Recruitment Strategies:
Institutional Review Board-approved flyers posted in the outpatient Pediatric Hematology/Oncology waiting room, clinic rooms, and infusion center

Consent/ Assent

Onboarding:
Participants (caregivers and patients) received instructions of Study Procedures through onboarding teleconference calls (Health Insurance Portability and Accountability Act compliant Zoom teleconference platform)

Participants (caregivers and patients) downloaded apps from App Store and used freely throughout the 120-day study duration:
ONC Roadmap and Fitbit®

ONC Roadmap for Caregivers:
1. Positive Activities
   a. Positive Piggy Bank
   b. Gratitude Journal
   c. Savoring
   d. Pleasant Activity Scheduling
   e. Random Acts of Kindness
   f. Signature Strengths
   g. Love Letter
   h. Engaging with Beauty
2. Chat Forum
   a. Gratitude Room
   b. Acts of Kindness Room
   c. Observed Beauty Room
   d. Strengths Room
   e. Love Letter Room
3. Resources
4. Graphs (Mood, Steps, Sleep)

ONC Roadmap for Patients:
No positive activities, chat forum, or resources

1. Graphs (Mood, Steps, Sleep)
2. *Info about app only*

Participants (caregivers and patients) completed Assessments at Baseline, Day 30, and Day 120
through ONC Roadmap
Participants were instructed to wear the Fitbit® and interact with ONC Roadmap throughout the study
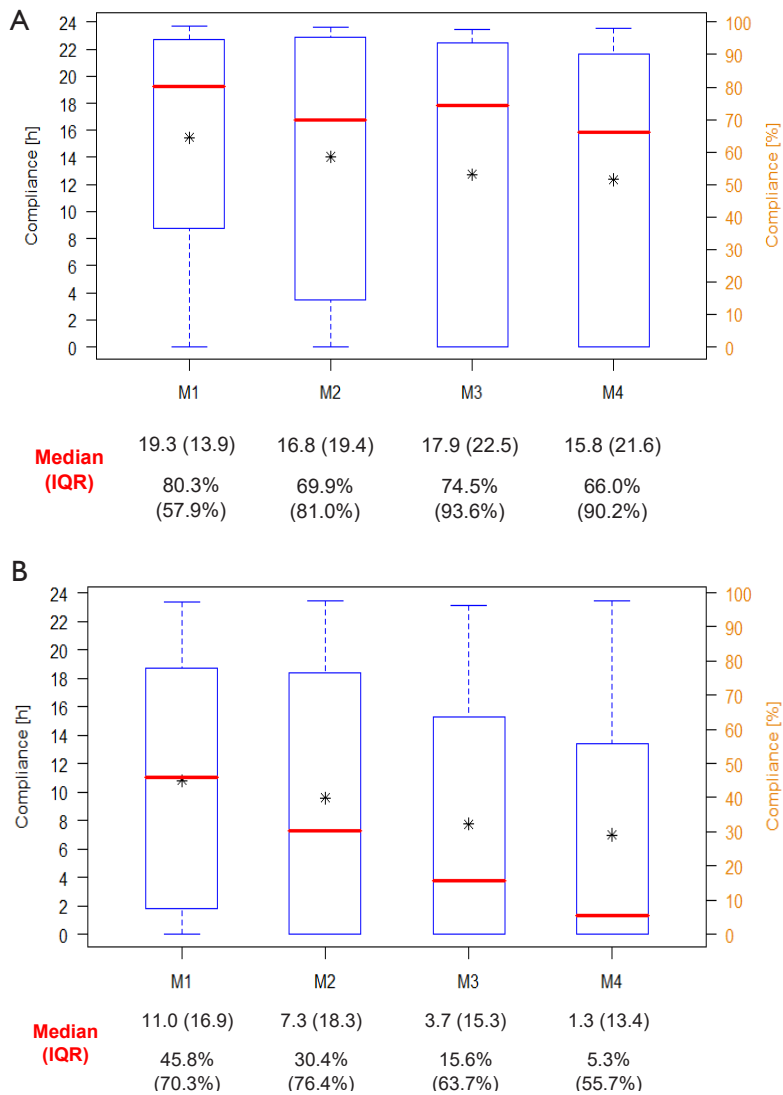
Figure S1 Study procedures.

