

The application of clinical alert system to reduce unexpected in-hospital cardiac arrest events

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INTRODUCTION

Unexpected cardiac arrest (In-Hospital Cardiac Arrest, IHCA) is an important indicator used by medical institutions to evaluate the quality of care. According to the annual report of the Patient Safety Notification System of the Medical Policy Association, there were 915 unexpected cardiac arrests in hospitals across the country in 2020, and 52% of the patients who were rescued died in the end. 60%-70% of IHCA patients have unstable symptoms 6-8 hours before cardiac arrest, but only 25% of patients will be aware of the unstable symptoms by the medical team. Therefore, with the assistance of the "Clinical Alarm System" (CAS), the nursing team can detect the patient's unstable condition early and intervene in a timely manner, thereby reducing the occurrence of unexpected cardiac arrest in the hospital.

METHOD

In order to detect and issue warnings in real time before the patient's condition deteriorates, the hospital has set up a Clinical Alert System (CAS), which is based on the patient's vital sign data (blood pressure, heartbeat and consciousness) collected through the nursing information system. Changes, etc.), supplemented by clinical observation of patient symptoms as a judgment, and according to the attributes of patients in different departments (medicine, surgery, obstetrics and pediatric wards), different physiological parameters and activation conditions are determined. According to the CAS setting activation condition information, the three activation conditions are: (1) systolic blood pressure less than 90mmHg, or greater than 220mmHg; (2) respiratory frequency less than 6 times per minute or greater than 30 times per minute; (3) heart rate less than 45 beats per minute, or greater than 130 beats per minute, with changes in consciousness or hemodynamic instability. The routine physiological parameters of patients are automatically monitored by the system, and the alertness of patients in high-risk groups is improved through the clinical warning system for critical patients. The hospital regularly checks and analyzes the correctness of the data collected by CAS and ensures the normal function of the system. Regular reviews are held in the emergency operation team to check unnecessary error alarms or failure to perform the alarm function of the system, so as to avoid delays for the team to detect and deal with it immediately.

