

Prehospital Impact on Family Members of Road Traffic Accident

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Abstract

Background Prehospital care is nonexistent in most rural and semiurban areas. The implementation of golden hour care is still unachieved. The psychosocial problems of family members who accompany the traumatic brain injury (TBI) survivors after road traffic accidents (RTA) are not given attention during prehospital care. Therefore, the current study was aimed to understand the prehospital psychosocial impact on family members.

Methodology A cross-sectional study was conducted at the Emergency and Trauma Care Centre at National Institute of Mental Health and Neurosciences (NIMHANS), Bengaluru between July 2017 to April 2018. Forty-five ($n = 45$) referred family members providing care for trauma survivors were purposively recruited in the study. Structured checklists were administered to measure the psychological reactions and psychosocial problems experienced by the family members during prehospital care. Data analysis was analyzed using the R software 3.0.1 version.

Results TBI survivor's mean age was found to be 33 years (33.09 ± 13.20), of which males were 23 (51.1%) and females were 22 (48.9%), respectively. The result depicted first aid was provided by unskilled people after an average of 41 minutes (41 ± 30). The results further showed that family members had experienced agitation (100%), shock (82.2%), fatigue and headache (75.6%), depression (66.7%), feeling of hopelessness (55.6%) helplessness, and lack of support from family and financial constraints (48.9%) during prehospital care.

Conclusion Psychosocial interventions need to be provided during prehospital care by trained medical and psychiatric social work professionals to address the need of family members during the crisis.

Keywords

- ▶ prehospital care
- ▶ family members
- ▶ psychosocial problems

Introduction

After the accident, many patients suffer from traumatic brain injury (TBI) and secondary injuries such as hypoxia, hypercapnia, and hypotension.^{1,2} Thus, the first few hours

of prehospital care and immediate medical treatment after the accident are crucial to save lives and achieve a better prognosis.^{3,4} Prehospital care is defined as care and treatment provided at the accident scene or unexpected complication in an ambulance while transporting for medical care.⁵ The

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main goal of prehospital management is to prevent hypoxia and hypotension. Thus, the prehospital assessment, providing timely care is the most important.⁶⁻⁸

The impact of TBI is not only seen on patients but also the family members during the golden hour, and 80% of the accident victims do not receive immediate medical care, including first aid, within the golden hour care which is not satisfactory. Nonexistent prehospital trauma care services in rural or semi-urban areas, minimal first aid provided by untrained bystanders, lack of transport facilities, lack of awareness, and poor socioeconomic conditions have worsened the emergency.⁹⁻¹¹ Experiencing a range of psychosocial problems, difficulty in accessing trauma care, lack of awareness regarding trauma care centers during golden hour, emotional problems like shock, uncertainty, anxiety, fear, hopelessness, helplessness, and arranging finance to meet the medical expenses are significant factors which impact on family members.¹²⁻¹⁴ Besides, prehospital care and psychosocial research in TBI is lacking.¹⁵ Therefore, the current study focused to understand the psychological reactions of family members during prehospital care with the following specific objectives:

1. To know the status of prehospital care among the selected sample of TBI survivors.
2. To depict the psychological reactions undergone by family members during prehospital care.

Methodology

This cross-sectional study was conducted at the Emergency and Trauma Care Center, National Institute of Mental Health and Neurosciences, Bengaluru, between July 2017 to April 2018. The family members providing care for patients with TBI were recruited in the study. Family members who were not willing to participate in the study were excluded. The participants had explained the importance, aim, and objectives of the study. The written consent was obtained from all the recruited participants. Ethical clearance was attained from the institute. The semistructured questionnaire was used to collect the basic sociodemographic details of family members such as age, gender, marital status, level of education, occupational, financial status, and the relationship of family members with the patient.

A checklist was used to capture the psychosocial and physiological reactions of family members. The checklist was prepared to measure the grief reactions based on the theoretical model of Kubler Ross. Efforts were also made to measure the physiological and social reactions after the injury. This was simplified in terms of feelings (guilt, loneliness, sadness, anger, shock, denial, bargaining, depression, acceptance), behaviors (crying spells, social withdrawal, over-involvement, agitation), thoughts (a preoccupation of thinking about injured person, hopelessness, helplessness), and physical manifestations (poor appetite, insomnia, fatigue, headache, palpitations). ► **Table 1** gives the complete details. The time was set to measure the psychological reactions from the time of information received about the accident until reaching the trauma care center.