Figure S2 Fitbit® Compliance Over Time in Study Participants: Each boxplot represents the daily compliance averaged chronologically for each 30-day of the 120-day study period (N=49; mean: *; median: —). (A) represents Fitbit® Compliance Over Time in Family Caregivers: M1 *vs*. M2, P<0.001; M1 *vs*. M3, P=0.004; M1 *vs*. M4, P=0.051. *Figure 3B* represents Fitbit® Compliance Over Time in Patients: Month 1 M1 *vs*. M2, P<0.001; M1 *vs*. M3, P=0.001; M1 *vs*. M4, P=0.008.

Table S1 Self-Reported Assessments by Family Caregivers and Care Recipients (Patients) at Baseline, Day 30, Day 120

Measure	Description	Scoring
Age 18+ Years: Family Caregivers & Patients		
PROMIS® Global Health (Mental and Physical) v1.2	10-item Short Form represents Global Physical Health (overall physical health, physical function, pain, and fatigue) and Global Mental Health (quality of life, mental health, satisfaction with social activities and emotional problems)	T score (mean = 50; SD=10); Two summary scores: Physical Health, Mental Health, higher scores indicate better health.
PROMIS® Physical Function v2.1	4-item Short Form assesses physical function (e.g., errands/ chores, up/downstairs, walk)	T score (mean = 50; SD=10); higher scores indicate better physical mobility.
PROMIS® Companionship v2.0	4-item Short Form assesses perceived availability of someone with whom to share enjoyable social activities.	T score with (mean = 50; SD=10); higher scores indicate better companionship to share activities.
Neuro-QoL (PROMIS® affiliate) Positive Affect and Well-Being v1.0	7-item Short Form assesses aspects of a person's life that relate to a sense of well-being, life satisfaction or an overall sense of purpose and meaning.	T score (mean = 50; SD=10); higher scores indicate better positive affect and well-being.
PROMIS® Self-Efficacy for Managing Symptoms v1.0	4-item Short Form assesses confidence to manage/control symptoms in different settings and to keep symptoms from interfering with work, sleep, relationships, or recreational activities.	T score with (mean = 50; SD=10); higher scores indicate better self-efficacy for managing symptoms.
PROMIS® Self-Efficacy for Managing Daily Activities v1.0	4-item Short Form assesses the confidence to perform various activities of daily living without assistance.	T score with (mean = 50; SD=10); higher scores indicate better self-efficacy for managing daily activities.
PROMIS® Ability to Participate in Social Roles and Activities v2.1	4-item Short Form assesses the ability to participate in social roles (friends, families, others) and activities (work, work at home).	T score with (mean = 50; SD=10); higher scores indicate better ability to participate in social roles and activities.
PROMIS® Emotional Support v2.0	4-item Short Form assesses the availability of others with whom to talk with and feel appreciated by others.	T score (mean = 50; SD=10); higher scores indicate better emotional support.
PROMIS® Sleep Disturbance v2.1	4-item Short Form assesses perceptions of sleep quality, sleep depth, and restoration associated with sleep.	T score (mean = 50; SD=10); higher scores indicate worse sleep disturbance.
PROMIS® Depression v2.1	4-item Short Form that assesses self-reported negative mood (sadness, guilt), views of self (self-criticism, worthlessness), and social cognition (loneliness, interpersonal alienation).	T score (mean = 50; SD=10); higher scores indicate worse depression.
PROMIS® Anxiety v2.1	4-item Short Form that assesses fear, anxious misery, hyperarousal, and somatic symptoms related to arousal	T score (mean = 50; SD=10); higher scores indicate worse anxiety.
PROMIS® Fatigue v2.1	4-item Short Form that assesses fatigue	T score (mean = 50; SD=10); higher scores indicate worse fatigue.
PROMIS® Pain Interference v2.1	4-item Short Form that assesses pain interference.	T score (mean = 50; SD=10); higher scores indicate worse pain interference.
Age 18+ Years: Family Caregivers Only		
TBI-CareQOL (PROMIS® affiliate) Caregiver Anxiety v1.0	TBI-CareQOL (PROMIS® affiliate) Caregiver Anxiety v1.0	T score (mean = 50; SD=10); higher scores indicate worse caregiver anxiety.
TBI-CareQOL (PROMIS® affiliate) Caregiver Strain v1.0	TBI-CareQOL (PROMIS® affiliate) Caregiver Strain v1.0	T score (mean = 50; SD=10); higher scores indicate worse caregiver strain.

