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Impact of a Multidisciplinary Supportive Care Model Using Distress Screening at an Asian Ambulatory Cancer Center: A Cluster Randomized Controlled Trial

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ABSTRACT

PURPOSE The Accessible Cancer Care to Enable Support for Cancer Survivors (ACCESS) program adopts a multidisciplinary supportive care model with routine distress screening to triage newly diagnosed cancer survivors for additional support on the basis of distress levels. This study aimed to evaluate the clinical impact of ACCESS over 1 year.

METHODS We performed cluster random assignment at the oncologist level in a 1:1 ratio to receive ACCESS or usual care. Participants 21 years and older, newly diagnosed with breast or gynecologic cancer, and receiving care at National Cancer Centre Singapore were included. Outcomes assessed every 3 months for 1 year included quality of life (QoL) (primary), functioning, physical and psychological symptom burden, and activity levels. Data were analyzed using mixed-effects models.

RESULTS Participants from 16 clusters (control = 90, intervention = 83) were analyzed. The ACCESS program did not significantly improve QoL (primary outcome). However, compared with usual care recipients, ACCESS recipients reported higher physical functioning ($P = .017$), role functioning ($P = .001$), and activity levels ($P < .001$) at 9 months and lower psychological distress ($P = .025$) at 12 months. ACCESS recipients screened with high distress had poorer QoL, lower role and social functioning, and higher physical symptom distress at 3 months but had comparable scores with ACCESS recipients without high distress after 12 months.

CONCLUSION Compared with usual care, participation in the ACCESS program did not yield QoL improvement but showed earlier functioning recovery related to activities of daily living and reduced psychological distress. Routine distress screening is a promising mechanism to identify survivors with poorer health for more intensive supportive care.

ACCOMPANYING CONTENT

Data Supplement

Protocol

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BACKGROUND

Cancer survivors[1] are a heterogeneous population with diverse care needs[2-4] and varying demands for multidisciplinary supportive care services. Supportive care models[5] using routine distress screening are increasingly implemented globally to proactively identify highly distressed survivors to receive more resource-intensive follow-up care.[6-11] Through early identification, evaluation, and timely management of supportive care needs, the screening process also facilitates survivors' systematic access to supportive care services to address active care needs, mitigating the impact of clinical practice variability.[5,12,13] Tailoring care intensity to survivors' distress levels can promote survivor-centric care[14-16] and equitable health recovery in a heterogeneous survivor population.[17]

Despite postulated benefits, evidence on the clinical impact of supportive care models using distress screening is inconclusive because of poor screening adherence and suboptimal implementation.[18-20] In addition, there are uncertainties about the long-term impact of repeated

CONTEXT

Key Objective

The Accessible Cancer Care to Enable Support for Cancer Survivors program adopts routine distress screening to triage multiethnic and multilingual cancer survivors to additional care personalization by a multidisciplinary supportive care team. We evaluated whether this program improved clinical outcomes in newly diagnosed cancer survivors over 1 year.

Knowledge Generated

Compared with usual care, program recipients did not report better quality of life (QoL) after 1 year but experienced earlier functioning recovery related to activities of daily living and lower psychological distress. Initially, program recipients reporting high distress had poorer QoL, lower functioning, and higher physical symptom distress than those reporting low to moderate distress. Eventually, both groups achieved comparable health status after 1 year.

Relevance

Routine distress screening is a promising mechanism to identify outpatient survivors with poorer health for more intensive supportive care, potentially promoting equitable recovery in the heterogeneous survivor population.

screening and follow-up beyond initial treatment.[21] More research is necessary to evaluate the effectiveness of well-implemented supportive care models and to test the underlying mechanisms—determining whether the model can accurately identify survivors with poorer health status on the basis of distress levels and whether a care-tailoring approach can help them achieve comparable health outcomes with survivors without high distress.

This study aims to evaluate the clinical impact of the Accessible Cancer Care to Enable Support for Cancer Survivors (ACCESS) program in Singapore. The ACCESS program adopts an inclusive, multidisciplinary supportive care model with routine outpatient distress screening for a multiethnic and multilingual population. We have previously reported satisfactory implementation indicators, successfully screening >80% of the target population with a high adherence rate[22] and demonstrating high responsiveness to survivors with high distress. This study then examined the program's 1-year impact on health outcomes for newly diagnosed breast and gynecologic cancer survivors compared with usual care. Secondary objectives included assessing the overall program acceptability and testing the postulated mechanisms. We hypothesized that ACCESS program recipients would achieve better health outcomes than patients receiving usual care.

METHODS

Study Design and Setting

This was an open-label, parallel arm, cluster randomized controlled trial conducted at National Cancer Centre Singapore (NCCS), the largest comprehensive ambulatory cancer center serving 65% of adult patients with cancer in Singapore's public sector.[23] This trial was approved by the SingHealth Centralized Institutional Review Board (CIRB 2019/2090) and registered at ClincalTrials.gov (ClinicalTrials.gov identifier: NCT04014309).

