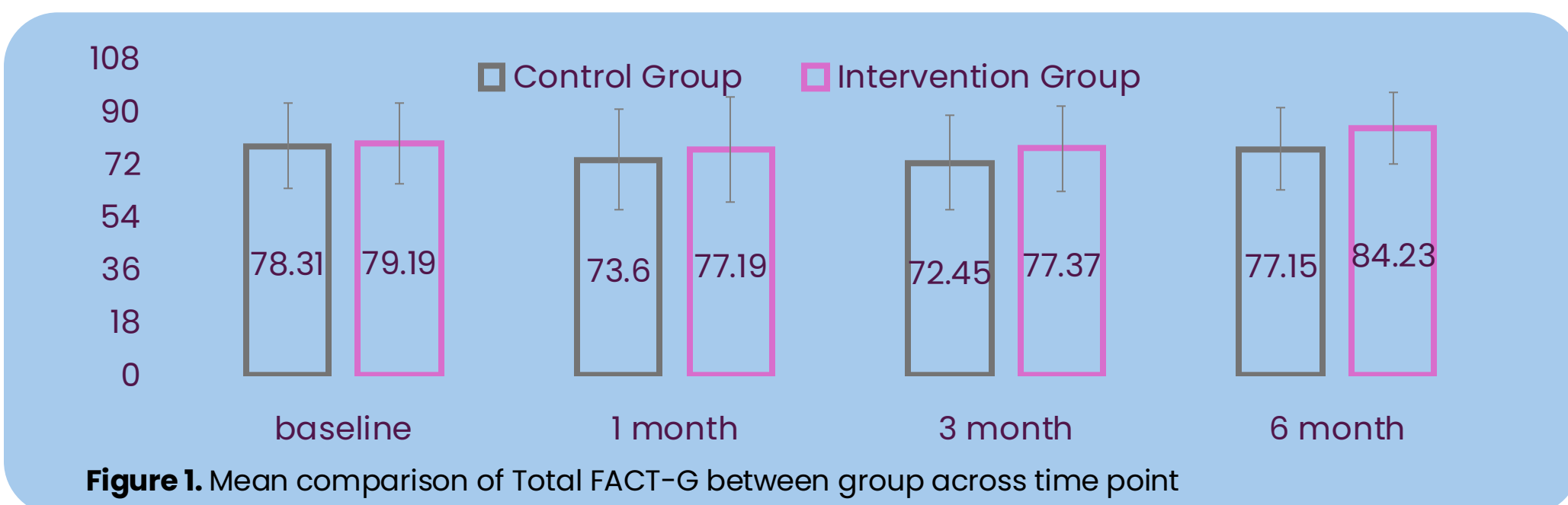
Background The adoption of mobile technology in healthcare is transforming care delivery, especially for Patient-Reported Outcomes (PRO). We developed a mobile app using AI and IoT to enable real-time communication between patients and providers, aiming to improve patient quality of life (QoL) and enhance management efficiency.

Methodology We conducted a pilot randomized controlled trial comparing quality of life using the FACT-G scale at baseline, 1, 3, and 6 months in cancer patients receiving standard care versus those using our WellHealth app with a smartwatch. The app, guided by MacMillan Cancer guidelines, provided A.I.-driven symptom assessment and self-care suggestions for adverse reactions. Secondary outcomes included cumulative emergency visits, cancer care knowledge, and feasibility.

Table 1. Baseline Characteristic (n=26)

		Total (n=26)	%	Intervention Group (n=13)	%	Control Group (n=13)	%	P
Gender	Male	6	23	2	15	4	31	.352
	Female	20	77	11	85	9	69	
Age	Mean	51.7 (33-63)		49		54		.045
	SD	8.024		8.799		6.721		
Cancer	Breast	16	61	8	62	8	62	.406
	Lung	2	8	2	15	0	0	
	Colon	6	23	3	23	3	23	
	Pancrease	1	4	0	0	1	7	
	Head and neck	1	4	0	0	1	7	

Result From December 1, 2022, to June 1, 2023, 30 patients were recruited. At 6 months, 13 participants remained in each group. Baseline characteristics were similar between groups as Table 1.