Table S1 (continued)

Table S1 *(continued)*

Measure	Description	Scoring
Age 18+ Years: Family Caregiver Only (Parent Proxy)		
PROMIS® Parent Proxy Physical Function v2.0	4-item Short Form assesses parent's overall evaluation of patient's physical function (e.g., errands/chores, up/downstairs, walk).	T score (mean = 50; SD=10); higher scores indicate better physical mobility.
PROMIS® Parent Proxy Depression v2.0	4-item Short Form that assesses parent's overall evaluation of patient's negative mood (sadness, guilt), views of self (self-criticism, worthlessness), and social cognition (loneliness, interpersonal alienation).	T score (mean = 50; SD=10); higher scores indicate worse depression.
PROMIS® Parent Proxy Anxiety v2.0	4-item Short Form that assesses parent's overall evaluation of patient's fear, anxious misery, hyperarousal, and somatic symptoms related to arousal.	T score (mean = 50; SD=10); higher scores indicate worse anxiety.
PROMIS® Parent Proxy Fatigue v2.0	4-item Short Form that assesses parent's overall evaluation of patient's fatigue.	T score (mean = 50; SD=10); higher scores indicate worse fatigue.
PROMIS® Parent Proxy Pain Interference v2.0	4-item Short Form that assesses parent's overall evaluation of patient's pain interference.	T score (mean = 50; SD=10); higher scores indicate worse pain interference.
PROMIS® Parent Proxy Sleep Disturbance v1.0	4-item Short Form assesses parent's overall evaluation of patient's sleep quality, sleep depth, and restoration associated with sleep.	T score (mean = 50; SD=10); higher scores indicate worse sleep disturbance.
Age 8–17 Years: Patients Only		
PROMIS® Global Health 7 v1.0	The ''7'' scale includes the same global health score (overall evaluation of one's physical, mental, and social health, which is conceptually equivalent to its PROMIS adult counterpart).	T score (mean = 50; SD=10); One summary score: Higher scores indicate better overall health.
PROMIS® Physical Function v2.0	4-item Short Form assesses physical function (e.g., errands/chores, up/downstairs, walk)	T score (mean = 50; SD=10); higher scores indicate better physical mobility.
PROMIS® Depression v2.0	4-item Short Form that assesses self-reported negative mood (sadness, guilt), views of self (self-criticism, worthlessness), and social cognition (loneliness, interpersonal alienation).	T score (mean = 50; SD=10); higher scores indicate worse depression.
PROMIS® Anxiety v2.0	4-item Short Form that assesses fear, anxious misery, hyperarousal, and somatic symptoms related to arousal	T score (mean = 50; SD=10); higher scores indicate worse anxiety.
PROMIS® Peer Relationships v2.0	4-item Short Form that assesses peer relationships, including association with peer-reported friendships, likeability, and social reputation	T score (mean = 50; SD=10); higher scores indicate better peer relationships.
PROMIS® Pain Interference v2.0	4-item Short Form that assesses pain interference.	T score (mean = 50; SD=10); higher scores indicate worse pain interference.
PROMIS® Sleep Disturbance v1.0	4-item Short Form assesses perceptions of sleep quality, sleep depth, and restoration associated with sleep.	T score (mean = 50; SD=10); higher scores indicate worse sleep disturbance.

Table S2 Feasibility and acceptability of ONC Roadmap

Fitbit®							
	Totally disagree	Disagree	Sometimes agree/disagree	Agree	Totally agree	Agree + Totally Agree	Net Favorability *Totally agree + Agree – Totally disagree + Disagree*
Instructions for the Fitbit® were easy to understand.	5.3%	5.3%	10.5%	65.8%	13.2%	79.0%	68.4%
The Fitbit® was easy to set up.	5.3%	0.0%	15.8%	71.0%	7.9%	78.9%	73.6%
The Fitbit® was easy to use.	7.9%	0.0%	13.2%	73.7%	5.3%	79.0%	71.1%
The Fitbit® was comfortable to wear.	2.6%	7.9%	7.9%	73.7%	7.9%	81.6%	71.1%
The Fitbit® was easy to sync with my phone.	7.9%	5.3%	18.4%	57.9%	10.5%	68.4%	55.2%
I was confident using the Fitbit®	2.6%	10.5%	10.5%	65.8%	10.5%	76.3%	63.2%