Cluster Random Assignment

To minimize contamination bias from medical oncologists' involvement in the ACCESS program, cluster random assignment[24] was performed at the oncologist level.[25] Each cluster unit comprised a medical oncologist and all eligible breast and gynecologic survivors under the medical oncologist's care. Stratified by seniority (associate consultant, consultant, and senior consultant), 16 oncologists were randomly allocated to the intervention or usual care arm in a 1:1 ratio using simple random assignment. Random numbers were generated by a computer at a meeting with all oncologists. To prevent contamination between participants and oncologists from different study arms, participants were scheduled to see the same oncologist throughout the follow-up period. Only participants in the intervention arm received the screening tool and access to the supportive care team.

Participants

Survivors 21 years and older, newly diagnosed with breast or gynecologic cancer, and receiving care from NCCS medical oncologists were eligible. Survivors were excluded if they could not read and understand English/Mandarin or were already under active care by the palliative care team, overlapping with the intervention's multidisciplinary care component. Survivors were recruited from October 2019 to June 2021 at their NCCS outpatient visits. Potential participants were identified from clinic lists, informed of the study by oncologists, and approached to provide informed consent for study enrollment. The Principal Investigator, not involved in study accrual, monitored the recruitment rate biweekly to maintain balanced sample sizes between arms.

Recruitment in the control arm stopped earlier (April 2021 *v* June 2021).

Intervention

The ACCESS program is described in detail elsewhere.[22] Participants were routinely screened using the Distress Thermometer and Problem List (DTPL)[9] at each outpatient visit (Data Supplement, Fig S1, online only) and received structured informational webpages on coping and self-management. Participants reporting high distress, defined by a distress score ≥ 6 of 10, were reviewed by a nurse on the supportive care team. Benchmarked against the Hospital Anxiety and Depression Scale, the sensitivity and specificity of this cutoff score to distinguish clinically significant distress are 56% and 96%, respectively.[27] These highly distressed participants would receive individualized advice and referrals to supportive care services on the basis of standardized care pathways (Data Supplement, Fig S2). Participants with complex care needs were discussed at formal multidisciplinary care discussions.

Control Arm

Participants in the control arm received usual care where supportive care issues were primarily managed by oncologists. They did not receive additional informational support, distress screening, or care from the ACCESS supportive care team.

Data Collection and Study Outcomes

At baseline, all participants completed a sociodemographic questionnaire. Clinical information on cancer diagnosis, treatments, and medical history was retrieved from the electronic medical records. The European Organization for the Research and Treatment of Cancer Quality of Life Questionnaire Core 30 (EORTC QLQ-C30)[28] and Rotterdam Symptom Checklist (RSCL)[29] were administered every 3 months for 1 year.

Intervention fidelity was assessed by screening tool completion rates, calculated as the proportion of oncologist visits with completed DTPL response(s) for each participant. The proportion of participants reporting a high distress score of ≥ 6 at any point during the 1-year follow-up period was determined. The number of supportive care team consults and referrals made for participants reporting high distress were characterized and tabulated.

To assess the overall impact of the ACCESS program, the primary outcome was the difference in quality of life (QoL) scores 1 year after baseline between study arms, measured using the EORTC QLQ-C30 global health status scale. Both English and Mandarin versions of EORTC QLQ-C30 were validated in the Singapore cancer population with satisfactory psychometric properties.[30,31] Secondary outcomes were assessed longitudinally over 1 year, including physical, role, emotional, cognitive, and social functioning statuses measured using EORTC QLQ-C30 and physical and psychological symptom burden and activity levels measured using RSCL.[29] All scales were linearly transformed to a 100-point scale.[32] Higher scores indicate better QoL, better functioning, higher physical symptom distress, psychological distress, and activity levels.

After 1 year, participants in the intervention arm completed a satisfaction questionnaire adapted from the literature (Data Supplement, Table S1),[7,33] rating the ACCESS program on the basis of screening procedures and consultations with the supportive care team.

Sample Size Calculation

Without robust estimates for the anticipated effect size over an extended period from the literature, sample size was calculated to detect a reasonable, minimum possible difference of 8.3 points in the primary outcome.[34] A standard deviation (SD) value of 18 was identified from a longitudinal study of the Singapore breast cancer population.[35] The cluster autocorrelation value and intracluster correlation coefficient (ICC) were set at 0.5 and 0.005, respectively, both within the range reported in the literature.[36,37] For 16 clusters, 128 participants and 512 observations across four follow-up assessment timepoints would achieve $\geq 80\%$ power at $\alpha = 0.05$. Accounting for a 25% attrition rate, the target sample size was set at 170 participants (85 per arm).

Statistical Analysis

All statistical analyses were performed using STATA v.17 (StataCorp. 2021. Stata Statistical Software: Release 17. College Station, TX: StataCorp LLC) on the basis of a modified intention-to-treat principle. All statistical tests were two-sided with $\alpha = 0.05$. Descriptive statistics were used to summarize baseline characteristics, intervention fidelity, and satisfaction scores. Primary and secondary outcomes were analyzed using longitudinal linear mixed-effects models with maximum likelihood estimation. In all models, the study arm, time of measurement (categorical variable), baseline score, and two-way interaction of study arm $\times$ time were modeled as fixed effects, with random intercepts and slopes for clusters. Contrasts (intervention-control) were used to tabulate score differences attributable to the intervention at each timepoint, adjusting for multiple testing using Bonferroni correction. To test if the ACCESS program promoted equitable outcomes, post hoc exploratory subgroup analysis tabulated score differences in primary and secondary outcomes between program recipients with and without high distress (distress score <6 and ≥ 6).

