



Development of the Joint Commission Taiwan - Smart Healthcare Standard (JCT-SHS)

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Background

The "smart healthcare" has become a popular term to reflect the level of IT involvement with healthcare services. However, hospitals around the globe are in different stages of information evolution; there is a lack of clear definition for so-called "smart healthcare". In this study we aim to develop and validate a survey standard to evaluate the level of hospital's IT involvement.

Methods

The quality improvement task force from the Joint Commission Taiwan (QITF-JCT) conducted structural literatures review to identify the key elements of major healthcare IT functions. Modified Delphi technique was used to review the importance and appropriateness of these elements through an expert panel. The JCT-Smart Healthcare Standard version 1.0 (JCT-SHS 1.0) was drafted. A total of 30 healthcare quality improvement campaign (HQIC) applications of 2018 were retrieved for evaluation through 9 dimensions of these key elements, including security, digitization, automation, interconnection, connectivity, interoperability, mobility, computation and artificial intelligence of particular hospital IT functions. The evaluations were conducted by 2 experts based on a 3-level rating scale (industry norm, excellent, innovative). The internal consistency and inter-rater reliability were investigated using Cronbach α and kappa statistics, respectively.

Results

In general, 9 IT function elements were evaluated for 35 HQIC application projects. The Cronbach α are 0.74~0.92, showing good internal consistency of JCT-SHS 1.0. The kappa correlation coefficients are security for 0.68, digitization for 0.47, automation for 0.21, interconnection for 0.82, connectivity for 0.35, interoperability for 0.28, mobility for 0.71, computation for 0.47, and artificial intelligence for 0.34, showing moderate to excellent inter-rater reliability.

Conclusions

The validation data show that JCT-SHS 1.0 is a consistent and reliable instrument to evaluate the levels of IT development in the delivery of particular healthcare services. Healthcare providers, external accreditation bodies, or policy makers can use JCT-SHS 1.0 to assess and to plan their organizational or system-wise IT strategy.

Dimensions	Definition
Security	Use of IT technology or the methods of access right management to improve the information security.
Digitization	Data can be saved in a storage and managed by IT technology, the data also can be queried or modified at any place.
Automation	The system can help to decrease the manual or process time in the workflow.
Interconnection	Two or more systems can connect to each other; they can use the same data without logging in again.
Connectivity	The system can connect with devices by using Wi-Fi, Bluetooth, etc. to collect and manage the data.
Interoperability	System or Software can exchange and utilize the data by using specific protocols.
Mobility	Use of mobile devices and APPs to utilize the data, such as monitor the vital signs, query the medical examination results.
Computation	Analyze the health data and used to develop mathematical models by using IT tools.
Artificial Intelligence	Use of algorithm tools to analyze the complicated data to assist physicians, managers to make decisions.