ONC Roadmap							
	Totally disagree	Disagree	Sometimes agree/disagree	Agree	Totally agree	Agree + Totally Agree	Net Favorability
The instructions for the Roadmap app set up were easy to understand.	0.0%	2.6%	21.1%	63.2%	13.2%	76.4%	73.8%
The Roadmap app was easy to download and set up	2.6%	2.6%	10.5%	60.5%	23.7%	84.2%	79.0%
The Roadmap app was easy to use.	0.0%	5.3%	18.4%	57.9%	18.4%	76.3%	71.0%
I was confident using the Roadmap app.	2.6%	7.9%	26.3%	47.4%	15.8%	63.2%	52.7%
	Poor	Fair	Good	Very Good	Excellent	Very Good + Excellent	Net Favorability
What is your overall rating of the design of the screens on the app, including the colors and layout?	0.0%	7.9%	28.9%	44.7%	18.4%	63.1%	55.2%

Assessments							
	Totally disagree	Disagree	Sometimes agree/disagree	Agree	Totally agree	Agree + Totally Agree	Net Favorability
The survey questions were easy to understand.	0.0%	5.3%	21.1%	52.6%	21.1%	73.7%	68.4%
The survey questions were easy to answer.	0.0%	0.0%	21.1%	57.9%	21.1%	79.0%	79.0%

How likely would you be to engage in a similar study that lasted…							
	Extremely unlikely	Unlikely	Neutral	Likely	Extremely likely	Likely + Extremely likely	Net Favorability
6 Months?	2.6%	10.5%	21.1%	31.6%	34.2%	65.8%	52.7%
1 Year?	10.5%	15.8%	21.1%	26.3%	26.3%	52.6%	26.3%

Study Expectations							
	A lot worse	A little worse	About the same	A little better	A lot better	About the same + A little better + A lot better	Net Favorability
Compared to what you expected, how you would rate your experience in participating in this research study?	0.0%	5.3%	50.0%	34.2%	10.5%	44.7%	39.4%

Percentages calculated from N=38 respondents at end of study (day 120).

Table S3 Average daily steps, sleep, and mood data by user and age cohort

	Caregivers	Care Recipients (Patients)
Entire Cohort N=49 Dyads		
Steps	7069 (3179)	5261 (2846)
Sleep (hours)	6.8 (1.2)	7.2 (2.0)
Mood	7.2 (1.4)	7.5 (2.0)
5–11 Years (Patient Age) N=25 Dyads		
Steps	7328 (3572)	6107 (3148)[§]
Sleep (hours)	6.8 (1.4)	6.8 (2.3)
Mood	7.8 (1.1)[*]	8.5 (1.9)[¶]
12–17 Years (Patient Age) N=18 Dyads		
Steps	6036 (2390)	3411 (1503)
Sleep (hours)	6.9 (1.0)	7.5 (0.9)
Mood	6.5 (1.4)	6.4 (1.5)
18+ Years (Patient Age) N=6 Dyads		
Steps	8872 (2470)	5268 (1630)
Sleep (hours)	6.9 (0.8)	8.6 (1.3)
Mood	6.5 (1.3)	6.1 (1.3)

Data presented as mean (standard deviation). [*]Caregiver Mood (patient age 5–11 years *vs*. 12–17 years): P=0.003; Caregiver Mood (patient age 5–11 years *vs*. 18+ years): P=0.022; Caregiver Mood (patient age 12–17 years *vs*. 18+ years): P>0.05. [¶] Patient Mood (age 5–11 years *vs*. 12–17 years): P<0.001; Patient Mood (age 5–11 years *vs*. 18+ years): P<0.001; Patient Mood (age 12–17 years *vs*. 18+ years): P=0.533. [§] Patient Steps (age 5–11 years *vs*. 12–17 years): P=0.014; Patient Steps (age 5–11 years *vs*. 18+ years): P=0.942; Patient Steps (age 12–17 years *vs*. 18+ years): P=0.113.

Table S4 Assessments by Family Caregivers and Care Recipients (Patients) at Day 30 & Day 120 *vs.* Baseline

