ELETRONIC PATIENT-REPORTED OUTCOME MONITORING FOR PLANNING AND EVALUATING OUTPATIENT ONCOLOGICAL REHABILITATION (ONCO-REHA) IN AARGAU,SWITZERLAND

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Introduction

Following acute cancer treatment, cancer rehabilitation supports patients to recover physically, psychologically and regain their social life (1). To assess effectiveness of rehabilitative interventions, electronic patient reported outcomes (ePROs) can be used in addition to standardized clinical rehabilitation measures to assess the patient experience multiple times during rehabilitation (4). This may optimize effectiveness and long-term impact of interventions.

Methods

Patients were invited to participate in a 12-week multidisciplinary outpatient rehabilitation program (Onco-Reha) in Aargau, Switzerland, including physiotherapy (group and individual treatment), psycho-oncology support, nutritional counselling, social services, nurse-led coordinative interventions and optionally complementary treatments. Multiple questionnaires were administered via the Kaiku Health platform which provides ePRO monitoring and intelligent symptom tracking. Health-related quality of life, symptoms and functions were analyzed during the rehabilitation process and made available to patients and all disciplines involved in the rehabilitation program.

Questionnaire	Cumulative Number filled	By unique users
1 Minute Sit to Stand	108	75
1 Minute Sit to Stand - Beginn Reha	27	24
1 Minute Sit to Stand - Ende Reha	8	8
6 minuten Gehtest	109	76
6 minuten Gehtest – Beginn Reha	27	25
6 minuten Gehtest – Ende Reha	7	7
Aktivitäten des täglichen Lebens..	2	2
Anmendeformularer für die ambulante O-R Aargau	91	88
Anmendungsformular für die ambulante Rehabilitation	6	6
Aufnahme fragebogen zur ambulanten O-R	129	126
Chemotherapy symptom questionnaire	219	9
Distress-Meter	803	119
Distress-Thermometer	13	9
Notizen	240	109
NRS 2002	2	2
Pain	187	32
Patient satisfaction q.	50	47
QLQ EPIC	78	17
QLQ C30	1026	177
RT for Thoracic	26	2
Schmerzprotokol	181	20

Questionnaire	Cumulative Number filled	By unique users
ECOG	154	26
Edmonton symptom assessment	24	3
Ernährungszustand Teil 1	248	99
ESAS palliative	2	1
Fatigue	968	116
Fatigue and skin reaction	17	1
Fragen zur Ernährungssituation Teil 2	3	3
Hormonal therapy symptom questionnaire	55	9
IO symptom questionnaire	81	5
IPSS	7	1
Mamma group early symptoms	219	33
Mamma group late symptoms	134	24
MTT-PSFS	49	44
Pelvis Men / Pelvis Women	1 / 2	18 / 11
PSA value	27	10
PSS Fragebogen	44	11
Symptom questionnaires for breast area radiotherapy	105	9
Late follow-up of radiotherapy for breast cancer	15	6
Symptom questionnaire for pelvic area radiotherapy male	12	1
Symptom questionnaire for head radiotherapy	5	1
Symptom questionnaire for neck radiotherapy	12	1

Figure 1: Questionnaires which have been filled out by the patients. Majority logins of patients happen via mobile app (61.88%). Kaiku is easy to use and is accepted by the patients

Results

Of 160 patients invited until 10/2022, 153 registered for Onco-Reha and 127 completed the 12-week program. 152 patients used Kaiku for at least one questionnaire, with the majority using the platform regularly for ePROs and to exchange messages with the care team. Questionnaires included broad screening forms, the EORTC QLQ-C30 questionnaire, assessments of nutrition, fatigue, distress but also targeted questionnaires according to disease site. Monthly evaluations of quality of life (QoL) showed improvements of global quality of life, fatigue, emotional, role and social functioning during Onco-Reha but not of physical functioning. In a proportion of patients, gains during Onco-Reha decreased 2-3 months after ending the program.

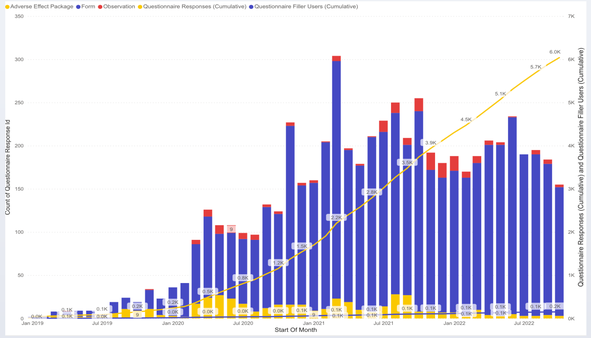

Figure 2: In Onko-reha, altogether 6872 different questionnaires have been filled out over time

