



Objective

Effective distress management is crucial for cancer patients' treatment outcomes. However, despite its recognized importance, real-world clinical practice faces substantial limitations in systematic distress assessment and stepwise interventions. In the post-COVID era, the global adoption of virtual cancer centers has increased to address these challenges. However, the efficacy of remote management as a complement to in-person cancer care remains debatable. Gangwon Province, characterized by vast geographical areas, low population density, poor transportation infrastructure, and limited healthcare resources, presents significant challenges in managing cancer survivors effectively. This study examines the case of "AICARE", an AI-driven distress management application developed by Kangwon National University Hospital's AI Cancer Healing Center, to explore strategies for improving distress management among cancer patients in the region.

Methods

From October 2024 to February 2025, cancer patients visiting the outpatient clinic of Kangwon National University Hospital were recruited to use "AICARE". Participants were asked to record their distress levels weekly using the Distress Thermometer (DT), Problem List, Patient Health Questionnaire-4 (PHQ-4), and Functional Assessment of Cancer Therapy – General (FACT-G) within the app. The app provided users with a graphical representation of their score trends, interpretation of results, personalized information, and contact details for support.

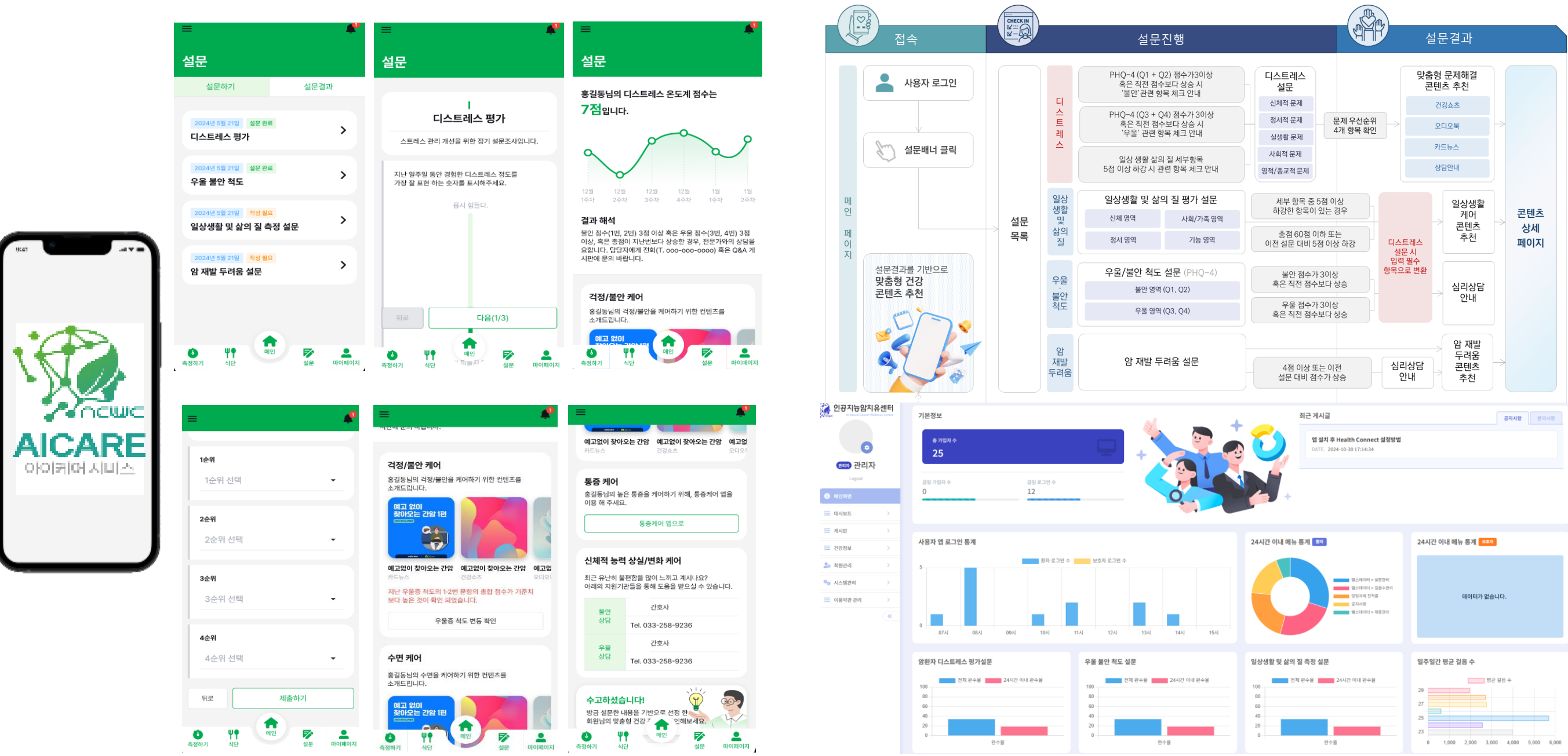


Table 1. Survey statistics for users whose distress score was 4 or higher at least once

	# of DT reports	# of DT increase	# of increased DT	# of PHQ reports	Axiety mean	Depression mean	# of anxiety ≥3	# of depression ≥3	# of increased PHQ	# of QOL reports	QOL 신체 mean	QOL 가족 mean	QOL 정서 mean	QOL 기능 mean	QOL 총점 mean	# of QOL ≤60 이하	# of decreased 50 이상 QOL total	total arm (max)	rank
user01	2	1	1	3	3.0	2.0	2	2	1	3	14.3	16.7	14.3	19.7	65.0	1	1	9	8
user02	4	4	1	4	1.5	0.3	1	0	2	4	19.0	11.8	2.3	8.0	41.0	4	2	14	6
user03	5	3	2	5	3.0	1.6	1	1	3	5	15.6	15.0	5.6	17.8	54.0	5	2	17	4
