Original Article
Effects of integrated emergency nursing on first-aid efficacy, incidence of accidents during transfer, and nursing satisfaction of patients with cerebral apoplexy

Yingyuqing Zhu*, Rujia Han*, Yufei Li

Department of Emergency, The Central Hospital of Wuhan, Tongji Medical College, Huazhong University of Science and Technology, Wuhan 430000, Hubei, China. *Equal contributors and co-first authors.

Abstract: Objective: This study aimed to analyze the effects of integrated emergency nursing on the first-aid efficacy, incidence of accidents during transfer, and nursing satisfaction of patients with cerebral apoplexy. Methods: The first-aid data of 97 patients with cerebral apoplexy from February 2015 to August 2017 were retrospectively collected. Based on the first-aid nursing methods, those patients were divided into the Control Group (CG, n=48) for routine emergency nursing, and the Observation Group (OG, n=49) for integrated emergency nursing. The 2 groups were compared for the first-aid efficacy, prognosis, incidences of accidents during transfer, medical issues, complications and nursing satisfaction. Results: As compared with the CG, patients in the OG demonstrated shorter first aid response time before hospitalization and treatment time at the emergency department, higher survival rate (95.92% (47/49)) and satisfaction (97.96% (48/49)), lower mortality (4.08% (2/49)), fewer incidences of accidents during transfer (4.08% (2/49)), less medical issues (2.04% (1/49)), as well as lower levels of sequelae of neurological function, brain hernia and airway obstruction (2.04%, 2.04% and 2.04%) (P<0.05). Conclusion: The application of integrated emergency nursing in patients with cerebral apoplexy managed to raise the first-aid efficacy and nursing satisfaction, reduce incidences of accidences during transfer, and medical issues.

Keywords: Cerebral apoplexy, integrated emergency nursing, first-aid efficacy, transfer, accidents, satisfaction

Introduction

Clinically, cerebral apoplexy is a common acute cerebrovascular disease with high incidence [1]. The disease is caused by the blockage or the sudden rupture of cerebral blood vessels, which impedes the smooth blood flow into the brain, and then causes brain tissue damage. It can be divided into ischemic cerebral apoplexy and hemorrhagic cerebral apoplexy [2, 3], and is associated with many causes, including unhealthy lifestyle, age, race, gender and vascular risk factors [4].

Generally speaking, an acute cerebral apoplexy is always related to high disability and mortality. Therefore, in order to improve the prognosis of patients, rescue as early as possible is necessary [5, 6]. In the past, patients with cerebral apoplexy were usually treated with conventional first-aid modes, but the time from the call of

the patients to implementation of pre-hospital emergency was relatively long, which easily delayed the precious rescue time and may have certain impacts on the later treatment of patients. At the same time, the standardization and efficacy of this emergency care mode needs to be further improved [7, 8]. Integrated emergency nursing belongs to a new emergency treatment model, which can provide patients with convenient and rapid emergency nursing, save more rescue time and improve the success rate of rescue [9, 10].

Therefore, in order to improve the prognosis of patients with cerebral apoplexy, improve the effect of first-aid and shorten the rescue time, this study adopted the integrated emergency nursing, and compared its application effect with the conventional emergency nursing to highlight its effectiveness, which is feasible and innovative.

Materials and methods

Materials

The first-aid data of 97 patients with cerebral apoplexy in our hospital from February 2015 to August 2017 were retrospectively collected. A total of 30 males and 18 females were included into the CG for routine emergency nursing, and 32 males and 17 females were included in the OG for integrated emergency nursing. (1) Inclusion criteria: patients diagnosed with cerebral apoplexy through cranial CT scan and MRI, and with a NHISS (National Institutes of Health Stroke Scale) [11] score ≤18 were included. Informed consent from family members was obtained for participation in the study, which was approved by the Medical Ethics Committee of Wuhan Central Hospital. (2) Exclusion criteria: some patients were excluded as they suffered from massive cerebral hemorrhage, myocardial infarction, angina pectoris, severe arrhythmia or liver and kidney insufficiency.

Methods

For the OG, integrated emergency nursing was applied.

Establishment of a dedicated emergency nursing team

A dedicated emergency nursing team was set up with the head nurse, divisional/departmental directors and professional medical staff who were trained and qualified in a unified and standardized manner; each member was arranged to the corresponding post and required to comply with the corresponding accountability system. Five emergency nursing teams were established based on the clinical functions, including Pre-hospital emergency nursing, contact, circulating support, disposal and respiratory support. Each team was headed by a nurse with a title at or above nurse-in-charge.

