MEPRO - Smart mobile phone application for self-assessment of mental distress

Improving patients' safety by assessing mental distress after surgery.

Surgical Hospital Rožna dolina, Ljubljana, Slovenija is a small surgical hospital, privately own but public financed, with approximately 7000 surgical procedures performed per year. Surgery is mainly oriented to orthopaedic and general surgery.

Challenge description

Mental distress - in this context-levels of mental, physical, and emotional stress can be high before and after surgery (common causes of stress include anything that results in pain, including illness and surgery)- can be alert or sign that patient has medical problems after discharge from hospital and he or she for various reasons does not want to speak about them with family, relatives, or physician. Detecting mental distress in individuals can be challenging because it often involves subjective experiences and emotions. However, there are several signs and indicators that may suggest someone is experiencing mental distress. It's important to note that these signs can vary from person to person, and some individuals may hide their distress, so it's not always easy to detect. There are some pre-screening systems for mental health distress designed to identify individuals who may be at risk for mental health issues or distress. These systems are often used in various settings, including healthcare, education, workplaces, and community organisations, to help assess and support individuals who may need mental health intervention.

According to research conducted by Surgical hospital Rožna dolina, there is no user-friendly mental distress self-assessment mobile phone application in the market that satisfies the demands of hospital (we call patient-oriented view): tailored to be connected with possible medical conditions and in Slovene language.

Although mental distress assessments are typically complex and require detailed evaluation by medical healthcare professionals, mobile version for self-assessment may be the first important step to alert family, relatives, or physicians that patient has medical problems (he or she is not willing to talk about).

Main group of patients: all adult patients discharged from hospital after general or orthopaedic surgery.

An indicator of the quality of life perceived by the patient is the VR-12 (see resources), validated method to measure general perception of quality of life.

Challenge main objectives

The main objective is to improve patient self-assessment and safety after discharge from hospital (and quality of life). As a secondary objective the Challenger also wants to learn the acceptance of tailored medical mobile solutions in elderly and to learn how to easily integrate 3rd party mobile solutions through its corporate IT system. After assessing the mental distress, the application should put the patient in contact with physician or member of family.

Solution functional requirements

Compulsory functional requirements

- The solution shall be user friendly for low digital literacy levels. The content shall be easy to digest by the patients, for example, using pictograms rather than text that captures patient's perspective on their mental condition after surgery.
- The solution shall allow Information exchange between patients and their surgeon.
  - Patient would choose from several templates to create the message, depending on the message type.
  - Doctors should be able to send the same message to patient.
- Calendar management: so, patients and physician can easily add or review patients' medical condition.
- Alert surgeon and family physician and family member that a change in mental condition needs their attention configurable through their channels of communication (smart phone, e-mail, etc.)
- Usable and intuitive for patients.
- When the user starts there will be available an application for local patients developed by Solver that incorporates, among others, user authentication. The new medical application must be called through authentication application, so user identification takes place under maximal safety conditions.
- The Solver application will be available for Android and iOS.

Desirable functional requirements

- Use of AI to recognize facial expression.
- Facilitate access to informative resources for self-empowerment, like documents, and videos. Including on a survey to assess quality of life indicator.
- Medication management. Possibility that doctors incorporate and modify prescriptions.
- Connection with 3rd party devices like smart bands or watches to track day activity and sleep patterns.
- Information summaries and analytics on the available data to empower patients and facilitate better disease management by the patients themselves, in collaboration with their doctor.
- Optimised for multi-device access.
- Including on a survey to assess quality of life indicator (VR-12) and to request and collect the patient outcomes over time.

Pilot scope

After beta version of application is prepared, 30 patients who underwent general or orthopaedic surgery will enrol in the pilot together with two physicians.

Language

- The application must be available in English and in Slovene language as the targeted population is not fluent in English.

Other aspects

- Patient must be owner of smart mobile device (smart phone).

Pilot set-up conditions

Ethical, legal, or regulatory

The approach of the pilot must be previously validated by an Ethics Committee of Medical faculty or National medical ethical board. The Committee will pay special attention to the collection of informed consents of patients by the Solver and the protection of personal data, observing the requirements established by the European data protection Regulation and Slovenian law.

If considered necessary, the Solver will be asked to anonymise the data according to mechanism established by the Challenger. At any case, the Solver cannot exploit or make the data for different purposes than the ones agreed with the Challenger and after pilot end, all copies of the data must be transferred back to the Challenger or deleted.

Technological

The systems and servers needed for running the piloted application will be hosted by the Solver. For safety reasons and data protection the Solver should have back up servers. Technological requirements will be established in a technical session at the beginning of the project.

Data access

No initial data will be provided for pre-load. All participants will have to register for free and fill their own data.

Expected impact and KPIs.

- Reduction in the number of physical visits of patients: a) to the doctor office at least 10% and b) to emergency room at least 20%.
- Quality of life indicator VR-12 (see resources). Increase of an average one point per month of usage, with a maximum 10 points during the total survey period.

Business opportunity

Market size

At the level of hospital organisation this project will be available in two hospitals with more than 20000 surgical discharges per year. At the national level there are more than 20 hospitals with the surgical units.

Presented application can be extended in a standard way with the same technology to many other pathologies, inside and outside starting hospital, with great possibility of growth.

Adoption plans

We plan to procure and scale up the solution in our organisation if the pilot is successful.

Resources

inDemand. (2020). inDemand stories.

inDemand (2018). EPICO Challenge - inDemand Call for Companies Murcia Region.

inDemand (2019). GRAVIDITY Challenge. inDemand Call for Companies Murcia Region.

InnoBuyer. (2023). InnoBuyer Webinar: How to master innovation needs identification.