Cognitive Fuzzy Maps to engage doctors in decision support tools: A qualitative study

Objective

Given the complexity of the diagnostic process, experts have proposed the systematic use of decision support tools in everyday clinical practice could improve diagnostic reliability and reduce errors.

Some scholars have pointed out the valuable role of intuition in making good medical decisions. Experts often develop strategies based on the use of subtle clues to quickly infer important judgments without a complete information base. They called these strategies “mindlines” as opposed to guidelines.

We wanted to test if the use of Fuzzy Cognitive Maps (FCM) could help doctors in balancing intuitive and analytic thinking in their everyday clinical activities. FCMs can improve the diagnostic process by incorporating a cognitive balanced decision.

Method

To build an FCM, doctors are not required to quantify the importance of contributing information they only need an intuitive comprehension of a clinical scenario and the relevant factors that need to be considered. FCMs represent a complex system without a given direction, since each node may have several univocal or reciprocal connections with other nodes.

In this preliminary study, we have worked with a panel of doctors to build an FCM to be used in a neurology department. Then we gave the same doctors the possibility to use the FCM in their activities and recorded their use and opinion on a monthly base.

Results

Though the participants reported using rarely other decision support systems, the use of the FCM was frequent. Doctors reported that the FCM start to be a part of their thinking modality since they tried to integrate the data acquired with the patient in the schema built with the team. Finally, doctors reported to be satisfied and to be prompt do go on working on further FCMs.

Conclusion

In this preliminary study, we found that the use of FCMs might help doctors in overcoming most of the problem they encounter in the use of technology-driven decision support systems. We argue that the most important aspect of this method is that it involves directly doctors in a social and cognitive process. In this way, the support system becomes compatible with doctors’ mindlines.