COMMENTARIES ON MEDICAL INNOVATIONS, NEW TECHNOLOGIES, AND CLINICAL TRIALS

ORIGINAL PAPER

Urology apps: overview of current types and use

Guglielmo Mantica[1], Rafaela Malinaric[1], Federico Dotta[1], Irene Paraboschi[2], Giovanni Guano[1], Silvia Rebuffo[1], Massimo Garriboli[3], Nazareno Suardi[1], André Van der Merwe[4], Carlo Terrone[1]

[1]*Department of Urology, Policlinico San Martino Hospital, University of Genova, Italy*
[2]*Paediatric Surgery Unit, Istituto Giannina Gaslini, DiNOGMI University of Genova, Italy*
[3]*Paediatric Urology, Evelina London Children's Hospital, London, United Kingdom*
[4]*Department of Urology, Tygerberg Academic Hospital and Stellenbosch University, Cape Town, South Africa*

Citation: Mantica G, Malinaric R, Dotta F, et al. Urology apps: overview of current types and use. Cent European J Urol. 2020; 73: 369-372.

Article history
Submitted: April 18, 2020
Accepted: July 23, 2020
Published online: Aug. 7, 2020

Corresponding author
Guglielmo Mantica
Department of Urology
Policlinico San Martino Hospital
University of Genova
Largo Rosanna Benzi 20
16132, Genova, Italy
guglielmo.mantica@gmail.com

Introduction In recent years numerous applications have been developed with different purposes, aimed both at simplifying the lives of doctors and patients also within the urological field.
Material and methods In January 2020 we conducted a search in the Apple App Store and Google Play Store.
Results A total of 521 apps were reviewed, an increase of 8 times as compared to the last complete available review of eight years ago. Most of the urological apps are geared towards the patient and provide information and services to improve the understanding and treatment of different diseases. Some of these apps also get the patient directly in touch with healthcare staff allowing for an improvement in doctor-patient communication.
Conclusions Although the usefulness of many of these tools is undoubted, the problem of scientific validation, content control and privacy are not yet solved.

Key Words: app ‹› training ‹› education ‹› urology ‹› patients

INTRODUCTION

The current century is characterized by the global diffusion of technology [1]. Tablets and smartphones are now an integral part not only of our lives but also of our work as doctors. Their use allows us to quickly reach information, to update ourselves, exchange experiences and to plan our clinical practice in a more precise and detailed way. In particular, in recent years numerous applications have been developed with different purposes, aimed at simplifying the lives of doctors, nurses and patients [2, 3]. Urology has also been affected by this spread of apps and there is reason to predict that it will be further advanced in the years to come. To date, only two reviews are available regarding useful apps in the urological field, and they date back to many years ago [4, 5]. Since this area is constantly evolving, with numerous different innovations on a monthly basis, the goal of this mini-review is to attempt to provide an updated overview of the urological apps currently available on the market.

MATERIAL AND METHODS

In 01/2020 we conducted a search with the keyword 'urology', 'kidney', 'bladder', 'prostate', 'testicular' and 'andrology' using the search tab in the Apple App Store and Google Play Store. We included in the analysis all apps regarding urological diseases and providing a service to healthcare providers and/or patients. Apps not specifically focused on urological

pathologies, meetings/congresses/societies apps and those not available in English were excluded. The PRISMA guidelines [6] could not been applied since they are focused on reviews based on scientific papers. However, we aimed to follow their scheme to provide a precise and detailed data extraction.
The working method of Google Play and App Store is mainly based on finding keywords in the title, app descriptions and tags. For this reason, we decided to conduct a search strategy with a wide array of keywords, since it's unlikely that words such as the field (urology/andrology) or the involved organs were not included at least in one of the three.
The research was performed independently by two urologists (GM and RM) and any further discordance would be resolved by a third urologist (FD). When possible, the variables recorded were field/disease, customers, service provided, rating/feedbacks from the users, cost.