CAREGIVER 18+ Years	Baseline, Mean (SD)	Day 30, Mean (SD)	Day 120, Mean (SD)	Day 30 *vs.* Day 0 Change			Day 120 *vs.* Day 0 Change		
Complete Surveys	N=50	N=43	N=38	Mean (SD)	C.I.	P value	Mean (SD)	C.I.	P value
Global (Mental) Health	45.2 (7.5)	48.1 (9.1)	46.0 (7.8)	2.705 (5.992)	(1.168, 4.242)	0.005	0.047 (5.175)	(−1.284, 1.379)	0.955
Global (Physical) Health	47.2 (7.6)	48.3 (8.8)	46.1 (7.9)	1.037 (5.758)	(−0.440, 2.514)	0.244	−2.071 (5.723)	(−3.543, −0.599)	0.032
Caregiver Anxiety	50.8 (7)	48.8 (6.8)	47.7 (6.3)	−1.77 (5.179)	(−3.098, −0.440)	0.030	−1.987 (5.619)	(−3.432, −0.541)	0.036
Caregiver Strain	51.4 (8)	49.6 (6.1)	47.3 (6.2)	−1.953 (6.732)	(−3.680, −0.227)	0.064	−3.150 (5.769)	(−4.634, −1.666)	0.002
Positive Affect	53.3 (5.2)	53.2 (7.0)	51.9 (6.1)	−0.069 (4.219)	(−1.165, 1.027)	0.916	−1.889 (3.857)	(−2.893, −0.885)	0.005
Anxiety	58.3 (8.9)	55.8 (7.9)	54.8 (8.3)	−2.026 (6.68)	(−3.760, −0.292)	0.056	−3.061 (7.454)	(−5.001, −1.120)	0.016
Depression	53.4 (7.8)	51.7 (7.5)	51.7 (7.5)	−1.229 (5.422)	(−2.637, 0.179)	0.150	−1.242 (5.857)	(−2.767, 0.283)	0.199
Fatigue	53.7 (9)	54.4 (8.8)	53.1 (9.8)	0.200 (5.15)	(−1.137, 1.537)	0.803	−0.842 (7.31)	(−2.745, 1.061)	0.482
Pain Interference	47.6 (8.3)	47.3 (7.5)	47.3 (7.9)	−0.051 (4.574)	(−1.254, 1.152)	0.943	0.716 (7.735)	(−1.322, 2.754)	0.572
Physical Function	52.1 (6.8)	52.1 (6.6)	53.6 (6.0)	0.286 (6.127)	(−1.285, 1.858)	0.761	0.861 (6.755)	(−0.877, 2.598)	0.437
Ability to Participate	48.7 (8.5)	50.1 (8.6)	50.8 (9.0)	1.493 (6.833)	(−0.282, 3.267)	0.164	1.063 (9.43)	(−1.392, 3.518)	0.491
Sleep Disturbance	52 (5.6)	51.6 (5.4)	51.8 (6.0)	−0.267 (4.577)	(−1.455, 0.922)	0.708	−0.755 (6.272)	(−2.388, 0.878)	0.463
Companionship	50.5 (8.3)	49.1 (7.5)	51.8 (7.4)	−1.033 (6.572)	(−2.718, 0.653)	0.309	0.579 (8.625)	(−1.640, 2.798)	0.681
Managing Symptoms	49.2 (7.3)	50.2 (7.7)	50.0 (7.1)	0.140 (4.597)	(−1.053, 1.334)	0.844	−0.726 (7.339)	(−2.637, 1.184)	0.546
Managing Daily Activities	49 (6.5)	49.6 (6.9)	49.2 (7.0)	0.760 (5.103)	(−0.565, 2.085)	0.340	−0.042 (6.233)	(−1.665, 1.581)	0.967
Emotional Support	45.2 (7.6)	46.0 (10.4)	46.0 (9.4)	0.326 (7.637)	(−1.633, 2.284)	0.781	−1.132 (6.54)	(−2.814, 0.551)	0.293
PATIENTS 8-17 Years									
Complete Surveys	N=27	N=15	N=11	Mean (SD)	C.I.	P value	Mean (SD)	C.I.	P value
Global Health	40.2 (9.4)	41.6 (8.8)	40.4 (9.5)	−0.527 (6.027)	(−3.267, 2.214)	0.740	−1.187 (7.489)	(−4.592, 2.219)	0.549
Positive Affect	42.6 (8.5)	44.1 (7.1)	42.7 (12.1)	0.778 (6.418)	(−3.201, 4.756)	0.726	−1.000 (9.165)	(−6.600, 4.600)	0.738
Anxiety	56.4 (9.4)	50.7 (12.1)	54.5 (10.9)	−2.847 (12.329)	(−8.454, 2.760)	0.386	−4.027 (9.103)	(−8.287, 0.233)	0.173
Depression	57 (8.8)	51.6 (10.3)	51.6 (10.9)	−3.013 (3.284)	(−4.507, −1.520)	0.003	−4.318 (7.491)	(−7.824, −0.813)	0.085
Fatigue	55.3 (9.5)	53.8 (8.7)	54.7 (12.6)	1.593 (8.554)	(−2.297, 5.483)	0.483	−0.427 (7.099)	(−3.749, 2.895)	0.846
Pain Interference	49.9 (9.5)	50.1 (8.9)	48.4 (9.2)	−1.707 (11.292)	(−6.842, 3.429)	0.568	−3.273 (10.763)	(−8.309, 1.764)	0.337
Physical Function	41.1 (7.1)	40.1 (7.2)	41.5 (4.1)	0.333 (6.864)	(−2.788, 3.455)	0.854	−1.373 (8.469)	(−5.336, 2.591)	0.603
Peer Relationship	48.1 (8.5)	47.9 (11.0)	48.9 (10.6)	−0.587 (7.617)	(−4.051, 2.877)	0.770	1.518 (5.115)	(−0.875, 3.912)	0.348
Parent Proxy 8-17 Years	Baseline, Mean (SD)	Day 30, Mean (SD)	Day 120, Mean (SD)	Day 30 *vs.* Day 0 Change			Day 120 *vs.* Day 0 Change		
Complete Surveys	N=27	N= 22	N=19	Mean (SD)	C.I.	P value	Mean (SD)	C.I.	P value
Global Health	36.5 (9.7)	34.6 (6.9)	36.6 (9.1)	−2.091 (7.374)	(−4.796, 0.614)	0.198	−0.111 (6.733)	(−2.600, 2.379)	0.944
Anxiety	56.4 (9.1)	53.7 (12.7)	52.2 (12.3)	−2.405 (8.038)	(−5.353, 0.544)	0.175	−3.563 (8.437)	(−6.682, −0.444)	0.082
Depression	55.8 (9.1)	52.9 (10.8)	51.3 (11.4)	−1.673 (5.221)	(−3.588, 0.243)	0.148	−3.747 (6.669)	(−6.213, −1.282)	0.025