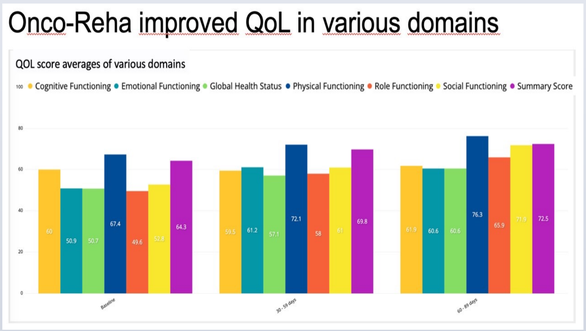

Figure 3: Quality of life is improving during ORA in various domains

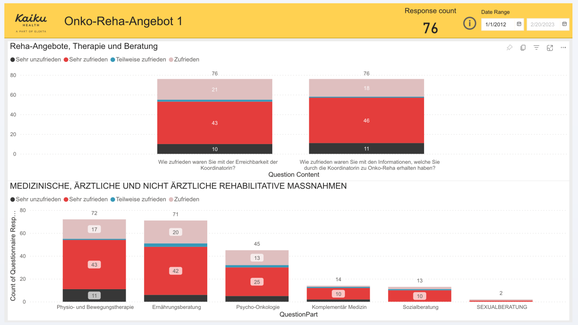

Figure 4: Most of the patients were very satisfied with the offers of the programme and they appreciated the procedure and the coordination process.

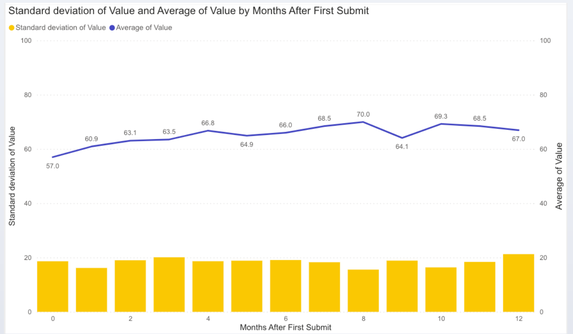

Figure 5: QLQ-C30 Quality of life showed a small but consistent decline 2-3 months after ORA in various domains

Figure 6: QLQ-C30: For example, emotional und social functioning showed a small but consistent decline 2-3 months after end of ORA and improved later on.

Discussion

After completion of acute cancer treatment, it is important to support patients in recovering physically and psychologically and to help them regain their social life. This is the goal of cancer rehabilitation (1). If we want to know which rehabilitation interventions are helpful, we must measure their effects. This can be done by asking clinicians, testing patients' performance, observing their behaviors, or by asking patients directly about their experience.
The most promising way to collect such data are electronic systems, which offer many advantages (4). Kaiku Health is a platform for digital health interventions. It provides patient-reported outcome monitoring and intelligent symptom tracking. The use of Kaiku Health helps cancer clinics provide optimized care through timely symptom management and improved workflow (5).
We now show that Kaiku effectively could be used to evaluate the interventions of Onko-ReHa. Patients and nurses regularly send messages and a multitude of different questionnaires have been filled out over time. The Kaiku platform and the interventions of Onko-Reha, including physiotherapy (group and individual treatment), psycho-oncology support, nutritional counselling, social services, nurse-led coordinative interventions and optionally complementary treatments were well accepted, and we could show a significant improvement of global quality of life, fatigue, emotional, role and social functioning during the intervention. This is in line with other investigators and publications (2,3,6).
2-3 months after the end of the Onko-Reha Intervention we saw a decline in various domains of quality of life due to impairment in emotional, social, and financial well being and fatigue as well as nausea. So far, this phenomenon has not been described in literature and should be further addressed to optimize the outcome of the patients.

Conclusion

Acceptance of ePROs and compliance with the Onco-Reha program was high and associated with measurable benefits in various domains of QoL as well as improvements of standardized clinical rehabilitation measures. ePRO assessment may predict patients who benefit most from the Onco-Reha program and how to identify and manage those who lose benefit after the 12-week program.

References

1. Smith SR, Zheng JY, Silver J, Haig AJ, Cheville A. Cancer rehabilitation as an essential component of quality care and survivorship from an international perspective. Disabil Rehabil. 2020;42(1):8–13.
2. Seib C, Anderson D, McGuire A, Porter-Steele J, McDonald N, Balaam S, Sapkota D, McCarthy AL. Improving health-related quality of life in women with breast, blood, and gynaecological Cancer with an eHealth-enabled 12-week lifestyle intervention: the women's wellness after Cancer program randomised controlled trial. BMC Cancer. 2022 Jul 8;22(1):747.
3. Licht T, Nickels A, Rumpold G, Holzner B, Riedl D. Evaluation by electronic patient-reported outcomes of cancer survivors' needs and the efficacy of inpatient cancer rehabilitation in different tumor entities. Support Care Cancer. 2021 Oct;29(10):5853-5864.
4. Wintner LM, Sztankay M, Riedl D, Rumpold G, Nickels A, Licht T, Holzner B. How to implement routine electronic patient-reported outcome monitoring in oncology rehabilitation. Int J Clin Pract. 2021 Apr;75(4):e13694
5. Iivanainen S, Ekstrom J, Virtanen H, Kataja VV, Koivunen JP. Electronic patient-reported outcomes and machine learning in predicting immune-related adverse events of immune checkpoint inhibitor therapies. BMC Med Inform Decis Mak. 2021 Jun 30;21(1):205.
6. Wood KC, Bertram J, Kendig T, Hidde M, Leiser A, Buckley de Meritens A, Pergolotti M. Community-based outpatient cancer rehabilitation services for women with gynecologic cancer: acceptability and impact on patient-reported outcomes. Support Care Cancer. 2022 Oct;30(10):8089-8099..