Table 1 Checklist for psychosocial and physiological reactions of family members

Feelings	Guilt	<input type="checkbox"/>
	Loneliness	<input type="checkbox"/>
	Sadness	<input type="checkbox"/>
	Anger	<input type="checkbox"/>
	Shock	<input type="checkbox"/>
	Denial	<input type="checkbox"/>
	Bargaining	<input type="checkbox"/>
	Depression	<input type="checkbox"/>
	Acceptance	<input type="checkbox"/>
	Behaviors	Crying spells
Social withdrawal		<input type="checkbox"/>
Over involvement		<input type="checkbox"/>
Agitation		<input type="checkbox"/>
Thoughts	Preoccupation with thinking about injured person	<input type="checkbox"/>
	Hopelessness	<input type="checkbox"/>
	Helplessness	<input type="checkbox"/>
Physical manifestations	Loss of appetite	<input type="checkbox"/>
	Insomnia	<input type="checkbox"/>
	Fatigue	<input type="checkbox"/>
	Headache	<input type="checkbox"/>
	Palpitations	<input type="checkbox"/>

All the questions were framed in English and Kannada (vernacular) language. The instructions were given clearly to ensure that the study participant understood the content of the questionnaire. The questionnaires were distributed to the study participants who could read, and they were asked to respond by ticking the questions in the given space. Participants who faced difficulty in completing the questionnaires due to illiteracy or persons who were under preoccupation with the patient conditions were aided by a trained psychiatric social worker (PSW). The PSW assisted them by reading the questionnaire, ensuring comprehension, and recording their respective answers. TBI survivor's demographic details and history of illness were collected from hospital records.

Descriptive statistics for the continuous variables were reported as mean ± standard deviation (SD), and categorical variables were summarized as frequencies and percentages. Data analysis was done using the R software 3.0.1 version.

Results

Sociodemographic Details

Forty-five ($n = 45$) family members were included in the study. The majority of the family members were female (30, 66.7%) and males were 15 (33.3%). It was also found that primary family members were either mother or father 12 (26.7%), son or daughter 11 (24.4%), spouse 9 (20%), sister or brother 8 (17.8%), and sister-in-law or brother-in-law 5 (11.1%). More than half belonged to below poverty line (BPL) 23 (51%) and 22 (49%) were from the above poverty line (APL). Thirty-three (73%) hailed from a rural background and 12 (27%) were from urban backgrounds. The majority of the family members believed in the Hindu religion (84.4%) and 7 (15.6%) were from nonHindu backgrounds such as Islam and Christianity. ► **Table 2** depicts the family members' demographic details.

TBI survivors' mean age was found to be 33 years (33.09 \pm 13.20), of which males were 23 (51.1%) and females were 22 (48.9%), respectively. The educational level of the patients was found to be 21 (46.3%) who had completed primary or secondary level of education, graduation 14 (32%) and illiterate 10 (22.2%). The majority of the patients were diagnosed with subdural hematoma 43 (93.3%), epidural hematoma 2 (4.4%), and contusion 1 (2.2%). ► **Tables 3 and 4** depicts the TBI survivor's demographic details and illness characteristics.

Prehospital Care

Majority of the patients had met with an accident in the morning (6 a.m. to 9 a.m., 16 [35.6%]), early morning (3 a.m. to 5 a.m., 13 [28.9%]), and night (around 6 p.m. to 10 p.m. 4 [8.9%]). The accident took place at circles or cross roads 25 (55.6%), service roads at village 10 (22.2), and nearby school or workplace 4 (8.8%).

Besides, good Samaritans or general public 25 (55.7%), police 9 (20%), friends 6 (13.3%), and auto drivers 5 (11%) helped in terms of moving the patient to the safer side of the accident spot, calling 108 ambulance services, and shifting the TBI survivors to a nearby hospital. The study results described that the majority of 30 (67%) of the TBI

survivors were shifted by 108 ambulances, private ambulance 10 (22%), and used bus /car /auto 5 (11%). First aid was provided to TBI survivors by good Samaritans or general public 20 (44.5%), staff nurses 19 (42.2%), and medical physicians 6 (13.3%).