Table S4 *(continued)*

Table S4 (*continued*)

	Baseline, Mean (SD)	Day 30, Mean (SD)	Day 120, Mean (SD)	Day 30 vs. Day 0 Change			Day 120 vs. Day 0 Change		
				Mean (SD)	C.I.	P value	Mean (SD)	C.I.	P value
Fatigue	59.5 (10.3)	58.7 (11.2)	54.6 (11.3)	−0.277 (7.489)	(−3.025, 2.470)	0.864	−4.458 (8.233)	(−7.502, −1.414)	0.030
Pain Interference	51.9 (9.4)	52.5 (10.5)	49.4 (9.6)	2.273 (11.743)	(−2.036, 6.581)	0.374	−2.474 (8.384)	(−5.573, 0.626)	0.215
Physical Function	38.7 (8)	36.6 (6.1)	40.9 (8.9)	−2.336 (7.01)	(−4.908, 0.235)	0.133	1.084 (8.721)	(−2.140, 4.308)	0.595
Peer Relationships	44.9 (9.3)	44.0 (11.5)	46.2 (8.7)	−0.795 (9.731)	(−4.366, 2.775)	0.705	1.105 (9.159)	(−2.281, 4.491)	0.605
Sleep Disturbance	58.3 (8.6)	56.7 (8.0)	59.0 (8.4)	−0.927 (9.036)	(−4.242, 2.388)	0.635	−0.484 (8.23)	(−3.527, 2.558)	0.801
Parent Proxy 5-7 Years	Baseline, Mean (SD)	Day 30, Mean (SD)	Day 120, Mean (SD)	Day 30 vs. Day 0 Change			Day 120 vs. Day 0 Change		
Complete Surveys	N=14	N=13	N=12	Mean (SD)	C.I.	P value	Mean (SD)	C.I.	P value
Global Health	37.8 (8)	40.3 (6.2)	40 (8.2)	2.317 (5.679)	(−0.628, 5.261)	0.185	2.192 (5.408)	(−0.612, 4.995)	0.188
Anxiety	51.9 (10.1)	45.0 (8.6)	46.0 (8.9)	−7.092 (12.334)	(−13.49, −0.700)	0.072	−5.969 (14.765)	(−13.570, 1.627)	0.171
Depression	48.7 (6.6)	46.1 (7.4)	49.0 (5.7)	−2.642 (5.726)	(−5.610, 0.327)	0.138	0.308 (5.793)	(−2.673, 3.288)	0.851
Fatigue	52 (9.8)	55.1 (9.1)	50.0 (7.9)	1.758 (9.85)	(−3.348, 6.865)	0.549	−2.023 (6.995)	(−5.622, 1.576)	0.318
Pain Interference	50 (11.2)	48.1 (7.7)	45.0 (7.8)	−2.792 (8.827)	(−7.368, 1.784)	0.297	−5.015 (10.322)	(−10.33, 0.295)	0.105
Physical Function	45.1 (9.4)	41.9 (6.8)	47.1 (7.8)	−2.300 (6.032)	(−5.427, 0.827)	0.213	2.015 (5.406)	(−0.766, 4.797)	0.204
Peer Relationship	48.4 (8.4)	48.7 (10.7)	50.5 (7.9)	0.458 (7.349)	(−3.352, 4.268)	0.833	2.092 (6.449)	(−1.226, 5.410)	0.265
Sleep Disturbance	52.8 (7.3)	51.8 (8.6)	52.0 (6.9)	−0.708 (3.626)	(−2.588, 1.171)	0.513	−0.115 (6.499)	(−3.459, 3.228)	0.950