Emergency nursing procedures

(1) Pre-hospital emergency measures: after receiving an emergency call, the pre-hospital emergency team immediately arranged an ambulance within 4 min; the principles such as "bleeding control", "effective maintenance of respiratory circulation" and "safe transfer" were strictly followed for on-the-spot nursing, evaluation and observation of patients' vital signs, pupils, and consciousness; the airway was unblocked quickly to make sure patients could breathe smoothly according to the principles of "effective, simple and convenient". In case of glossocoma, a breather pipe was inserted into the throat; for patients with stable conditions, high flow oxygen therapy was given through a nasal catheter. Any foreign object blocking the airway was removed in a timely manner, and assisted respiratory measures were taken in case of respiratory dysfunction; changes in vital signs were closely monitored, and changes in patients' conditions were carefully observed, in particular, breathing, blood pressure, pulse, pupils and consciousness, to learn about any intracranial hypertension. For patients taking deep or shallow and slow breaths, or with changes in the pupils, active first aid measures were adopted to avoid brain hernia; a venous access was established, and the detaining needle was left in the vena mediana. The puncture point was fixed to prevent fluid leakage. Based on patients' conditions, first aid drugs were selected, including 10-20 mg DXM and 250 ml 25% mannitol for markedly elevated intracranial pressure. In addition, control was exerted for blood pressure to be maintained with DBP and SBP between 100 and 105 mmHg, 160 and 180 mmHG. In case of excessively low or high blood pressure, corresponding drugs were given to prevent cerebral anoxia and worse conditions. For patient transfer, the timing is very important. As long as patients' conditions permitted, they were transferred to the hospital safely for early thrombolytic therapy as soon as possible, during which, patients' conditions were made know to their family members, including any possible accidents to earn their cooperation and trust. Furthermore, the transfer process was also accompanied with delivery of first-aid information. Through the onboard GPS mobile video terminal system, patients' realtime conditions and monitoring data were transmitted to the emergency department of the hospital to facilitate the preparation. (2) In-hospital emergency measures: the head of the in-hospital emergency team timely solved all technical difficulties during the emergency rescue through the information passed from the onboard GPS mobile video terminal system. As the patients were sent to the hospital, their conditions were evaluated again, and various measures were adopt-

ed, including circulatory respiratory support, examination, preoperative preparation, monitoring and transfer. The circulatory support team rapidly established a venous channel for patients, and maintained the circulation with drugs, while the disposal team was responsible for records, monitoring and evaluation. In such a process, the contact team accounted for communication with related departments and patients' family members. (3) In-hospital transfer: after bed-side B-ultrasound and X-ray examinations, patients were transferred to the assisted examination departments through the green channel, before which, those departments were contacted and informed for preparation. In the meanwhile, joint consultation and examination by the specialists were conduced, followed by transferring the patients directly to the wards or ICUs of the Department of Neurology to maximally reduce the number of transfer between departments. Before transfer, patients were comprehensively evaluated, and emergency drugs and appliances, including sputum aspirator and simplified respirator were prepared. The Pre-hospital emergency nursing staff was required to complete the registration form of green channel, register of transfer, and records of rescuing and nursing of patients in critical conditions. The information was handed over to the ward nurses in a written form and orally. (4) The case records for emergency nursing were prepared in tables to ensure the accurate and complete recording at the highest efficiency and shortest time.

For patients in the CG, a routine nursing scheme was followed, including nurses on duty before hospitalization, participation in the first aid with the ambulance. Instead of emergency nursing teams, nurses only took routine emergency nursing measures at the site, including establishment of venous channels and artificial airways.

Observation indexes

First-aid efficacy: including the first aid response time before hospitalization defined as the time elapsed from the receipt of an emergency call to the provision of professional nursing, and the treatment time at the emergency department calculated from the timing of hospitalization to the end of transfer.

Prognosis: the 2 groups were compared for survival and mortality.

Incidence of accidents during transfer: the 2 groups were compared for the incidence of accidents during transfer.

Medical issues: the 2 groups were compared for the incidence of medical issues and/or tangles during the first aid.

