Influence of administrative intervention on the availability, utilization, and competency for the use of defibrillators in primary hospitals

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To the Editor: Sudden cardiac death is a major public health issue across the world.[1] Timely cardiopulmonary resuscitation (CPR) and defibrillation helps improve prognosis and avert the neurological sequelae of ventricular fibrillation.[2] However, there is low availability and utilization of defibrillators in China.[3] Hence, we investigated the availability and utilization of defibrillators during two consecutive years (before and after an administrative intervention) at all primary (public and private) hospitals in Suzhou city (Jiangsu province, China) to assess the effect of administrative intervention.

All primary hospitals registered with the local health bureau in four districts (Industrial Park district, Hi-tech Zone district, Xiangcheng district, and Wuzhong district) and five county cities (Changshu city, Kunshan city, Taicang city, Zhangjiagang city, and Wujiang city) were included in this cross-sectional survey. The field survey was designed and conducted under the aegis of the Suzhou Municipal Health Bureau across all primary hospitals in the period November 27 to 29, 2013. The availability of automatic or manual defibrillators and the competency of personnel to operate defibrillators were investigated. The expert group reported the results of survey to the local health bureau, and suggested feasible corrective measures such as purchase of defibrillators, periodic maintenance, and provision of CPR training at each hospital. The Suzhou Municipal Health Bureau provided guidelines for further improvement of the surveyed hospitals (provision of funds, organization of training, and assessment). The survey was conducted again in the period November 26 to 28, 2014 and the results of the two surveys were compared to assess the effect of intervention. The survey forms are provided as Supplementary material 1, http://links.lww.com/CM9/A79 and 2, http://links.lww.com/CM9/A79. The attending physician and the chief nurse on-duty in the emergency room were selected for the assessment of defibrillator operation by two experts independently. The average score was considered as the final score.

A total of 137 hospitals were surveyed in November 2013 (94 public hospitals and 43 private hospitals). In 2014, a total of 137 hospitals were surveyed (95 public hospitals and 42 private hospitals). The number of hospitals equipped with defibrillators in 2013 (pre-intervention) and in 2014 (post-intervention) was 82 (98 defibrillators) and 88 (113 defibrillators), respectively. The corresponding defibrillation availability rate in the two consecutive years was 60% and 64%, respectively. Out of all available defibrillators, the number of in-service (normally operated) defibrillators in 2013 and 2014 was 57 (58%) and 79 (70%), respectively. Forty-eight (49%) defibrillators in 2013 and 78 (69%) defibrillators in 2014 were well managed which implies that the defibrillators were well in-service with complete maintenance records ($P = 0.003$). The average usage of each defibrillator was 0.73 times/year in 2013 and 0.45 times/year in 2014. In the private primary hospitals, the results of acquaintance test of doctors and nurses in 2014 (post-intervention) were significantly better than those in 2013 (pre-intervention) (doctors: 89 *vs.* 84, $P = 0.037$; nurses: 90 *vs.* 75, $P = 0.007$) [Table 1].

Primary hospitals serve the local communities and account for the majority of healthcare institutions in China. It is of critical importance to equip the primary hospitals with defibrillators and to adequately train the personnel in their use. Our results indicated that only two-thirds of all primary hospitals were equipped with defibrillators and that the utilization rate of defibrillators in the primary hospitals in Suzhou was still low. Administrative intervention can partially improve the status in this respect.

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Table 1: The availability and utilization of defibrillators before and after intervention.

Items	2013 (pre-intervention)	2014 (post-intervention)	χ^2/Z	*P*
Number of hospitals	137	137		
Number equipped with defibrillators	82 (60)	88 (64)	0.558	0.455
Number of defibrillators per hospital				
1	70 (51)	76 (55)	0.528	0.468
≥ 2	12 (9)	12 (9)	0.000	1.000
Number of defibrillators	98	113		
Equipped location				
Emergency room	70 (71)	86 (76)	0.596	0.440
Operation room	2 (2)	3 (3)	0.000	1.000
Other	26 (26)	24 (21)	0.813	0.367
In-service	57 (58)	79 (70)	3.162	0.075
Well managed*	48 (49)	78 (69)	8.768	0.003
Frequency of usage	72	51		
Average use of a defibrillator per year	0.73	0.45		
Doctor's score in public hospitals	93 (88, 95)	90 (83, 95)	−1.630	0.103
Nurse's score in public hospitals	91 (81, 95)	89 (76, 95)	−1.278	0.201
Doctor's score in private hospitals	84 (79, 89)	89 (84, 93)	−2.094	0.037
Nurse's score in private hospitals	75 (63, 85)	90 (84, 93)	−2.686	0.007

Data were shown as *n*, *n* (%), median (interquartile range). Chi-squared or Fisher exact test was used to compare categorical variables. The Mann-Whitney *U* test was used to assess between-group differences, *P* value less than 0.05 was considered statistically significant. *The term "well managed" implies that the defibrillators were in-service with complete maintenance records.

Conflicts of interest

None.

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