PATIENTS 18+ Years	Baseline, Mean (SD)	Day 30, Mean (SD)	Day 120, Mean (SD)	Day 30 vs. Day 0 Change			Day 120 vs. Day 0 Change		
Complete Surveys	N=7	N=5	N=4	Mean (SD)	C.I.	P value	Mean (SD)	C.I.	P value
Global (Mental) Health	39.2 (7.6)	41.8 (7.7)	40.8 (7.3)	2.560 (1.61)	(1.025, 4.095)	0.024	2.625 (4.241)	(−1.839, 7.089)	0.304
Global (Physical) Health	35 (10.4)	42.0 (8.7)	40.0 (9.6)	5.480 (6.465)	(−0.680, 11.643)	0.131	4.90 (10.43)	(−6.080, 15.877)	0.417
Positive Affect	48.8 (5.6)	51 (6.9)	49.9 (3.1)	1.320 (1.925)	(−0.516, 3.156)	0.200	1.525 (2.883)	(−1.509, 4.559)	0.368
Anxiety	65.2 (8.2)	61.0 (6.1)	61.9 (6.2)	−3.000 (5.083)	(−7.846, 1.846)	0.257	−3.80 (4.401)	(−8.432, 0.832)	0.183
Depression	57.1 (11.4)	54.0 (9.1)	54.9 (9.5)	−0.120 (2.308)	(−2.320, 2.080)	0.913	−0.60 (3.769)	(−4.567, 3.367)	0.771
Fatigue	59.3 (13.1)	54.3 (10.8)	52.1 (12.8)	−3.860 (6.114)	(−9.689, 1.969)	0.231	−7.90 (6.509)	(−14.75, −1.050)	0.094
Pain Interference	59.3 (8.3)	53.2 (8.4)	51.0 (11.6)	−5.920 (11.155)	(−16.56, 4.715)	0.301	−9.075 (19.33)	(−29.42, 11.269)	0.417
Physical Function	43.4 (13.7)	46.1 (7.8)	47.0 (7.4)	0.540 (11.699)	(−10.610, 11.69)	0.923	4.300 (11.551)	(−7.857, 16.457)	0.511
Ability to Participate	46.4 (9.7)	49.6 (10.0)	37.7 (9.0)	1.780 (3.866)	(−1.906, 5.466)	0.361	−9.775 (19.514)	(−30.31, 10.762)	0.390
Sleep Disturbance	56.8 (9.9)	53.4 (4.22)	49.5 (3.2)	−2.380 (9.217)	(−11.170, 6.407)	0.595	−6.200 (11.814)	(−18.634, 6.234)	0.371
Companionship	55.9 (6.4)	58.4 (6.9)	52.4 (7.3)	1.740 (5.602)	(−3.601, 7.081)	0.526	−2.625 (3.266)	(−6.063, 0.813)	0.206
Managing Symptoms	43.2 (4.7)	47.0 (6.3)	49.0 (9.1)	3.300 (5.456)	(−1.902, 8.502)	0.248	5.600 (4.833)	(0.514, 10.686)	0.103
Managing Daily Activities	44.1 (6.6)	48.3 (10.1)	44.8 (6.5)	3.020 (5.785)	(−2.495, 8.535)	0.308	0.300 (3.772)	(−3.670, 4.270)	0.884
Emotional Support	51.3 (12.4)	51.8 (10.5)	49.5 (3.1)	−2.000 (5.523)	(−7.265, 3.265)	0.463	−2.250 (2.872)	(−5.273, 0.773)	0.215

All PROMIS Assessments available at: Assessment Center [Internet]. [cited 2022 Jun 9]. Available from: https://www.assessmentcenter.net/.

