

# Evaluation of mobile health applications for cancer care using the MARS scale

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## INTRODUCTION

The European project Digital TRANSition and dIgiTal resilience in ONcology (TRANSITION) aims to improve digital competences in cancer care professionals. This includes the creation of a guide to digital tools used in cancer integrated management. To achieve this goal, a review of digital solutions (Deliverable 2.1 - *Systematic Review Results on the content of the use of digital solutions in the field of Oncology*) and the landscape of mobile applications designed for prevention, treatment, therapy, or support was explored (Deliverable 2.3 - *Guide to digital health tools*). Most of them did not have any evidence.

Consequently, **in this step, we aim to rigorously evaluate each app using a scale validated for this purpose**, useful for clinical professionals, non-clinical professionals, and patients/caregivers.

### RESEARCH QUESTION

► Which mobile cancer care apps score best using the MARS?

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## METHOD

### APPLICATIONS SELECTED

The mobile applications selected for evaluation by a systematic review  
(Pubmed, EMBASE, CINAHL (EBSCO), AppStore and Google play)

Apps was currently accessible, and the basic cost was free\*

\*Some of the selected apps have a paid upgrade (e.g., activating some features/content and removing advertising).  
In this study, only the free content of each app was evaluated



Three applications have been removed

- Go-Exap app requires administrator privileges to use
- eGVHD is no longer supported after the latest Android update
- NBIA Data Retriever app due to technical issues that prevented it from being used

A total of 18 apps were included for evaluation

most of them available for both Android and iOS and affiliated with commercial entities.

### Mobile App Rating Scale (MARS)

The apps were analysed using MARS (1-2). This is a tool for assessing the quality of mobile health apps that evaluates five constructs:

► Engagement ( $\alpha = .80$ ); Functionality ( $\alpha = .78$ ); Aesthetics ( $\alpha = .85$ ); Information ( $\alpha = .91$ ); App subjective quality ( $\alpha = .86$ )

### PROCEDURE

Application reviewers were trained  
in a workshop

A peer review of each of the  
applications included in the study was  
conducted by 19 trained reviewers



► In case the concordance between the reviewers was not reached (i.e. one point difference in sections A, B, C and/or D), a third evaluation was performed. Of the total number of apps, 10 received a third assessment

## RESULTS

APP	ENGAGEMENT (A)	FUNCTIONALITY (B)	AESTHETICS (C)	INFORMATION (D)	APP SUBJECTIVE QUALITY (E)	APP QUALITY MEAN SCORE (A+B+C+D)/4
ONCOassist	4.10	4.87	3.66	4.37	3.75	4.25
Oncology Board Review	3.47	4.33	4.11	4.24	3.17	4.03
Hematology & Oncology Consult	3.07	4.50	4.22	4.12	2.92	3.98
Radiation Oncology Exam Review	3.73	4.17	3.55	4.25	3.08	3.92
NCCN Guidelines®	3.20	3.62	3.83	4.75	3.87	3.85
ESMO Interactive Guidelines	3,60	4,62	3	4,10	3,87	3.83
Current Medical Diagnosis and Treatment	3,50	4,12	2,83	4,13	3,12	3.65
TNM Cancer Staging Manual	2.93	4.25	3.22	4.17	3.08	3.64
Pediatric Disease & Treatment	2.60	4.25	4.17	3.39	3.12	3.60
Radiation Oncology Q&A Review	2.93	4.17	3.67	3.59	2.66	3.59
Williams Manual of Hematology	3.20	4.37	3	3.58	2.62	3.53
All Diseases Treatments	2.50	4.62	4	2.95	2.50	3.52
Oncology Nursing Drug Handbook	3.07	3.75	3.78	3.11	2.66	3.43
Pharmacology for Nursing 2023	3.73	3.17	3.22	3.25	3.33	3.34
Washington Manual of Oncology	2.55	3.75	3	4.05	2.50	3.34
All Diseases Treatments 2023	1.90	4.37	3	3.20	2.37	3.12
Harrison's Manual of Medicine	2.60	3.67	3	3.15	1.83	3.11
Fitzpatrick's Color Atlas	2,60	3.33	2.78	3.12	2.58	2.96

### POINTS FOR DISCUSSION

- How important is the use of mobile apps in general practice?
- Do we need them to be rated using a consistent methodology based on predefined ranking criteria?
- Is there a lack of scientific evidence for new and existing health applications?

### REFERENCES

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- 2.Lu DJ, Girgis M, David JM, Chung EM, Atkins KM, Kamrava M. Evaluation of Mobile Health Applications to Track Patient-Reported Outcomes for Oncology Patients: A Systematic Review. Advances in Radiation Oncology. 2021 Jan;6(1):100576.