Incidence of complications: the 2 groups were compared for the incidence of sequelae of neurological function, brain hernia and airway obstruction.

Nursing satisfaction: patients' family members' satisfaction to the emergency nursing was investigated with a self-developed questionnaire which covers first-aid efficacy, attitude, quality, professional knowledge and expertise. With a full mark of 100, a mark above 90 indicates very high satisfaction, a mark between 60 and 90 indicates basic satisfaction and a mark under 60 indicates dissatisfaction. The total satisfaction rate = very satisfaction rate + basic satisfaction rate.

Statistical analysis

Statistical analysis was performed with SPSS 22.0. In case of numerical data expressed as Mean ± Standard Deviation, comparison studies were carried out through independent-samples t test for data which were normally distributed, and Mann-Whitney U test for data which were not normally distributed, paired test for pre-and-pro comparison in the group. In case of nominal data expressed as [n (%)], comparison studies were carried out through chi-squared test for intergroup comparison. For all statistical comparisons, significance was defined as $P<0.05$.

Results

Comparison between the 2 groups for general data

Male and female patients were 32 (65.31%) and 17 (34.69%) in the OG, and 30 (62.50%) and 18 (37.50%) in the CG. Patients in the OG were aged between 58 and 88 years old with a mean value of (68.52±1.28), while patients in the CG fell in the age range of 59 and 86 years with mean value of (68.49±1.25). The number of patients with ischemic cerebral apoplexy, hemorrhagic cerebral apoplexy, hypertension, coronary disease and diabetes were 33 (67.35%), 16 (32.65%), 13 (26.53%), 17

Table 1. Comparison between the OG and the CG for general data [n (%)]/($\overline{x} \pm s$)

Materials		OG (n=49)	CG (n=48)	t/X^2	P
Gender (n)	Male	32 (65.31)	30 (62.50)	0.083	0.774
	Female	17 (34.69)	18 (37.50)		
Age (y)		68.52±1.28	68.49±1.25	0.117	0.907
Apoplexy type (n)					
Ischemic cerebral apoplexy		33 (67.35)	31 (64.58)	0.083	0.774
Hemorrhagic cerebral apoplexy		16 (32.65)	17 (35.42)		
Type of complications (n)					
Hypertension		13 (26.53)	12 (25.00)	12.562	0.000
Coronary disease		17 (34.69)	16 (33.33)		
Diabetes		15 (30.61)	13 (27.08)		

Table 2. Comparison between the 2 groups for first-aid efficacy ($\overline{x} \pm s$, min)

Group	First aid response time before hospitalization	Treatment time at the emergency department
CG (n=48)	14.58±2.18	23.28±5.28
OG (n=49)	11.02±0.18*	17.02±1.28*
t	11.393	8.062
P	0.000	0.000

Note: *indicates P<0.05 as compared with the CG.

Table 3. Analysis of the prognosis between the 2 groups [n (%)]

Group	Case	Survival	Mortality
CG	48	2 (4.08)	11 (22.92)
OG	49	47 (95.92)*	37 (77.08)*
X^2		7.412	7.412
P		0.006	0.006

Note: *indicates P<0.05 as compared with the CG.

Table 4. Comparison between the 2 groups for the incidence of accidents during transfer [n (%)]

Group	n	Number of Cases (n)	Incidence (n)
CG	48	12	25.00
OG	49	2*	4.08*
X^2			8.591
P			0.003

Note: *indicates P<0.05 as compared with the CG.

(34.69%) and 15 (30.61%) respectively, in the OG, and 31 (64.58%), 17 (35.42%), 12 (25.00%), 16 (33.33%) and 13 (27.08%) respectively, in the CG. Between the 2 groups, no statistical difference was found in terms of gender, average age, apoplexy type, and com-

plications (P>0.05, **Table 1**).

Comparison between the 2 groups for the first-aid efficacy

In comparison with the CG, the OG had shorter first aid response time before hospitalization and treatment time at the emergency department (P< 0.05, **Table 2**).

Comparison between the 2 groups for prognosis

The survival and mortality were 95.92% (47/49) and 4.08% (2/49) in the OG, and 77.08% (37/48) and 22.92% (11/48) in the CG (P<0.05, **Table 3**).

Comparison between the 2 groups for the incidence of accidents during transfer

The incidence of accidents during transfer was 4.08% (2/49) in the OG, and 25.00% (12/48) in the CG (P<0.05, **Table 4**).