The used maximum likelihood estimation method would provide unbiased estimations for data missing completely at random and missing at random.[38] We examined the pattern of data missingness and performed a sensitivity analysis to test the robustness of the results under a data missing not at

random (MNAR) assumption, where participants who failed to complete questionnaires during follow-up had poorer health. First, we conducted multiple imputations by chained equations using a linear model on the basis of baseline characteristics. To explore data MNAR, we offset the imputed QoL and functioning scale scores by a subtractive factor of −5 points, reflecting a minimum important difference in the EORTC QLQ-C30 scales.[34] For activity, physical, and psychological distress levels, we rescaled the scores by a multiplicative factor of 0.95. Three scenarios were explored: MNAR in both study arms, MNAR only in the control arm, and MNAR only in the intervention arm.

Ethics Approval and Consent to Participate

This study has been performed in accordance with the Declaration of Helsinki and was approved by the SingHealth Centralized Institutional Review Board (CIRB 2019/2090). Written informed consent was obtained from all study participants.

RESULTS

Baseline Participant Characteristics

Of the 1,352 screened survivors, 402 met the inclusion criteria and 181 were enrolled from 16 clusters (Fig 1). Eight participants (control = 1, intervention = 7) were lost to follow-up because of busy schedules (n = 3), treatment exhaustion (n = 1), deteriorating health condition (n = 1), and ceasing follow-up at NCCS (n = 1). We analyzed 90 and 83 participants from the control and intervention arms, respectively. Baseline demographic and clinical characteristics were comparable between both arms (Table 1).

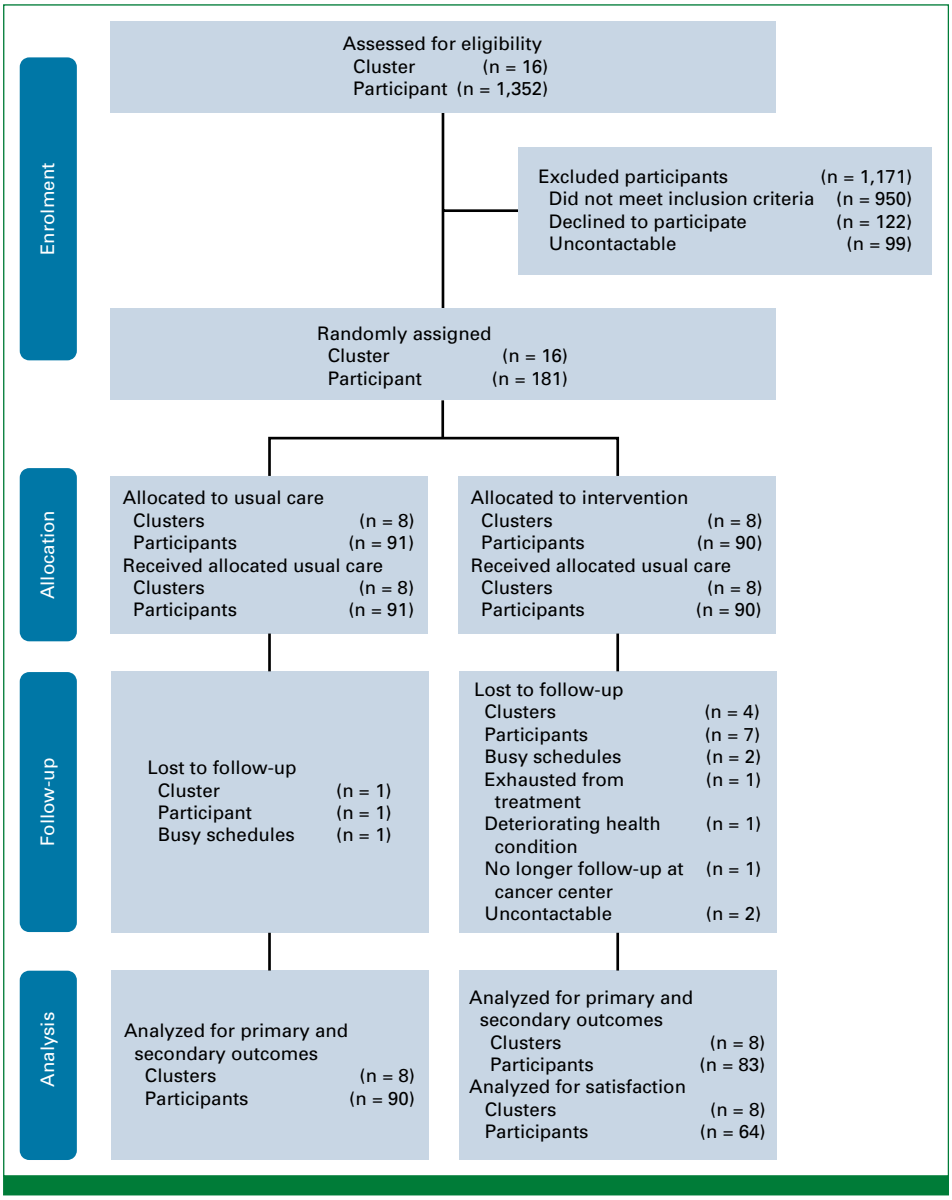

FIG 1. CONSORT diagram for cluster trial.