Between Groups

Average FACT-G scores were consistent between groups across all intervals (Figure 1). At 6 months, the intervention group's physical well-being score (24.38) was significantly higher than the control group's (20.46) (p = 0.048).

Within Group (Figure 2)

- Physical Well-Being Score**
 - Intervention: showed a significant increase from 1 to 6 month (↑)
 - Control: showed no significant change (↔)
- Emotional Well-Being Score**
 - Intervention: significant increase from month 1 to month 6 (↑)
 - Control: showed no significant change (↔)
- Functional well-being score**
 - Intervention: showed no significant change (↔)
 - Control: showed a significant decrease from 0 to month 3 (↓)
- Social well-being score**
 - Intervention: showed no significant change (↔)
 - Control: showed no significant change (↔)

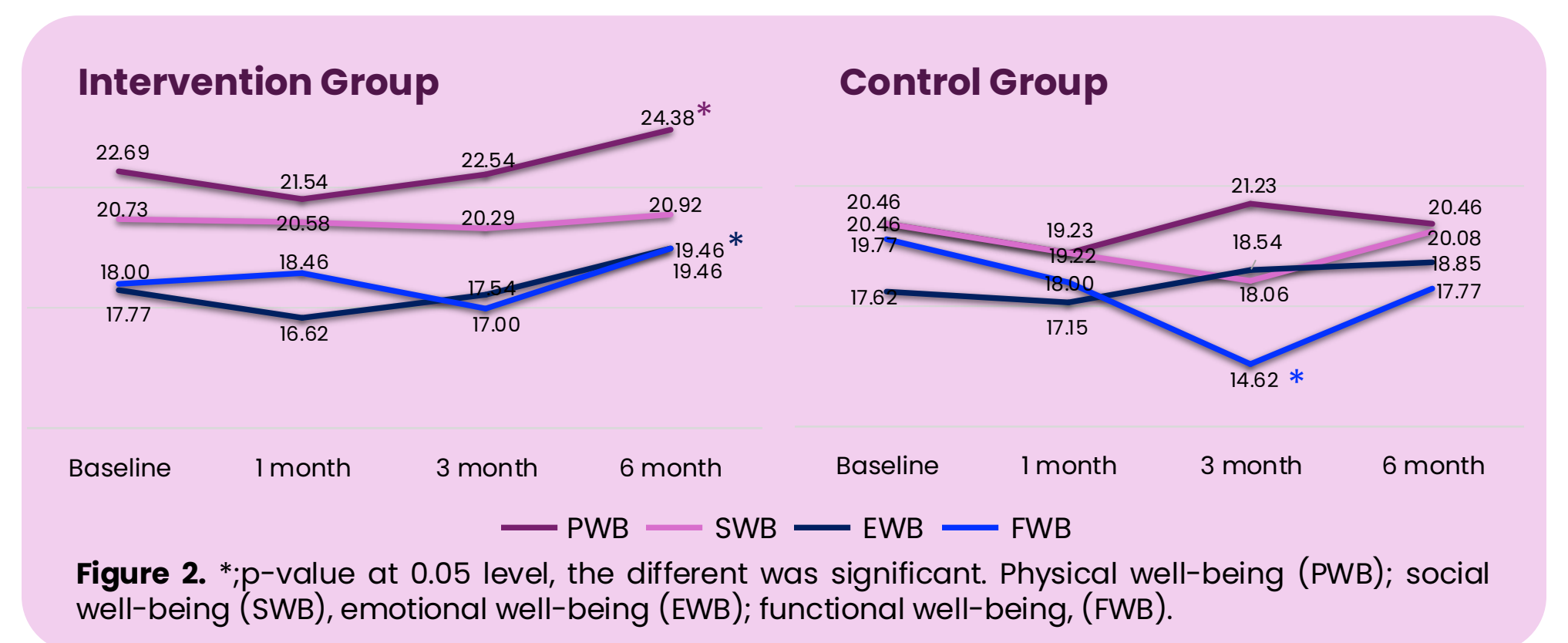
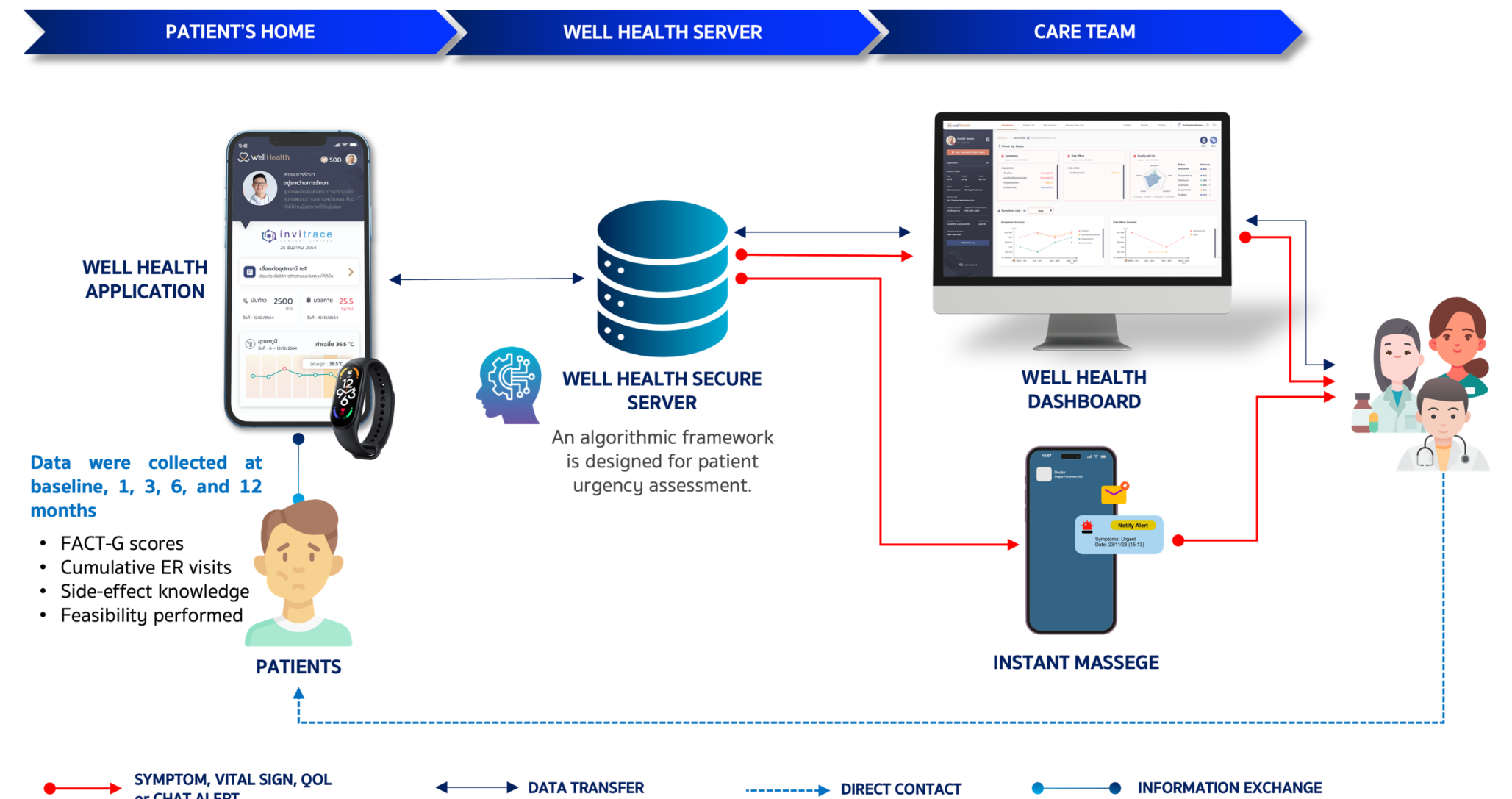
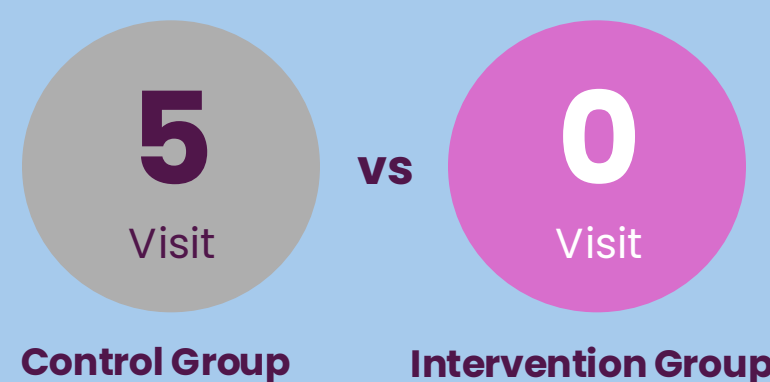