Comparison between the 2 groups for the incidence of medical issues

The incidence of medical issues was 2.04% (1/49) in the OG and 14.58% (7/48) in the CG (P<0.05, **Table 5**).

Comparison between the 2 groups for the incidence of complications

Only 1 case of sequelae of neurological function, 1 case of brain hernia and 1 case of airway obstruction were found in the OG with the incidence of 2.04%. In the CG, the cases were 7, 5 and 6 respectively, accounting for 14.58%, 10.42% and 12.50% respectively (P<0.05, **Table 6**).

Comparison between the 2 groups for nursing satisfaction

The number of patients' family members that were very satisfied, basically satisfied and dissatisfied with the nursing were 26, 22 and 1 respectively, in the OG with a total satisfaction

Table 5. Comparison between the 2 groups for the incidence of medical issues [n (%)]

Group	n	Number of Cases (n)	Incidence (n)
CG	48	7	14.58
OG	49	1	2.04
X^2			5.041
P			0.024

Table 6. Comparison of the incidence of complications between the 2 groups

Group	Case	Sequelae of neurological function	Brain hemia	Airway obstruction	Total incidence
CG	48	7 (14.58)	5 (10.42)	6 (12.50)	18 (37.50)
OG	49	1 (2.04)	1 (2.04)	1 (2.04)	3 (6.12)*
X^2					14.074
P					0.000

Note: *indicates P<0.05 as compared with the CG.

Table 7. Comparison of nursing satisfaction between the 2 groups

Group	Case	Very satisfied	Basic satisfaction	Dissatisfied	Total satisfaction
CG	48	19 (39.58)	18 (37.50)	11 (22.91)	37 (77.08)
OG	49	26 (53.06)	22 (44.90)	1 (2.04)	48 (97.96)*
X^2					9.748
P					0.002

Note: *indicates P<0.05 as compared with the CG.

rate of 97.96% (48/49). While there were 19, 18 and 11 cases respectively in the CG with a total satisfaction rate of 77.08% (37/48) (P<0.05, **Table 7**).

Discussion

Cerebral apoplexy is a type of acute cerebrovascular diseases with a high clinical incidence. It can bring serious damage to the body in a short period of time [12]. Research shows that 3-5 hours after the onset is the golden time for rescue. If the best window is missed, irreversible systemic pathological damage will be expected and accompanied by high mortality and disability rates [13, 14]. Therefore, in order to improve the success rate of rescue and reduce mortality, it is necessary to implement first aid for patients at the best window of time [15].

In this study, integrated emergency nursing was adopted in the first aid of patients with

cerebral apoplexy, including establishment of emergency teams based on clinical functions, in which, members were arranged to the corresponding posts and required to comply with the accountability system for the emergency posts, in order to give full commitment to their roles [16, 17]. Results of this study revealed that, compared with the CG, the OG had shorter pre-hospital first aid response time and rescue time in the emergency department (P<0.05), indicating that compared with the conventional first-aid nursing scheme, the integrated first-aid nursing scheme is beneficial to shortening the pre-hospital first-aid response time and the rescue time in the emergency department. To explore the mechanism of action, this can be attributed to the possible reasons: hospital emergency team members dispatched an ambulance within 4 min after receiving the emergency call; medical staff strictly comply with the relevant principles of patients before hospitalization, in-hospital first aid and in-hospital transfer; and first aid medical records are written in the form of tables to improve writing efficiency, save time and ensure accurate and complete records [18].

As an acute disease, cerebral apoplexy has high requirements on the quality of first aid, which is subject to factors such as design of nursing process, professional accomplishments of medical staff, and level of emergency nursing [19, 20]. In the integrated emergency nursing mode, coordination was performed amongst the pre-hospital first aid, emergency department and wards of the hospital to establish their cooperation in the first aid, so as save time as much as possible [21, 22]. In this study, a statistical difference was demonstrated between the 2 groups for survival and mortality, which were 95.92% (47/49) and 4.08% (2/49) in the OG (P<0.05); indicating that, the integrated emergency nursing mode is advan-