TABLE 1. Baseline Characteristics of Participants Included in the Longitudinal Analysis (N = 173)

Characteristic	Intervention Arm (n = 83)	Control Arm (n = 90)
Age, years, mean ± SD	55.5 ± 10.1	56.3 ± 11
Race, No. (%)		
Chinese	67 (80.7)	71 (78.9)
Malay	8 (9.6)	8 (8.9)
Indian	6 (7.2)	10 (11.1)
Others	2 (2.4)	1 (1.1)
Marital status,[a] No. (%)		
Single	13 (15.9)	21 (23.3)
Married	58 (70.7)	51 (56.7)
Divorced	7 (8.5)	11 (12.2)
Widowed	4 (4.9)	7 (7.8)
Education level,[b] No. (%)		
Secondary and below	54 (65.9)	45 (51.1)
Preuniversity	14 (17.1)	22 (25)
Graduate	14 (17.1)	21 (23.9)
Private insurance possession, No. (%)	43 (51.8)	43 (47.8)
Employed	48 (57.8)	44 (48.9)
Diagnosis		
Breast	78 (94)	82 (91.1)
Gynecologic	5 (6)	8 (8.9)
Cancer stage,[c] No. (%)		
Stage I-III	74 (89.2)	74 (86.1)
Metastatic	9 (10.8)	12 (14)
Treatment received, No. (%)		
Surgery	74 (89.2)	73 (81.1)
Radiotherapy	43 (51.8)	45 (50)
Chemotherapy	72 (86.8)	72 (80)
Endocrine therapy	55 (66.3)	53 (58.9)
Targeted therapy	27 (32.5)	35 (38.9)
Chronic conditions,[d] No. (%)		
None	50 (60.2)	47 (52.2)
≥ 1 condition	33 (39.8)	43 (47.8)

Abbreviation: SD, standard deviation.
[a]Data missing for one participant in the intervention arm.
[b]Data missing for two participants in the control arm and one participant in the intervention arm.
[c]Cancer was not staged for four control participants on the basis of electronic medical records.
[d]Included type 2 diabetes mellitus, hypertension, and hyperlipidemia.

The mean age of participants was 55.9 (SD = 10.5) years. The majority were Chinese (79.8%), were diagnosed with breast cancer (92.5%) of nonmetastatic stages (87.6%), and had received surgery (85%) and chemotherapy (83.2%). Approximately half were employed at baseline (53.2%) and were free from chronic illnesses such as diabetes mellitus, hypertension, and hyperlipidemia (56.1%).

Intervention Fidelity

In the intervention arm, the mean screening tool completion rate was 86.6% (SD = 22.9%) over 1 year, with 51 (61.5%) participants completing the screening tool at all visits to their oncologists. Among the 43 (51.8%) participants who reported high distress, 17 of 43 (39.5%) participants were identified from the first screen and 6 of 43 (14%) participants required additional input from the multidisciplinary team. All 43 participants reporting high distress were evaluated by supportive care nurses. The median (range) number of consultations with the nurse was 3 (1-19), with the majority conducted as teleconsultations (100 of 162, 61.7%). From these consultations, participants were referred to cancer rehabilitation (53.5%), psychosocial services (58.1%), community services (11.6%), general practitioners (9.3%),

TABLE 2. Referrals to Supportive Care Services Initiated by Supportive Care Nurses to Participants Reporting High Distress (n = 43)

Referrals to Supportive Care Services	No. (%)
Referrals to cancer rehabilitation	23 (53.5)
Under consideration	7 (30.4)
Accepted	10 (43.5)
Declined	6 (26.1)
Reasons[a] for referral to cancer rehabilitation	
Chemotherapy-induced peripheral neuropathy	13 (56.5)
Pain	7 (30.4)
Fatigue	3 (13)
Memory/concentration	4 (17.4)
Referrals to psychosocial services[b]	25 (58.1)
Under consideration	2 (8)
Accepted	15 (60)
Declined	8 (32)
Reasons[a] for referral to psychosocial services[b]	
Financial issues	8 (32)
Emotional issues	20 (80)
Referrals to other services	
Community services[c]	5 (11.6)
Pharmacist review	2 (4.7)
General practitioner	4 (9.3)

[a]A single referral may be made for multiple reasons.
[b]Includes medical social workers and psychologists.
[c]Includes support groups and activity groups.

and pharmacist review (4.7%). The uptake rates of initiated referrals were 43.5% and 60% for cancer rehabilitation and psychosocial services, respectively (Table 2).

