App for monitoring postoperative pain. Usefulness in the development of a predictive machine learning model.

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Introduction. Since its inception, the Acute Pain Service (APS) has aimed to improve postoperative pain management and related complications. Over the years, the most recent guidelines have highlighted the priority for postoperative pain management to be increasingly tailored to the surgical procedure and, even more so, to the patient [1]. However, the weight the development and control of an APS service represents on routine work is not indifferent. This is documented by the frequent errors in the documentation of pain reported in literature [2]. It is made more evident by the need for more personnel that afflicts the current health system. New technologies allow us to improve pain monitoring, making the data available and the distribution of resources more efficient, in addition to developing postoperative pain prediction models with a large amount of data that could lead to predictive models (machine learning) to anticipate pain instead of just treating it.

Study Project.

The project consists of improving the APP in two phases:

The first one: is the development of an app for monitoring patients' pain in the postoperative period. Patients would be able to download the APP on phones. The patients control their pain by inserting their data into the APP. If the pain is not controlled, the doctor on duty will alert you through an APP available on a dedicated tablet. You can then decide what to do by checking the current protocol, whether to contact the delivery nurse or visit the patient and change treatment. Two televisits three and six months after surgery are also planned to evaluate the incidence of persistent post-operative pain.
Second Phase: With the dataset collected in the previous phase, a pain prediction system will be developed using artificial intelligence and machine learning. The analysis of the data will follow a well-consolidated methodology in the data science sector (the industrial sector has a standard called CRISP-DM, «Cross Industry Standard Process for Data Mining») that passes through the iteration of a Sequence of passes that must be distinguished that are followed correctly and do not maintain the integrity of the results, which should not be confirmed through the relative phase of analysis by an expert.

Conclusions: The new technology available will help better monitor, collect information and respond to the patient without overloading the staff. In addition, the large amount of data collected will help develop predictive models with artificial intelligence, improving treatment and reducing postoperative pain.

1. Osorio et al. Cir Cir 2022;90(2):197-201. doi: 10.24875/CIRU.20001360.
2. Levasi et al. ain Manag Nurs. 2023 Jan 13;S1524-9042(22)00220-X. doi: 10.1016/j.pmn.2022.12.001.