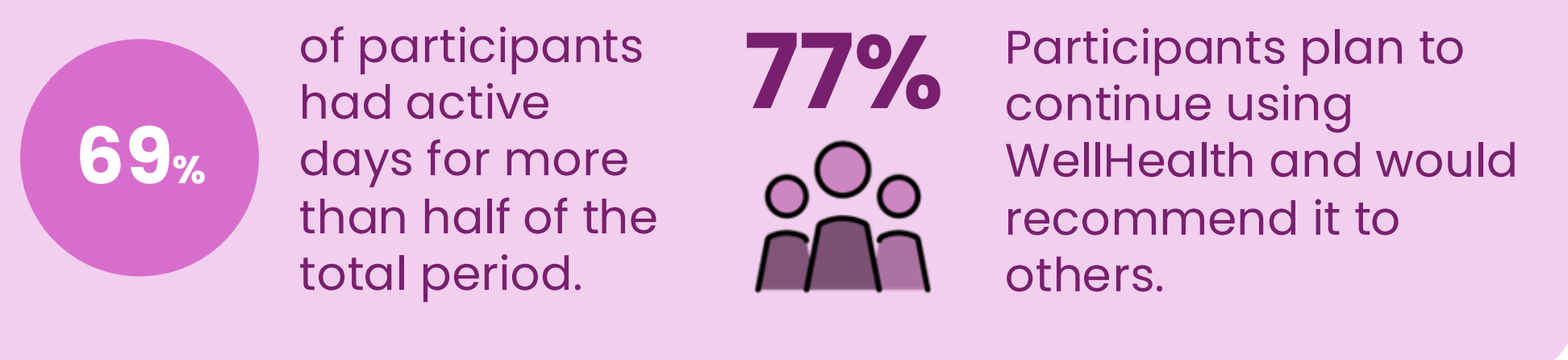
Figure 2. *;p-value at 0.05 level, the different was significant. Physical well-being (PWB); social well-being (SWB), emotional well-being (EWB); functional well-being, (FWB).

Figure 3. Comparison of cumulative emergency visit



The intervention group recorded zero ER visits during the study, whereas the control group had five incidents, mainly caused by adverse treatment-related events, as shown in Figure 3.

Technology Acceptance & Feasibility



Conclusions

The WellHealth mobile application significantly improved physical and emotional well-being in cancer patients and reduced emergency visits. With high acceptance and feasibility, WellHealth shows strong potential for enhancing patient management and outcomes in future care.

We aim to refine the model and select ideal patients for the next trial phase to further improve care quality.



Corresponding Author:

Panot Sainamthip, MD
 Chulalongkorn, Thailand
 Email: panot.s@chula.ac.th
 Tel: 781 227 1926



Clinical Trials Registry: TCTR20230331002

Funded by:
 Invitrace Company Limited, Thailand
www.invitracehealth.com