



PEDESTRIAN'S ACCIDENTS AND AWARENESS: A STUDY OF DHAKA CITY, BANGLADESH

Khan Rubayet Rahaman^{1*}, Md. Zakir Hossain¹, Md. Ashiq-ur-Rahman¹ and Sadia Afrin²

¹ *Urban and Rural Planning Discipline, Khulna University, Khulna 9208, Bangladesh*

² *Bangladesh University of Engineering and Technology (BUET), Dhaka, Bangladesh*

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Abstract: Pedestrians' accidents in developing country may have been exceedingly occurred due to more people making trips on foot. Fifty two percent of the total trips in Dhaka City are made on foot everyday. This number is significant because walking is convenient and it saves time and money for the middle income group of people. However, much attention was not paid for the pedestrian safety and record of pedestrian injuries in Dhaka City. It also reveals from the experiences that the leading causes of pedestrian-vehicle conflicts are as pedestrians always walk along the roadsides and pedestrian violate the road crossing regulations. For this, small, medium and fatal injuries of pedestrians are found now and then in the city area. Lack of awareness and least involvement of the law enforcement authority also allow pedestrian accidents in the city area. This paper tries to focus the causes and types of pedestrian accidents in Dhaka City along with different age, sex and income groups. It also tries to identify the most vulnerable city areas to the pedestrians for accident in the specific time of the day. On the other hand, the safety awareness of the road-users would also involve in the present study. This study also guides the concern authorities to think more about the design and safety considerations of the pedestrian ways and the registration system of the pedestrian injuries. This research is based on primary data from the field survey. However, secondary sources have been used to support the present scenario of pedestrian's accidents and awareness in Dhaka city.

Key words: Pedestrians, accidents, awareness, Dhaka city

Introduction

Pedestrians are a particularly more susceptible group to face accidents at the time of road using than any others road users in developing countries. In part this is due to the high proportion of journeys made on foot, a lack of footpath facilities, and poor road user behavior and knowledge. In urban areas of Bangladesh pedestrians represents often up to 70% of road accident fatalities. Current statistics revealed a deteriorating situation in Metropolitan Dhaka. For example, pedestrians as a proportion of road accident deaths increased from 43% in 1986-87 to 67% in 1991-92. In recent years (1996-98) the number of pedestrian casualties (fatalities and injuries) has increased markedly from 443 in 1996 to 588 in 1998, an increase of about 29%. Pedestrians are now making up approximately 63% of the total road accidents, 32% of injuries and are involved in

* **Corresponding author:** <krrporag@gmail.com>
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about 20% of all reported accidents. Indeed, with fatal accidents 70% was pedestrian – motorized vehicle collisions [Hoque (2002)].

Pedestrians make collisions with the non-motorized vehicles named as Rickshaw[†] and plunge in different small, medium and fatal injuries at the time of walking the roadsides because of poor pedestrian facilities in Dhaka city. Pedestrians are usually not able to use the footpaths due to many problems on the walkways like presence of illegal vendors, broken surface, placement of dustbins and some other structures and discontinuity of the walkway surfaces. Discontinuity of the walkway creates problem to the older and disabled persons who have to get on the walkway and get off within 15 to 20 feet distance interval in most of the cases. So these older and disabled persons also get hurt on their legs and they are frightened of using the footpath.

This study specifically tries to wrap up variation of pedestrian accidents in different parts of Dhaka city and also explore the level of awareness of the urbanites for using the footpaths and their knowledge of safety. Finally, the study tries to set some policy options for the city or transport authorities so that the accidents can be anticipated to some extent.

Materials and Methods

Simple statistical method has been used for arranging the data base here in this study. We conducted a questionnaire survey to the pedestrians. We used 1000 sample data and we conducted the survey during the January 2004. Questions were asked to the pedestrians during three different times as: a) morning peak hours (from 7 am to 9am), b) Off hours (Noon 12.00 to 14.00 o'clock) and c) Evening Peak hours (afternoon 17.00 to 19.00 o'clock). Five blocks have been selected for the survey operation in the study area. These five blocks have five characteristics like: residential area, shopping area, commercial business district, mixed use area and overall transit area. Observation survey has been taken place as well to know the existing situation of the safety issues of the walkways. Here, sidewalks have been also focused while conducting the field survey instead of focusing the cross walks only because the study tries exploring all the types of pedestrians' accidents. Secondary data have been collected from some research institutions. Survey has been also conducted to the clinics and police stations for getting information regarding the pedestrian accident matters. Unfortunately, the health centers or clinics and the police stations did not able to provide any organized data base as there is no police registration system if any pedestrian faces accident. After compiling the information from the field survey, this study shows the different types of accidents in Dhaka City and also the awareness of the urbanites in this regard.