tageous to improve the success rate of first aid on patients with cerebral apoplexy. Secondly, the results of this study also showed that the incidences of medical issues, accidents during transfer, sequelae of neurological function, brain hernia and airway obstruction in the OG were significantly lower than those in the CG (P<0.05). This further demonstrated the effectiveness of the integrated emergency nursing, which helps to reduce the incidences of accidents, medical issues and complications. To analyze its mechanism of action, this is mainly due to the seamless connection achieved by the integrated emergency nursing model, which can overcome the disadvantages such as the delay of pre-hospital rescue, negligent monitoring during transfer, and the delay during consultation and examination, thus improving the quality of emergency nursing [23, 24]. Finally, the nursing satisfaction of the OG was higher than that of the CG (P<0.05), suggesting the enhancement of the integrated emergency nursing model. To explore its action mechanism, the patient's family satisfaction and the emergency efficacy have a close correlation with the quality of emergency care. The integrated emergency nursing scheme has higher professional skill requirements for the emergency nurses. In addition to the basic first-aid skill training, the medical staff was divided into groups based on the expertise, and rationally allocated with the rescue resources to improve the first-aid efficiency and effectiveness [25].

In conclusion, the application of integrated emergency nursing in patients with cerebral apoplexy can improve the first-aid efficacy and nursing satisfaction, and reduce the incidences of accidents during transfer and medical issues.

However, this study included only a few subjects and as such its results may not be representative enough, which we will make up for in future studies covering more aspects, samples and time points.

Disclosure of conflict of interest

None.

Address correspondence to: Yufei Li, Department of Emergency, Wuhan Central Hospital, No. 26, Shengli Street, Jiangan District, Wuhan 430000, Hubei, China. Tel: +86-13720145623; E-mail: yufeili29@163.com

References

[1] Hart RG, Catanese L, Perera KS, Ntaios G and Connolly SJ. Embolic stroke of undetermined source: a systematic review and clinical update. Stroke 2017; 48: 867-872.

[2] Wang W, Jiang B, Sun H, Ru X, Sun D, Wang L, Wang L, Jiang Y, Li Y, Wang Y, Chen Z, Wu S, Zhang Y, Wang D, Wang Y and Feigin VL. Prevalence, incidence, and mortality of stroke in China: results from a nationwide population-based survey of 480,687 adults. Circulation 2017; 135: 759-771.

[3] Yaghi S, Kamel H and Elkind MSV. Atrial cardiopathy: a mechanism of cryptogenic stroke. Expert Rev Cardiovasc Ther 2017; 15: 591-599.

[4] Suri R, Rodriguez-Porcel F, Donohue K, Jesse E, Lovera L, Dwivedi AK and Espay AJ. Post-stroke movement disorders: the clinical, neuroanatomic, and demographic portrait of 284 published cases. J Stroke Cerebrovasc Dis 2018; 27: 2388-2397.

[5] Melkumova E and Thaler DE. Cryptogenic stroke and patent foramen ovale risk assessment. Interv Cardiol Clin 2017; 6: 487-493.

[6] Gungor L, Polat M, Ozberk MB, Avci B and Abur U. Which ischemic stroke subtype is associated with hyperhomocysteinemia? J Stroke Cerebrovasc Dis 2018; 27: 1921-1929.

[7] Teng Z, Dong Y, Zhang D, An J and Lv P. Cerebral small vessel disease and post-stroke cognitive impairment. Int J Neurosci 2017; 127: 824-830.

[8] Aigner A, Grittner U, Rolfs A, Norrving B, Siegerink B and Busch MA. Contribution of established stroke risk factors to the burden of stroke in young adults. Stroke 2017; 48: 1744-1751.

[9] Nelson MLA, McKellar KA, Yi J, Kelloway L, Munce S, Cott C, Hall R, Fortin M, Teasell R and Lyons R. Stroke rehabilitation evidence and comorbidity: a systematic scoping review of randomized controlled trials. Top Stroke Rehabil 2017; 24: 374-380.

[10] Topcuoglu MA, Saka E, Silverman SB, Schwamm LH and Singhal AB. Recrudescence of deficits after stroke: clinical and imaging phenotype, triggers, and risk factors. JAMA Neurol 2017; 74: 1048-1055.

[11] Olivato S, Nizzoli S, Cavazzuti M, Casoni F, Nichelli PF and Zini A. e-NIHSS: an expanded national institutes of health stroke scale weighted for anterior and posterior circulation

strokes. J Stroke Cerebrovasc Dis 2016; 25: 2953-2957.