Pathways of Prehospital Care

The results showed that hospital shopping was done to gain timely access to prehospital care. The majority of family members travelled along with TBI survivors from accident spot (AS) to general hospital (GH) and from there to government tertiary trauma care centre (GTTCC) 30 (66.7%). Further, AS to private hospital (PH) to another PH to GTTCC 7 (15.6%), AS to primary health care centre (PHC) to GTTCC 4 (8.9%), and AS to directly GTTCC were only 4 (8.9%). Overall, on an average 41 minutes (41 \pm 30) later, first aid

Table 2 Family members' demographic details

Variable	Category	n (%)
Gender	Female	30 (66.7)
	Male	15 (33.3)
Relationship with family members	Mother or father	12 (26.7)
	Sister or brother	8 (17.8)
	Sister-in-law or brother-in-law	5 (11.1)
	Son or daughter	11 (24.4)
	spouse	9 (20)
Family status	APL	22 (49)
	BPL	23 (51)
Domicile	Rural	33 (73)
	Urban	12 (27)
Religion	Hindu	38 (84.4)
	NonHindu	7 (15.6)

Abbreviations: APL, above poverty line; BPL, below poverty line.

Table 3 Descriptive statistics

Variable	Mean \pm SD
TBI survivor age (in years)	33.09 \pm 13.20
Family members age (in years)	37.62 \pm 12.40
Time is taken to receive first aid at the accident site (minutes)	41 \pm 30
Time is taken by family members to reach the accident place (minutes)	131.56 \pm 130.9

Abbreviations: SD, standard deviation; TBI, traumatic brain injury.

Table 4 TBI survivor's demographic and illness characteristics

Variable	Category	n (%)
Gender	Male	23 (51.1)
	Female	22 (48.9)
Education	Graduation	14 (32)
	Illiterate	10 (22.2)
	Primary and secondary education	21 (46.3)
Diagnosis	SDH	42 (93.3)
	EDH	2 (4.4)
	Contusion	1 (2.2)
Time of accident	Afternoon	16 (35.6)
	Evening	12 (26.7)
	Early morning	13 (28.9)
	Night	4 (8.9)
Site of accident	Highway nearby village	25 (55.6)
	Circles or crossroads	6 (13.3)
	Village road	10 (22.2)
	Nearby school or workplace	4 (8.8)
Where were the family members at the time of the accident	Home	37 (82.2)
	Traveling along with the victim	4 (8.9)
	Workplace	4 (8.9)
Who helped at the AS	Auto driver	5 (11)
	Friends	6 (13.3)
	Police	9 (20)
	Public	25 (55.7)
Who provided first aid at AS	Medical professionals	6 (13.3)
	Hospital staff/staff nurse	19 (42.2)
	General public/ Good Samaritan	20 (44.5)
Mode of travel to reaching trauma care center	108 ambulance	30 (67)
	Private ambulance	10 (22)
	Bus/car/auto	5 (11)

Abbreviations: AS, accident spot; EDH, epidural hematoma; SDH, subdural hematoma.

was provided by trained medical or paramedical. ►Fig. 1 depicts the pathway of care.

RTA Impact on Family Members in Prehospital Care

After hearing the accident of their loved one, family members took 131.56 minutes (131.56 ± 130.9) to reach the accident spot. Family members experienced negative feelings, negative thoughts, and stress-induced behavioral and physical problems during prehospital care.

The majority of family members experienced shock (82.2%), sadness (68.9%), depression (66.7%), bargaining or acceptance (64.4%), loneliness (35.6%), anger (28.9%), and denial (24.4%); the least percentage of family members experienced guilt (22.2%).

Family members exhibited behavioral problems such as agitation (100%), crying spells (73.3%), over-involvement (71.1%), and social withdrawal (22.2%). Further, family members had negative reactions such as the being preoccupied (100%), while more than half caregivers had a feeling of hopelessness (55.6%) and helplessness (48.9%).