Impact of the ACCESS Program

Table 3 shows adjusted mean score difference (intervention-control) in primary and secondary outcomes. Compared with usual care, the ACCESS program did not significantly improve the primary outcome (QoL). The baseline-adjusted global health status scale score did not differ significantly between study arms 12 months after baseline (mean score difference, −0.5 [95% CI, −4.5 to 3.6]; $P > .999$) and after adjusting for clustering effects (ICC < 0.001). Longitudinal analysis revealed similar QoL trajectories in both arms.

The study arm × time interaction term was significant, however, for physical functioning ($P = .015$), role functioning ($P < .001$), psychological distress ($P = .005$), and activity level ($P < .001$) but nonsignificant for other secondary outcomes. Compared with usual care recipients, ACCESS program recipients demonstrated greater improvement to report higher physical functioning (mean score difference, 6.1 [95% CI, 0.8 to 11.5]), role functioning (mean score difference, 13.2 [95% CI, 4.1 to 22.3]), and activity levels (mean score difference, 9 [95% CI, 5.3 to 12.6]) at 9 months after baseline. ACCESS program recipients also experienced significantly lower psychological distress at 12 months after baseline (mean score difference, −3.3 [95% CI, −6.2 to −0.3]).

Sensitivity Analysis

The Data Supplement (Fig S3) illustrates the extent of data missingness in primary and secondary outcomes at each assessment timepoint. Generally, score differences were accentuated and attenuated when MNAR only occurred in the control and intervention arms, respectively. Across all explored scenarios, no significant difference in QoL was observed except when MNAR only occurred in the control arm (Data Supplement, Table S2). In the more likely scenario that MNAR occurred in both arms, no significant difference was found for physical functioning. Consistent with the main analysis, compared with usual care recipients, ACCESS program recipients showed reported higher role functioning (mean score difference, 11.1 [95% CI, 3.6 to 18.6]) and activity levels (mean score difference, 6.6 [95% CI, 0.3 to 12.9]) at 9 months after baseline. ACCESS program recipients also experienced significantly lower psychological distress at 12 months after baseline (mean score difference, −3.7 [95% CI, −7.1 to −0.3]).

Subgroup Analysis

In the intervention arm, program recipients identified with high distress during screening had poorer QoL at 3- and 9-month timepoints than program recipients without high distress. After 12 months, both groups attained comparable QoL scores (mean score difference, −4 [95% CI, −11.2 to 3.3]) (Fig 2). Similarly, compared with program recipients without high distress, program recipients screened with high distress had significantly lower role functioning (mean score difference, −14.1 [95% CI, −23.3 to −4.9]), social functioning (mean score difference, −11 [95% CI, −17.5 to −4.5]), and higher physical symptom distress (mean score difference, 4.6 [95% CI, 3.2 to 6]) at 3 months after baseline. By the end of the follow-up period, both groups reported comparable functioning status and physical distress levels (Fig 2). No significant differences were observed for other secondary outcomes (Data Supplement, Table S3).

Satisfaction With the ACCESS Program

Among 64 participants who completed the satisfaction survey, the majority (92.2%) found the screening frequency at each oncology outpatient visit appropriate. On the usability of DTPL, most participants minimally agreed that it was easy to complete (85.9%) and understand (85.7%) and useful (59.4%). Overall, the median satisfaction score (0 = unsatisfied, 10 = very satisfied) was 8 of 10 (IQR, 7-9). In addition, participants rated the ACCESS program a median score of 8 (IQR, 7-8) on how well it addressed their care needs (0 = not addressed, 10 = very well addressed).