RESULTS

A total of 521 apps were reviewed, of which 172 were eligible for the final evaluation (Figure 1). The apps were divided into five different categories regarding their main aim (Table 1): education (42.4%), practice tools (31.5%), diaries/diets (13.9%), pelvic/physio-exercises (8.7%), communities (3.5%). Most of the apps were related to the urological field (87.2%) while about a third (32%) to andrology. Cancer was the focus in 70 apps (40.7%) while functional status in 116 (67.4%). Most of the apps were planned to be used by patients (58.7%) and doctors (52.3%). One hundred forty-four (83.7%) were free, while the remaining 28 had a very heterogeneous cost, from € 0.99 to € 64.49. The median rating given by the users was 4.4 (3.8–4.8).

Education

These applications can be divided by being addressed to healthcare providers or patients. The former are mainly apps for anatomical atlases or quizzes in preparation for professional exams. The second are mainly informational tools that provide basic information to patients to understand their pathology and any therapeutic management. The areas and topics of interest of this type of app are quite balanced between different fields.

Practice tools

Health professional involvement was evident in 70.4% of these apps. Most of these professional apps were score calculators or medical values (i.e. Nephrometry scores). Others were more practical apps, useful in clinical visits and able to provide basic uroflowmetry services, or as an app to plan the agendas of patients who need to perform periodic outpatient maneuvers (e.g. replacement of ureteral stents). Most of the tools for patients were aimed at self-checking (i.e. testicular self-examination) or at the easy finding of public toilets for patients with lower urinary tract symptoms (LUTS).

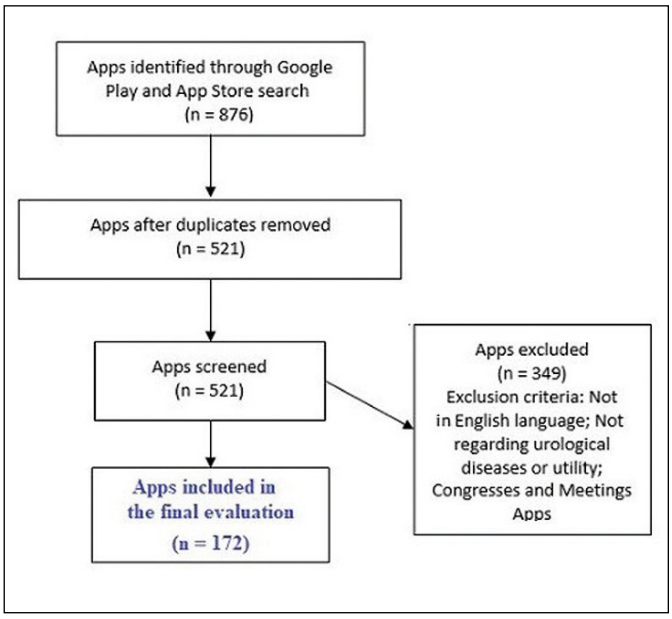

Figure 1. *Flowchart.*

Table 1. *Classification of the urological apps*

Type of app	N°	Urology	Andrology	Cancer	Functional	For patients	For doctors	For nurses	Rating	Cost
Education	73	56	43	43	49	36	41	14	4.2 (3.9–5)	free – 19.9
Practice tools	54	50	7	21	33	22	37	1	4.5 (3.8–5)	free – 64.49
Diary / Diet	24	24	1	1	23	23	1	1	3.9 (2.4–4.3)	free – 5.99
Pelvic / Physio excercises	15	15	0	0	15	15	0	0	4.5 (4.1–4.9)	free – 15.99
Community	6	5	4	5	1	5	1	1	4.4	free
	172	150	55	70	116	101	90	17	4.4 (3.8–4.8)	free – 64.49

Diaries/diets

Almost all of the applications had been designed to be at the service of the patient. Bladder diaries were very common, helping the patient control intake and output as well as urination frequency. Other applications were developed as diet diaries, providing real personalized diets for different pathologies (interstitial cystitis, prostatitis, urinary stones).

Pelvic/Physio-exercises

Most of these apps facilitated the execution of Kegel exercises or any type of rehabilitation exercises of the pelvic floor for both male and female incontinence.

Communities

The goal of these tools was to put patients with similar diagnoses in communication so that they could exchange information, knowledge but also simply provide emotional support. Some of these apps also allowed contact with health providers in order to clarify some doubts about the pathologies themselves and their management.