Table S5 Spearman correlations between baseline Health-Related Quality of Life and Month 1 App Use

CAREGIVER 18+ Years	Month 1 App Use	P value
Baseline Health-Related Quality of Life domain	N=49	
Global (Mental) Health	0.211	0.145
Global (Physical) Health	0.248	0.089
Caregiver Anxiety	-0.331	0.02
Caregiver Strain	-0.233	0.107
Positive Affect	0.166	0.256
Anxiety	-0.021	0.886
Depression	-0.016	0.913
Fatigue	-0.031	0.830
Pain Interference	-0.199	0.175
Physical Function	0.181	0.212
Ability to Participate	0.148	0.310
Sleep Disturbance	0.018	0.901
Companionship	0.061	0.675
Managing Symptoms	0.232	0.109
Managing Daily Activities	0.142	0.332
Emotional Support	0.241	0.096

Table S6 Longitudinal Regression Model of Family Caregiver Global Mental Health and Care Recipient (Patient) Depression Over Time

	Estimate	C.I	P value
Caregiver (18+ Years) Global Mental Health			
Age (caregiver), per 1 year	−0.354	(−0.660, −0.048)	0.024
Caregiving Hours > 40 hrs (caregiver)	1.671	(−2.601, 5.943)	0.435
Gender (caregiver), male vs. female	−0.640	(−6.698, 5.419)	0.832
Any mental conditions (caregiver), any vs. non	−5.373	(−9.530, −1.217)	0.013
Day 30 vs. Day 0	2.766	(1.069, 4.463)	0.002
Day 120 vs. Day 0	0.306	(−1.468, 2.081)	0.732
Patient (8–17 Years) Depression			
Age (patient), per 1 year	0.842	(−0.364, 2.049)	0.162
Caregiving Hours > 40 h (carer)	−1.287	(−10.522, 7.948)	0.775
Gender (patient) Male vs. female	−4.041	(−11.615, 3.534)	0.281
Any mental conditions (caregiver), any vs. non	−4.557	(−11.985, 2.872)	0.217
Day 30 vs. Day 0	−3.687	(−6.969, −0.405)	0.029
Day 120 vs. Day 0	−4.512	(−8.228, −0.797)	0.019

Linear mixed model was used with time as repeated measurement; random intercept was fitted and grouped by each subject (caregiver or patient, respectively).

Table S7 Actor Partner Interdependence Model (APIM) of Family Caregiver (Carer) and Care Recipient (Patient) Interactions on Global Mental Health Assessments at Day 120

Dyad: "Caregiver Anxiety (X') + Patient Anxiety (X)" → "Caregiver Global Mental Health (Y') + Patient Global Health (Y)".

APIM parameters	Estimate	C. I.	P value
Actor effects			
X' → Y'	−0.872	(−1.375, −0.369)	0.002
X → Y	−0.769	(−1.313, −0.225)	0.008
carer age (per 1 year) → Y'	−0.567	(−1.089, −0.045)	0.037
carer any mental disorder → Y'	−3.881	(−9.086, 1.324)	0.142
patient gender (M vs. F) → Y	−2.591	(−12.007, 6.824)	0.581
Partner effects			
X' → Y	−0.270	(−1.044, 0.504)	0.485
X → Y'	0.165	(−0.156, 0.487)	0.306
caregiving > 40hrs → Y	−3.766	(−14.624, 7.092)	0.487

Dyad: "Caregiver Depression (X') + Patient Depression (X)" → "Caregiver Global Mental Health (Y') + Patient Global Health (Y)"

APIM parameters	Estimate	C.I.	P value
Actor effects			
X' -> Y'	−0.611	(−0.942, −0.28)	0.001
X -> Y	−0.776	(−1.12, −0.433)	0.0001
carer age (per 1 year) → Y'	−0.162	(−0.731, 0.408)	0.569
carer any mental disorder → Y'	0.548	(−5.35, 6.446)	0.852
patient gender (M vs. F) → Y	−1.390	(−8.099, 5.319)	0.677
Partner effects			
X' → Y	−0.553	(−0.972, −0.135)	0.013
X → Y'	−0.103	(−0.471, 0.266)	0.576
caregiving > 40hrs → Y	0.791	(−8.379, 9.962)	0.862

Linear model was fixed by generalized least squares method (function gls() in R). Symmetric covariance structure was assumed to apply only to observations within the same dyad. (corSymm[form=~1|Dyad.Number]); observations with different dyads were assumed to be uncorrelated; and within-group heteroscedasticity structure was assumed by allowing different variance in carers and care recipients.