TABLE 3. Longitudinal Changes in Primary and Secondary Outcomes

Outcome[a]	Baseline-Adjusted Mean Score[b] (95% CI)				Interaction Effect *P* (Study Arm × Time of Measurement)	Between Group Difference (Intervention–Control)	
	Intervention Arm		Control Arm			Adjusted Mean Difference (95% CI)	*P*[c]
Primary outcome	No.		No.				
Global health status					.177		
3 months	71	65.9 (61.2 to 70.7)	78	63.9 (60.9 to 66.9)		2 (−5.2 to 9.2)	>.999
6 months	68	70.7 (67.9 to 73.5)	82	70.3 (66.4 to 74.2)		0.4 (−5.7 to 6.6)	>.999
9 months	64	75.3 (73 to 77.7)	70	72.9 (69.8 to 76)		2.4 (−2.5 to 7.3)	.872
12 months	68	73.9 (71 to 76.7)	70	74.3 (72.9 to 75.8)		−0.5 (−4.5 to 3.6)	>.999
Secondary outcomes	No.		No.				
Physical functioning					.015		
3 months	71	80.6 (79.2 to 81.9)	78	78.5 (75.1 to 81.9)		2.1 (−2.7 to 6.9)	>.999
6 months	68	78.8 (75.9 to 81.7)	82	76.8 (73.1 to 80.5)		2 (−4 to 8)	>.999
9 months	64	87.4 (85.3 to 89.5)	70	81.3 (77.3 to 85.3)		6.1 (0.8 to 11.5)	.017
12 months	68	85 (80.2 to 89.7)	70	82.6 (80.4 to 84.8)		2.4 (−4.4 to 9.1)	>.999
Role functioning					<.001		
3 months	71	71.8 (63.8 to 79.8)	78	74.8 (70.3 to 79.3)		−3 (−14.7 to 8.8)	>.999
6 months	68	74.5 (70.9 to 78.1)	82	72.7 (70.3 to 75.2)		1.8 (−3.7 to 7.4)	>.999
9 months	64	88.7 (86.5 to 90.9)	70	75.5 (68.6 to 82.4)		13.2 (4.1 to 22.3)	.001
12 months	68	83.5 (79 to 87.7)	70	79 (74.6 to 83.5)		4.3 (−3.4 to 12)	.639
Emotional functioning					.086		
3 months	71	82.8 (80.4 to 85.2)	78	83.8 (80.8 to 86.9)		−1 (−6 to 4)	>.999
6 months	68	86.4 (84 to 88.8)	82	88.6 (86.3 to 91)		−2.2 (−6.5 to 2.1)	.809
9 months	64	91.6 (88.6 to 94.7)	70	87.8 (84.1 to 91.5)		3.8 (−2.4 to 9.9)	.464
12 months	68	93.9 (92.9 to 94.9)	70	91.5 (88.8 to 94.2)		2.5 (−1.2 to 6.1)	.375
Cognitive functioning					.120		
3 months	71	89.9 (86.8 to 92.9)	78	84.7 (80.8 to 88.6)		5.2 (−1.2 to 11.5)	.164
6 months	68	88.1 (82.4 to 93.8)	82	87.7 (84.6 to 90.8)		0.4 (−7.9 to 8.6)	>.999
9 months	64	91.7 (89 to 94.4)	70	89.8 (86.1 to 93.6)		1.9 (−4 to 7.8)	>.999
12 months	68	90 (86.6 to 93.4)	70	90.5 (88.9 to 92.1)		−0.5 (−5.2 to 4.3)	>.999
Social functioning					.070		
3 months	71	76.2 (70.1 to 82.3)	78	78.9 (72.7 to 85.1)		−2.7 (−14.1 to 8.6)	>.999
6 months	68	83.8 (79.1 to 88.5)	82	81.9 (78.2 to 85.8)		1.9 (−5.8 to 9.6)	>.999
9 months	64	89.7 (87.7 to 91.6)	70	81.3 (74.7 to 87.9)		8.4 (0 to 16.8)	.049
12 months	68	87.9 (84.2 to 91.6)	70	84.8 (78.9 to 90.8)		3.1 (−5.5 to 11.7)	>.999
Physical symptom distress levels					.503		
3 months	71	15.3 (13.5 to 17)	78	16.7 (14.9 to 18.4)		−1.4 (−4.4 to 1.6)	.983

(continued on following page)

TABLE 3. Longitudinal Changes in Primary and Secondary Outcomes (continued)

Outcome[a]	Baseline-Adjusted Mean Score[b] (95% CI)				Interaction Effect *P* (Study Arm × Time of Measurement)	Between Group Difference (Intervention–Control)	
	Intervention Arm		Control Arm			Adjusted Mean Difference (95% CI)	*P*[c]
6 months	68	10.7 (8 to 13.4)	82	11.2 (9.2 to 13.2)		−0.6 (−4.8 to 3.7)	>.999
9 months	64	7.7 (6.6 to 8.8)	70	9.2 (7.2 to 11.2)		−1.5 (−4.5 to 1.5)	.849
12 months	68	7.7 (7 to 8.4)	70	8 (7 to 9.1)		−0.4 (−2 to 1.3)	>.999
Psychological distress levels					.005		
3 months	71	15.9 (13.9 to 18)	78	14.6 (11.6 to 17.5)		1.3 (−3.2 to 5.9)	>.999
6 months	68	12.3 (9.9 to 14.8)	82	10.1 (7.9 to 12.4)		2.2 (−2 to 6.5)	.735
9 months	64	7.5 (5.8 to 9.2)	70	12.3 (8.3 to 16.3)		−4.8 (−10.3 to 0.8)	.127
12 months	68	5.4 (4.3 to 6.5)	70	8.6 (6.6 to 10.6)		−3.3 (−6.2 to −0.3)	.025
Activity levels					<.001		
3 months	71	81.6 (78.8 to 84.3)	78	76.3 (72.1 to 80.6)		5.3 (−1.1 to 11.6)	.155
6 months	68	81.4 (76.9 to 86)	82	75.3 (71.6 to 78.9)		6.2 (−1.1 to 13.5)	.141
9 months	64	90.1 (88.1 to 92.1)	70	81.2 (79.1 to 83.2)		9 (5.3 to 12.6)	<.001
12 months	68	89.5 (85.7 to 93.3)	70	84.1 (81.4 to 86.9)		5.4 (−0.6 to 11.3)	.098

[a]A higher global health status scale score indicates better quality of life. A higher functioning scale score indicates better functioning. Higher physical symptom distress and psychological distress score indicate higher physical symptom and psychological distress levels, respectively. A higher activity score indicates a higher activity level.
[b]Mean scores and 95% CIs were estimated from a linear mixed-effects model for the outcome variable, with fixed effects for study arm, baseline score, time, and interaction of time with study arm and random intercepts and slopes for clusters.
[c]*P* value adjusted for Bonferroni correction, $P < .05$ denotes statistical significance.