[12] Takashima N, Arima H, Kita Y, Fujii T, Miyamatsu N, Komori M, Sugimoto Y, Nagata S, Miura K and Nozaki K. Incidence, management and short-term outcome of stroke in a general population of 1.4 million japanese- shiga stroke registry. Circ J 2017; 81: 1636-1646.

[13] Caprio FZ and Sorond FA. Cerebrovascular disease: primary and secondary stroke prevention. Med Clin North Am 2019; 103: 295-308.

[14] Lokkegaard E, Nielsen LH and Keiding N. Risk of stroke with various types of menopausal hormone therapies: a national cohort study. Stroke 2017; 48: 2266-2269.

[15] Haussen DC, Grossberg JA, Bouslama M, Pradilla G, Belagaje S, Bianchi N, Allen JW, Frankel M and Nogueira RG. Carotid web (intimal fibromuscular dysplasia) has high stroke recurrence risk and is amenable to stenting. Stroke 2017; 48: 3134-3137.

[16] Raghuram K, Durgam A, Kohlnhofer J and Singh A. Relationship between stroke recurrence, infarct pattern, and vascular distribution in patients with symptomatic intracranial stenosis. J Neurointerv Surg 2018; 10: 1161-1163.

[17] Kwei KT, Liang J, Wilson N, Tuhrim S and Dhamoon M. Stroke severity affects timing: time from stroke code activation to initial imaging is longer in patients with milder strokes. Neurologist 2018; 23: 79-82.

[18] McElwaine P, McCormack J, Brennan C, Coetzee H, Cotter P, Doyle R, Hickey A, Horgan F, Loughnane C, Macey C, Marsden P, McCabe D, Mulcahy R, Noone I, Shelley E, Stapleton T, Williams D, Kelly P and Harbison J. Thrombolysis for stroke in Ireland: increasing access and maintaining safety in a challenging environment. Ir J Med Sci 2018; 187: 275-280.

[19] Khatib R, Jawaada AM, Arevalo YA, Hamed HK, Mohammed SH and Huffman MD. Implementing evidence-based practices for acute stroke care in low- and middle-income countries. Curr Atheroscler Rep 2017; 19: 61.

[20] Leung V, Sastry A, Srivastava S, Wilcock D, Parrott A and Nayak S. Mechanical thrombectomy in acute ischaemic stroke: a review of the different techniques. Clin Radiol 2018; 73: 428-438.

[21] Miller JS, English L, Matte M, Mbusa R, Ntaro M, Bwambale S, Kenney J, Siedner MJ, Reyes R, Lee PT, Mulogo E and Stone GS. Quality of care in integrated community case management services in Bugoye, Uganda: a retrospective observational study. Malar J 2018; 17: 99.

[22] Maru S, Nirola I, Thapa A, Thapa P, Kunwar L, Wu WJ, Halliday S, Citrin D, Schwarz R, Basnett I, Kc N, Karki K, Chaudhari P and Maru D. An integrated community health worker intervention in rural Nepal: a type 2 hybrid effectiveness-implementation study protocol. Implement Sci 2018; 13: 53.

[23] van Hedel HJA, Severini G, Scarton A, O'Brien A, Reed T, Gaebler-Spira D, Egan T, Meyer-Heim A, Graser J, Chua K, Zutter D, Schweinfurther R, Möller JC, Paredes LP, Esquenazi A, Berweck S, Schroeder S, Warken B, Chan A, Devers A, Petioky J, Paik NJ, Kim WS, Bonato P and Boninger M; ARTIC network. Advanced Robotic Therapy Integrated Centers (ARTIC): an international collaboration facilitating the application of rehabilitation technologies. J Neuroeng Rehabil 2018; 15: 30.

[24] Dovel K, Shaba F, Nyirenda M, Offorjebe OA, Balakasi K, Phiri K, Nichols B, Tseng CH, Bardon A, Ngona K and Hoffman R. Evaluating the integration of HIV self-testing into low-resource health systems: study protocol for a cluster-randomized control trial from EQUIP innovations. Trials 2018; 19: 498.

[25] Balikuddembe JK, Ardalan A, Khorasani-Zavareh D, Nejati A and Raza O. Weaknesses and capacities affecting the prehospital emergency care for victims of road traffic incidents in the greater Kampala metropolitan area: a cross-sectional study. BMC Emerg Med 2017; 17: 29.