All family members manifested physiological changes such as heart palpitations (100%), fatigue (75.6%), headache (75.6%), not feeling like having food (71.1%), and insomnia (62.2%) while preaccompanying the TBI survivor during prehospital care.

The results showed that the majority of family members were at home (82.2%) at the time of the accident, traveling along with TBI survivor 4 (8.9%), and engaged in occupational activities (8.9%) in the field. Further, family members also struggled with a lack of support from family (48.9%) and lack of financial support (48.9%) during prehospital care. The study results also identified a few other needs like lack of information and timely transport to reach the accident spot (24.4%) which were identified as major barriers. ►Table 5 shows the family members' psychosocial problems experienced during prehospital care.

Discussion

The study aimed to understand the prehospital care status and psychosocial impact on the family members beyond the golden hour. Family plays a key role in treatment decision-making on behalf of the patients. However, the psychosocial concerns of family members were least prioritized

and unaddressed during prehospital care. It is also observed in the Indian context, research work on family members' perceptions and psychological reactions during prehospital care is less explored.¹⁵ Thus, the present study significantly contributes to trauma care research from a psychosocial perspective.

Status of Prehospital Care

The current study findings revealed that the majority of the accidents took place in the morning or early morning and night, particularly at crossroads, service road junctions, nearby schools, and workplaces. A recent study reported that more accidents occurred between 9 PM to 7 AM¹⁶ Our study findings emphasize the establishment of traffic signals and visible signboards at service roads and schools.

Good Samaritans, police, auto drivers, and known friends helped in terms of calling the ambulance and shifting the TBI survivors to the nearby hospital. The results further showed that most of the time 108 ambulance services along with other vehicles like bus or car or auto were available for the needy during the golden hour or after. Ambulances (common emergency number 108) and auto-rickshaws are the most frequently used transport from the AS to the hospital as well as the interhospital referral.¹⁰ Prehospital transport is restricted in poor resource settings, and families use the available transport to reach the hospital.^{8,17} The present finding is consistent with the fact that transport facilities during prehospital care were available but far away from complete satisfaction of family members.

The present results depicted that first aid was provided to TBI survivors by good Samaritans, patrolling police, bystanders, and family members before shifting the survivor. Reviews show that stopping the bleeding and immobilization were the most common types of first aid provided by untrained people such as good Samaritans, police, and family members. Adding to that, lack of education, poor training standards for paramedics, and lack of manpower bring in unskilled persons to provide first aid at the AS.^{17,18} The present study findings emphasize that there is an urgent need to provide basic first aid training to the general public, traffic, patrolling police, and auto drivers. There is also a need for prompt and proper training for the paramedical and medical professionals to save the life of the injured person until the survivor reaches the trauma care center or nearby hospital.

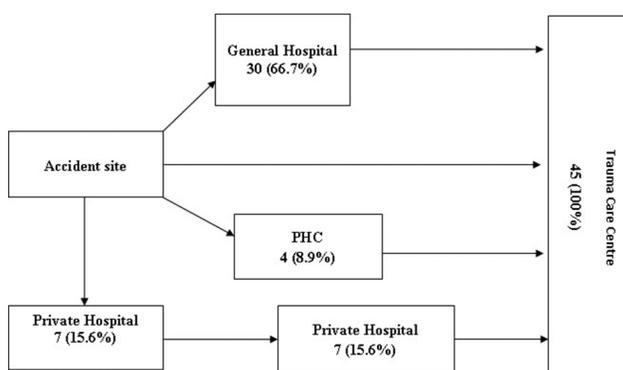


Fig. 1 Pathway of care after traumatic brain injury (TBI) 4 (8.9%) (direct).