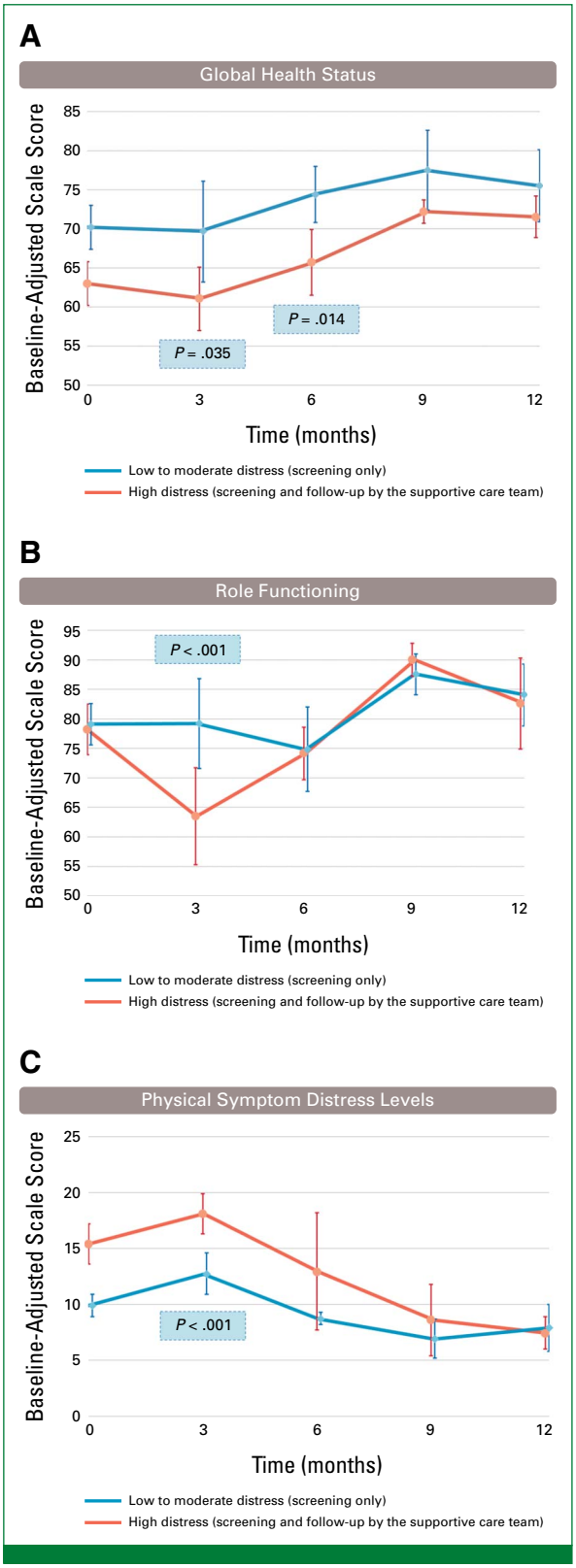

FIG 2. Baseline-adjusted mean (95% CI) scale scores estimated from a linear mixed-effects model for (A) global health status, (B) role functioning, and (C) physical symptom distress, stratified by subgroups in the intervention arm (high *v* low-moderate distress). *P* values presented correspond to statistically significant pairwise comparisons between subgroups at each timepoint, with Bonferroni correction.

In terms of behavioral intentions, 66.2% of participants were willing to continue program participation and 61.5% considered recommending it to others. The subgroup of participants with high distress (n = 27) rated the supportive care team member favorably for spending adequate time, listening carefully to them, showing respect, and providing sufficient and understandable information (Data Supplement, Fig S4). Two thirds of this group felt that their oncologists did not seem informed about the care provided by the supportive care team, and 18.8% provided feedback that the health care professionals caring for them were not working well together.

DISCUSSION

This study evaluated whether personalizing supportive care through routine distress screening would improve clinical outcomes in newly diagnosed cancer survivors beyond the initial treatment phase. Although the program did not yield improvement in overall QoL after 1 year, it showed potential value in facilitating earlier functioning recovery related to activities of daily living (ADL) and reducing psychological distress compared with usual care. Moreover, exploratory analyses revealed routine distress screening as a promising strategy to identify survivors with poorer health for more intensive supportive care.

Despite observing high program fidelity, the ACCESS program did not demonstrate better QoL than usual care after 1 year. This finding is similar to studies that evaluated programs using patient-reported outcome measures for routine screening.[39-42] As QoL is a multidimensional construct,[43] the lack of observed benefits may reflect inadequately addressed care dimensions. Foremost, providing structured informational webpages alone may not meet survivors' information needs[44] as some may prefer to seek information from clinicians. Health care providers should consider introducing these resources to survivors during routine clinical conversations to optimize information delivery. Furthermore, one fifth of program recipients followed up by the supportive care team did not perceive their health care providers to be working well together, highlighting care coordination as an area for improvement. Recognizing that comprehensive assessments are increasingly advocated to evaluate care models,[45] it is paramount to collectively examine a broader set of outcome measures beyond QoL to elucidate the program's impact.

