

THE LANCET

Digital Health

Supplementary appendix 1

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Appendix

Demand analysis for a digital solution providing a prehabilitation program for patients before surgery among key stakeholders

1. Introduction

Use of digital solutions such as electronic health records, electronic prescribing and medicines administration systems (ePMAs), telemedicine and mobile apps in patient care improves quality and safety of care and increases patient empowerment and satisfaction. Mobile apps continue to impact the healthcare industry and transform the patient-doctor experience by doctors on the one hand increasingly using mobile apps in their clinical practice and on the other hand advising their patients to use this technology.

Prehabilitation is a promising field in medicine that is gaining increasing attention from medical professionals, such as surgeons, anaesthesiologists and intensive care specialists. Studies have shown that prehabilitation programs increase quality of care by improving outcomes of surgery, decreasing complication rate after surgery and shortening the length of stay. Fewer complications and shorter hospital stays after surgery lead to significant reductions in the cost of patient care.

2. Aims and objectives

The aim of the study was to conduct a demand analysis among key stakeholders for a medical mobile app providing an individualized prehabilitation program for patients before surgery.

Additional aims of the study were:

- to define the level of doctors' familiarity with prehabilitation
- to determine doctors' readiness to adopt new digital solutions, their willingness to trust new products and the role of marketing of new digital products
- to determine the importance of a medical device CE marking when deciding to adopt a new product
- to determine hospital management's degree of investment in quality of care
- to determine the importance of positive medical opinion and economic rationale when deciding to invest in new products

3. Methodology

We conducted 15 interviews with doctors who work in perioperative medicine and eight interviews with members of hospital managements. In the group of doctors were general surgeons, cardiothoracic surgeons, orthopaedic surgeons, urologists, anaesthesiologists and internal medicine specialists who work in geriatric medicine.

In hospital management group were four CEOs of public general hospitals, a CEO of a tertiary referral hospital and three CEOs of privately owned clinics.

In-depth interviews were 30-45 long and were conducted either live or through a video call. A transcript was made for each interview after which we performed a qualitative data analysis.

4. Results

The key points based on our data analysis in the group of doctors were:

- Doctors working in perioperative medicine were aware of the concept, conditions and benefits of prehabilitation.
- Most doctors would like a standardized prehabilitation program for their patients, or have already discussed implementing such a program in their clinical practice. They would prefer to get a structured program rather than having to plan it themselves.

- Doctors thought remote prehabilitation program under doctor supervision is easier to implement than having an in-hospital program which requires patient transportation and hospital personnel (physiotherapists, nurses, administrative staff).
- Doctors used mobile apps in their workflow daily. All doctors thought digital solutions and especially medical apps would be an increasingly important part of their clinical work in the future.
- Some surgeons expressed the need for personal data collecting tool that they could use to track their patients' care progress and outcomes.
- Surgeons expressed the need to have a mobile app tool for primary evaluation of their patients prior to surgery and would be interested in an app providing that as a part of the prehabilitation program.
- Doctors learned about new (digital) products through colleagues, medical conferences, and medical journals.
- Doctors most trusted information about new products that come from colleagues who have had previous experience with the product. They would also consider a product valuable if they learned about it in a medical conference, but would not trust a product based on reading about it online, learning about it through advertising or personal sales.
- Most doctors valued a CE marking of a medical product, although this was not a prerequisite to start using one.
- Doctors were willing to positively influence hospital management when considering buying a new product to increase standard of care if they had been sure about the medical rationale.

The key points based on our data analysis in the group of hospital CEOs were:

- CEOs of private clinics and tertiary referral hospital were in general more willing to invest in products or services increasing quality and safety of care than public general hospitals CEOs.
- CEOs rely significantly on doctors' opinions and recommendations about products and services improving quality and safety of patient care.
- Shorter length of stay was the most important benefit of the prehabilitation program in terms of decreasing cost of care according to hospital CEOs.
- In terms of benefits of a prehabilitation program, CEOs most valued cost of care reduction and improved quality of care.
- Hospital CEOs believed that patient empowerment had an important role in the future of patient care.

5. Conclusion

There is a demand for structured prehabilitation programs among doctors working in perioperative medicine. Doctors consider a medical app providing a prehabilitation program to be a good solution for improving quality of care and would recommend it to hospital management. Hospital CEOs find doctor recommendation, a return of investment such as shorter hospital stays and insurance companies' incentive compensation the most important factors when considering a product or service for improving patient care.