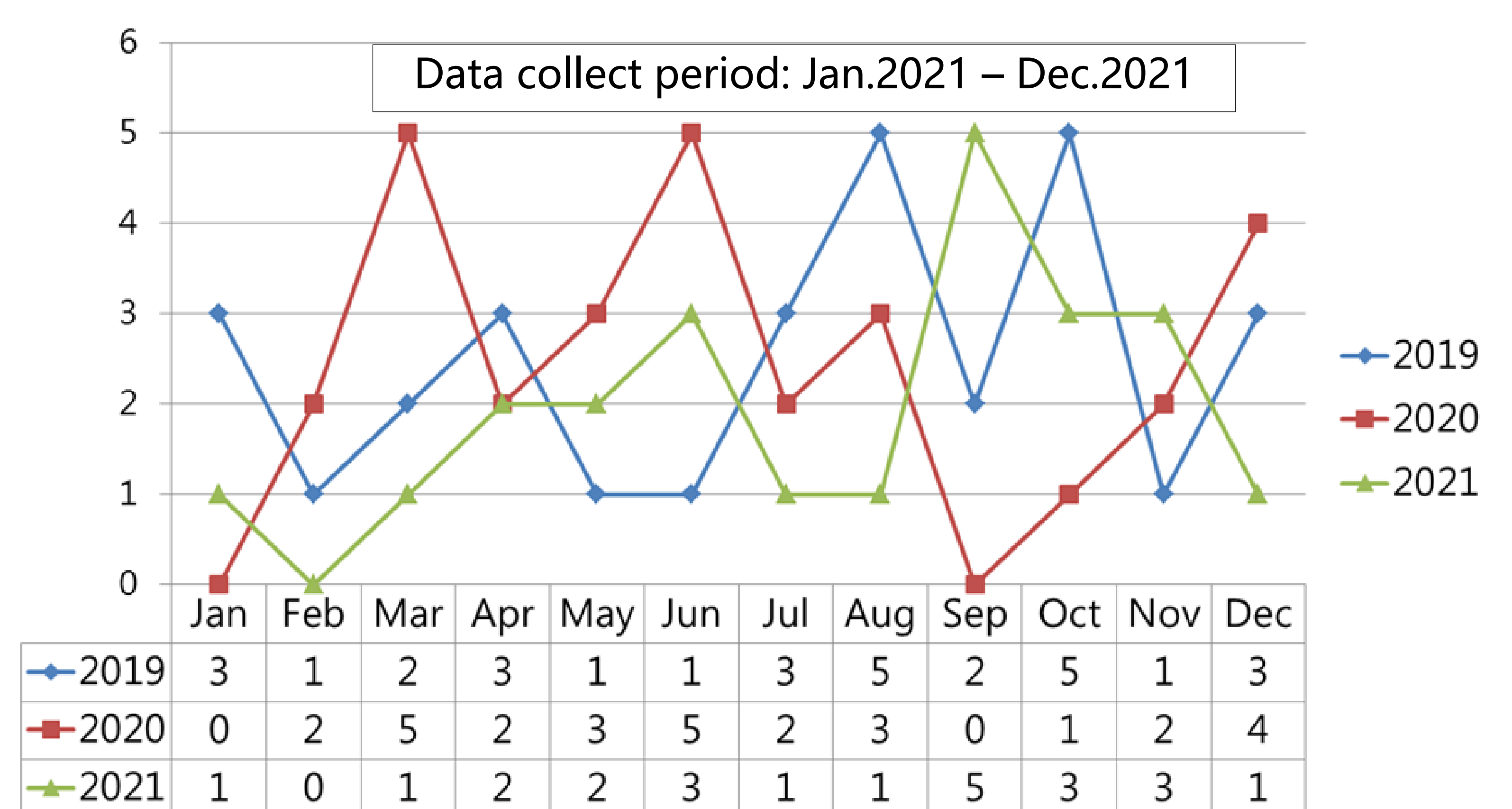
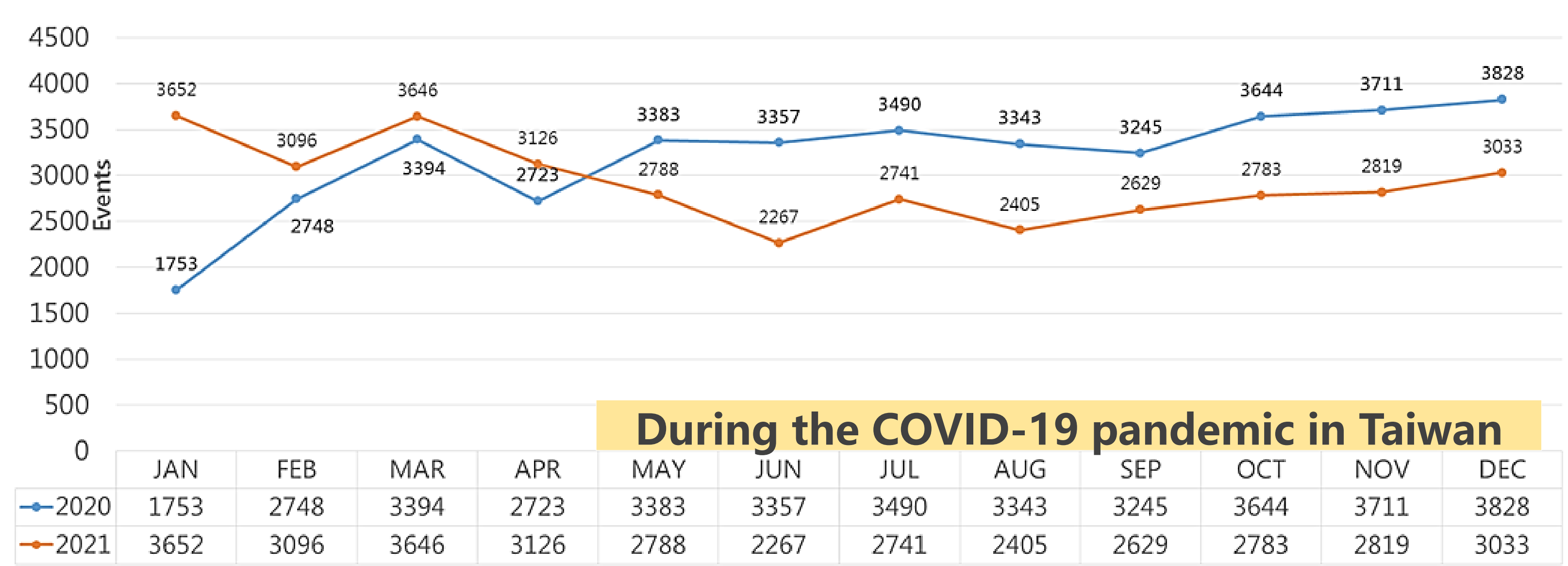
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RESULTS

Through the analysis of CAS monitoring data, in 2021, the total number of CAS activation records is 34,985 (31720 for adults/3265 for pediatrics), and a total of 431 people were transferred to ICU due to unstable vital signs monitored (416 for adults/15 for pediatrics); from January to December 2021, a total of 23 IHCA cases occurred, a decrease of 7 cases compared with 2019.

CAS events activated (month)



FINDINGS AND DISCUSSION

By using the "Clinical Alert System" (CAS) to detect unstable signs of patients in the early stage and intervene in time, it can reduce unexpected cardiac arrests in the hospital, increase the survival rate of emergency rescue, and reduce medical disputes; it can also enhance the relationship between medical care teams. Effective communication and teamwork to ensure patient safety and improve the quality of medical care.

KEYWORD

clinical alert system, In-Hospital Cardiac Arrest, Team communication unexpected cardiac arrest

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