The observed earlier improvements in practical and social domains among ACCESS recipients highlighted the program's value in addressing ADL-related issues, a prevalent impairment among cancer survivors.[46] The program's screening process likely enhanced the visibility of specific ADL concerns for active management, reinforcing the value of targeted problem screening to supplement distress monitoring. Tailored support provided by supportive care nurses using standardized care management pathways was

further associated with social functioning improvement.[41,47] Eventually, with earlier functioning recovery, the ACCESS program could better prepare survivors for a smooth and timely transition into the community after primary treatment.

Our tailored approach to supportive care reduced psychological distress but not emotional functioning. Compared with the EORTC QLQ-C30 emotional functioning scale, the RSCL psychological distress scale contained additional items—anxiety, nervousness, and despair about the future. The program likely improved these constructs, consistent with reported anxiety reduction among highly distressed survivors over the first year of diagnosis after additional follow-up care provided by nurses.[48] In addition, screening and managing physical symptoms that form symptom clusters with anxiety[49-51] might have accentuated the program's impact on psychological distress, a stark contrast with studies that solely focused on the psychological aspect during follow-up.[19,52-54]

Subgroup analyses among ACCESS program recipients revealed potential underlying mechanisms of impact. Routine screening accurately identified survivors with poorer health status for additional follow-up within the first 3 months of program enrollment. The supportive care team helped these survivors achieve comparable health outcomes as survivors without high distress after 1 year. These preliminary findings support allocating more resource-intensive care to survivors with higher distress. Early initiation of screening seems crucial to coincide with the peak of distress levels, which are typically associated with recent cancer diagnoses and treatments.[55] In addition, most survivors (72.2%) only reported high distress at repeated screens, reinforcing the value of repeated screening in the timely identification of highly distressed survivors.[56] Early provision of tailored supportive care to survivors with high distress is a promising approach to promote equitable outcomes in a heterogeneous survivor population.

A key strength of this study is its cluster design at the oncologist level to recognize oncologists as active care providers in the intervention and adjust for interoncologist practice variability. This design allowed a parallel group trial to be conducted within the same cancer center with minimal contamination bias, an efficient design for a small country like Singapore, or when the implementation climate does not favor new program adoption at the health system level. This study also has several limitations. First, missing data were more prevalent at later timepoints, but its impact was explored in a sensitivity analysis assuming data MNAR. Second, as enrolled survivors were all literate in English or Mandarin, the observed outcomes may not reflect survivors with lower language literacy levels. Nevertheless, the adult population in Singapore reports a high literacy rate of 97%.[57] Finally, as participants in the control arm were not routinely screened for distress, we could not stratify participants in the control arm by their distress scores. Future research could consider propensity-matching methods to derive a control group likely to report high distress for this comparison.

In conclusion, this study evaluating a multidisciplinary supportive care model with routine distress screening did not demonstrate improvement in the primary outcome and overall QoL, but showed potential value in facilitating earlier ADL recovery and reducing psychological distress among breast and gynecologic cancer survivors. Our preliminary findings suggest that survivors with poor health status can be accurately identified from routine distress screening to trigger more resource-intensive supportive care and promote equitable recovery in the heterogeneous survivor population. To further refine the care model, strategies to enhance support for survivors reporting moderate distress should be explored, such as health coaching, patient navigation, and optimized information delivery.

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AUTHORS' DISCLOSURES OF POTENTIAL CONFLICTS OF INTEREST

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DATA SHARING STATEMENT

All data generated or analyzed during this study are included in this published article (and its Data Supplement information files).

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AUTHORS' DISCLOSURES OF POTENTIAL CONFLICTS OF INTEREST

Impact of a Multidisciplinary Supportive Care Model Using Distress Screening at an Asian Ambulatory Cancer Center: A Cluster Randomized Controlled Trial

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Open Payments is a public database containing information reported by companies about payments made to US-licensed physicians (Open Payments).

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Employment: National Cancer Center Singapore, Tan Tock Seng Hospital

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Leadership: SingHealth
Stock and Other Ownership Interests: CellWave
Honoraria: Gilead Sciences
Patents, Royalties, Other Intellectual Property: (1) Substituted Azole Derivatives for Generation, Proliferation, and Differentiation of Hematopoietic Stem and Progenitor Cells (WIPO Patent Application WO/2018/048346/A1, US20190359941, AU2017325511, CN109890805, EP3500562, IN201947009069, JP2019528066, KR102019039988, MYPI 2019000830, SG11201901199W) is a new method (involving a novel molecule) for growing blood stem cells in cell cultures outside the human body prior to transplant. (2) Patent on "Immunosuppressive Composition for Use in Treating Immunological disorders (WIPO Patent Application WO/2018/034620/A1, AU2017313646, CN109803681, EP3500300, SG10201606949Q, SG10201906327T, SG11201901427R)" involves the use of a two-factor combination of a cytokine and an antibody that has been shown to effectively treat and prevent several autoimmune diseases in mice as well as graft versus host disease
Travel, Accommodations, Expenses: Gilead Sciences

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Consulting or Advisory Role: Blueprint Medicines, Lilly, Hengrui Medicine

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