user04	5	3	2	5	2.2	1.0	2	1	2	5	15.2	13.0	3.8	14.0	46.0	5	2	17	4
user05	8	4	2	7	2.4	3.0	2	2	2	7	12.0	10.3	10.6	17.9	50.7	7	4	23	2
user06	6	6	1	6	3.8	4.7	5	6	1	6	16.0	10.2	15.3	17.7	59.2	4	3	26	1
user07	5	5	1	5	6.0	4.4	5	5	1	5	14.8	6.4	17.0	18.2	56.4	4	1	22	3
user08	5	3	1	5	2.0	2.8	2	3	2	5	21.2	18.4	8.8	15.8	64.2	1	2	14	6

#; numbers; DT; Distress Thermometer; PHQ; Patient Health Questionnaire–9; QOL; Quality of Life;

Results

A total of 16 participants were recruited, with 14 (87.5%) completing the surveys. Among them, 8 participants (57.1%) reported a DT score of ≥4 at least once, and 3 (37.5%) consistently reported distress levels ≥4 in weekly assessments. Based on PHQ-4 scores, 50% (4/8) exhibited clinically significant anxiety, and 37.5% (3/8) met the criteria for clinical depression. Notably, one participant (12.5%) consistently reported clinical-level depression across all PHQ-4 assessments. Among the 8 participants with elevated distress levels, 4 (50%) showed significant declines in quality of life, particularly in emotional and functional well-being. However, these individuals were not always classified as high-risk by PHQ-4. The algorithm-generated recommendations for additional support ranged from 9 to 26 instances per user, yet none actively sought assistance themselves.

Conclusion

This study implemented and evaluated preliminary functions of the "AICARE" app, enabling cancer patients to regularly assess their distress levels and review their results. Participation was lower than expected, and only a few completed continuous evaluations. However, findings indicate that more than half of the cancer patients experienced clinical-level distress, and there was a notable discrepancy between self-reported distress and actual help-seeking behavior. Future enhancements of the app will include over 100 personalized psychological content modules, features to identify unmet needs, and an improved risk-stratification system for high-risk distress patients. These advancements aim to enhance both patient self-management and clinical decision-making, positioning the app as a complementary tool in cancer care.