Pathway of Care and Psychosocial Impact on Family Members

Only a less proportionate TBI survivors had got the right referrals and directions to reach AS to GTCC for treatment directly. Most of the TBI survivors along with family members had approached multiple hospitals such as GH, PH, PHC, and then finally GTCC for trauma treatment and care. Further findings showed that most of the family members were not aware of the accident and unable to reach the AS in time or immediately even after receiving information due to barriers such as long distance, not able to leave the half-done work in the workplace, and lack of timely transport facilities. As a result, family members took 131.56 minutes ($131.56 \pm$

Table 5 Family members psychosocial and physical reactions accompanying the TBI survivors during prehospital care

Variable		Response	n(%)	
Family members feelings	Guilt	Yes	10 (22.2)	
		No	35 (77.8)	
	Loneliness	Yes	16 (35.6)	
		No	29 (64.4)	
	Sadness	Yes	31 (68.9)	
		No	14 (31.1)	
	Anger	Yes	13 (28.9)	
		No	32 (71.1)	
	Shock	Yes	37 (82.2)	
		No	8 (17.8)	
	Denial	Yes	11 (24.4)	
		No	34 (75.6)	
	Bargaining	Yes	29 (64.4)	
		No	16 (35.6)	
	Depression	Yes	30 (66.7)	
		No	15 (33.3)	
Acceptance	Yes	29 (64.4)		
	No	16 (35.6)		
Behavioral reactions	Crying spells	Yes	33 (73.3)	
		No	12 (26.7)	
	Social withdrawal	Yes	10 (22.2)	
		No	35 (77.8)	
	Over involvement	Yes	32 (71.1)	
		No	13 (28.9)	
	Agitation	Yes	45 (100)	
		No	0	
Family members' thought reactions	Preoccupied thinking about the injured person	Yes	45 (100)	
		No	0	
	Hopelessness	Yes	25 (55.6)	
		No	20 (44.4)	
	Helplessness	Yes	22 (48.9)	
		No	23 (51.1)	
Physical manifestations	Not eaten	Yes	32 (71.1)	
		No	13 (28.9)	
	Insomnia	Yes	28 (62.2)	
		No	17 (37.8)	
	Fatigue	Yes	34 (75.6)	
		No	11 (24.4)	
	Headache	Yes	34 (75.6)	
		No	11 (24.4)	
	Heart palpitations	Yes	45 (100)	
		No	0	
	Social needs	Lack of information and transport	Yes	11 (24.4)
			No	34 (75.6)
Lack of support from family		Yes	22 (48.9)	
		No	23 (51.1)	
Lack of financial support		Yes	22 (48.9)	
		No	23 (51.1)	

Abbreviation: TBI, traumatic brain injury.

130.9) to reach the AS after hearing about the accident in the present study.

Family members were dissatisfied to access the golden hour care. This finding goes in line with previous studies which also report that prehospital care is nonexistent in most rural and semiurban areas, implementation of “golden hour care” is poor, and accessing trauma care services in the outskirts of the cities difficult.⁹ Thus, there is an urgent need to establish a trauma care center in the highways as well as in the rural areas to get timely treatment to provide basic life support care, in order to save the TBI survivors. This will help to save the reproductive age group and strengthen the Indian economy in the country. An earlier study reports that the economic loss due to TBI is phenomenal, although it is not explored in the developing countries.¹⁹ In addition to this, family members had experienced a range of psychosocial problems such as shock, agitation, anxiety, fear, anger, distress, helplessness, hopelessness, loss of appetite, headache, fatigue, insomnia, lack of support from family, and financial struggles. Informational and educational needs were unmet. Literature also reports that the unmet needs of prehospital care create misery among family members besides TBI survivors.²⁰ Financial constraints and advice, and emotional and social support are lacking in general among TBI family members during in emergency time.^{21,22} Educational levels, religious background, pre-existing family interaction, trauma details, and financial challenges triggered by injury will disturb the family functioning under stress.²³ Family members' psychosocial problems in prehospital care on a larger sample and family functioning after TBI is a potential area for further research.

Conclusion

In India, the transportation for TBI survivors have improved and facilities like 108 are a boon for the survivors due to the public-private partnership. First aid by trained professionals and timely surgical interventions were delayed due to inadequate trauma care center in highways, especially in rural areas. Further, family members experienced psychological reactions such as shock, denial, distress, and uncertainty. Therefore, we suggest that psychological and psychosocial interventions need to be provided during prehospital care by trained mental health professionals such as medical and PSW to address the TBI-caused crisis, negative psychological reactions, and psychosocial issues. Providing the right information and creating awareness is the need of the hour for the prevention of the RTA/TBI. Thus, we recommend appointing trained medical and PSW in polytrauma centers, emergency, and trauma care services to address the crisis.

Conflict of Interest

None declared.

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