DISCUSSION

In 2012 Makanjuola et al. [5] provided the first complete review of apps used in the urological field. They identified a total of 69 apps using our keyword search and similar inclusion criteria. Eight years later, the results we achieved in our search were almost 8 times greater. At that time 65% of the apps found were aimed at physicians, 33% at patients and 2% at urology nurses. On the contrary, most of the present apps are mainly used by patients (58.7%). Similarly, there is an increase in the number of practical tools rather than educational apps [4]. Although they can certainly be helpful for patients and healthcare providers, the main issue concerns the regulation of their use, which is not yet well defined in many countries.

The Food and Drug Administration (FDA), updated in 2019, is the most recent and comprehensive legislation in this field [7]. In this way, the FDA has published a list of categories of health apps that do not qualify as medical devices and regulated the others. A similar comprehensive guidance has not been developed at an EU-level but it has been expected to be issued in 2020.

Another issue is that few apps are scientifically validated for effective and correct use by urologists and patients [8, 9, 10]. The current ratings are based on a user feedback rating system, unreliable and above all not scientifically valid.

This study has some limitations. The first is the absence of a specific set of guidelines for performing systematic reviews of this kind. However, to try to be as rigorous as possible, we have tried to adopt some of the principles of the PRISMA guidelines for data search. The second is given by the continuous and ever faster proliferation of these devices and applications, which in such a short time makes the evidences shown already dated. The third is about the working method of Google Play and App Store which takes multiple factors into account, such as app titles, developer names, and app descriptions. Furthermore, app visibility can depend on the device used for searching and the country where the search is performed. These factors make the search results possibly not perfectly reproducible by different users.

CONCLUSIONS

Smartphones are now an integral part of not only of our lives but also of clinical practice. From year to year, the number of apps that provide services of various kinds to urologists and patients is constantly increasing. Although the usefulness of many of these devices is undoubted, the problems of scientific validation, content control and privacy are not yet solved.

CONFLICTS OF INTEREST

The authors declare no conflicts of interest.

References

1. Gaboardi F, Mantica G, Smelzo S, et al. Robotic-assisted laparoscopic pyeloplasty with the use of the Contour™ stent: description of the technique and analysis of outcomes after the first 30 cases. Cent European J Urol. 2019; 72: 51-53.
2. Abbasi J. Meditation App Improves Attention in Young Adults. JAMA. 2019; 322: 495.
3. Rauschecker AM, Cook TS. App Review Series: RadioGraphics. J Digit Imaging. 2016; 29: 279-283.
4. Pereira-Azevedo N, Carrasquinho E, et al. mHealth in Urology: A Review of Experts' Involvement in App Development. PLoS One. 2015; 10: e0125547.
5. Makanjuola JK, Rao AR, Hale J, Bultitude M, Challacombe B, Dasgupta P. Urology apps: a review of all apps available for urologists. BJU Int. 2012; 110: 475-477.
6. Liberati A, Altman DG, Tetzlaff J, Mulrow C, et al. The PRISMA statement for reporting systematic reviews and meta-analyses of studies that evaluate healthcare

interventions: explanation and elaboration. BMJ. 2009; 339: b2700.

7. U.S. Food & Drug. Device Software Functions Including Mobile Medical Applications. Available at: https://www.fda.gov/medical-devices/digital-health/device-software-functions-including-mobile-medical-applications Consulted the 30th January 2020.

8. Mateu Arrom L, Peri Cusi L, López-Fando L, Franco de Castro A, Jiménez Cidre MÁ, Alcaraz A. Validation of a 3 day electronic bladder diary as an app for smart-phone. Neurourol Urodyn. 2019; 38: 764-769.

9. De Nunzio C, Lombardo R, Tema G, et al. Mobile phone apps for the prediction of prostate cancer: External validation of the Coral and Rotterdam apps. Eur J Surg Oncol. 2019; 45: 471-476.

10. Adam A, Hellig JC, Perera M, Bolton D, Lawrentschuk N. 'Prostate Cancer Risk Calculator' mobile applications (Apps): a systematic review and scoring using the validated user version of the Mobile Application Rating Scale (uMARS). World J Urol. 2018; 36: 565-573.