Results

Typology of Pedestrian Crash in Dhaka city: Pedestrians face some unique problems at the time of using sidewalks and pedestrians' crossings. Pedestrians injure while walking the sidewalks of the different roads in Dhaka city by thrown materials of the construction sites because most of high rise building construction is going on along the pedestrian ways. There are also some accidents happen due to collision with vehicles (both motorized and non-motorized) at the time of crossing roads and walking on the roadsides. There is another unique type of pedestrian accident takes place during the flood or in the monsoon period when the roads and the sidewalks are inundated. At this time, people can not visualize the man-holes of the sewerage lines as they can not be seen in the rain/flood water and fall in the manholes and injure themselves. Sometimes, people get down in the sewerage line and serious injuries take place. On the 22nd of June' 2004, two brothers died due to fallen in the man-whole suddenly when they were walking through the

[†] Three wheeler human pulled vehicle.

sidewalks[‡]. By getting the information from the Dhaka City Corporation (DCC) authority, some surveyed clinics and from Police stations, nine major types of crash have been identified here in Dhaka City for the pedestrians. Those are as:

- a) Dart Out: Here, a pedestrian enters the street and either runs into or is hit by a moving vehicle. This type of accident happens mostly in the small roads.
- b) Walking along roadway: A pedestrian is walking along the edge of the road and is struck by a moving vehicle.
- c) Multiple threats: One or more vehicles have slowed or stopped, allowing the pedestrian to safely cross the first lane of a multilane street.
- d) Crossing in front of a turning vehicle: The driver is turning into and merging with traffic and the vehicle strikes the pedestrian who is generally walking in a direction that is different from the driver's focus of attention.
- e) Vendor Trucks: A vehicle strikes a pedestrian who is going to or from vending vehicle.
- f) Backing up: A vehicle that is backing up strikes a pedestrian who is crossing behind it. These occur mostly in the commercial or high density residential areas.
- g) Intersection dash: The pedestrian, who may be running or crossing at a marked intersection and moves in front of a vehicle that may not have time enough to stop all on a sudden, creates accidents.
- h) Crossing in front of Bus: Often the pedestrians try to cross the roads in front of a moving bus which is slowly speeding up, creates accidents.
- i) Waiting for Bus in the bus stops: In the transit areas, people are waiting for the bus on the carriage way and are injured by the buses. The buses are also trying to take more passengers and are rushing towards the stops and hurts the people who are waiting for the buses on the carriageway. This is also very common type of crash in Dhaka city.

There are some other types of crashes and they are crash or collisions with the rickshaws. But Pedestrians are not caring too much to those three wheeler human puller vehicles as they don't get much hurt from this type of collision. Beside, after this collision pedestrians do not even go to the clinics or to the doctors to take necessary treatment. For this instance, examples or data are required to enhance the above discussions but due to unavailability of database, the study would not able to present the different injuries. But the data from the survey can give portray of several types of pedestrian crashes in Dhaka City.

Table 1. Different types of pedestrian crashes in Dhaka city.

Crash type	Name of Blocks				
	Farmgate	New Market	CBD Area	Malibag	Mohakhali
Dart out	40%	30%	18%	15%	12%
Walking along roadway	14%	10%	14%	10%	10%
Multiple threat	12%	18%	20%	19%	11%
Vehicle turn	6%	7%	10%	6%	6%
Vendor truck	1%	5%	1%	1%	1%
Backing up	5%	8%	11%	10%	9%
Intersection Dash	4%	3%	5%	6%	5%
Crossing in front of bus	2%	3%	6%	7%	10%
Waiting for a bus	15%	14%	14%	23%	35%
Others	1%	2%	1%	1%	1%
Total	100	100	100	100	100

From the Table 1, it can be seen that dart out type crashes get a higher percentages in the Farmgate area. A lot of tutoring centers and different types of retail commercial businesses are operating here in this block and to enjoy these facilities for more time, people tend to save their time by always trying to cross the road directly without using the foot over bridges. On the other hand, huge gatherings to wait for the bus on the streets in the Mohakhali block which is a transit area for the regular commuters sometimes cause pedestrians accidents. Here, inter district and intra district buses are available for the commuters and a bus terminal is located in this block. People are

[‡] The Daily *Ajker Kagoj*, June 23rd, 2004, Dhaka, Bangladesh

waiting to take their desire bus on the streets and collision can be seen almost everyday in the intersection. The buses are not going with higher speed and the collisions are not major in most of the cases. In CBD area, multiple threat crash can be found in greater percentage than the other areas. Here the roads are a bit wider. For this, when people try to cross the roads through the carriage way, this crash takes place.

Pedestrian Accidents in Dhaka City: Most of the pedestrians in Dhaka city are facing small, medium and fatal accidents frequently. Most of the pedestrians face small or slight injuries while walking on the walkways. In the five different survey blocks, the study tries to explore the pedestrians' accidents on the last four weeks. Most of pedestrians faced very small or slight injuries and very little of the total pedestrians claimed major injuries during the last four weeks. 48% walkers responded that they had faced small injuries in last four weeks and most of them claimed that they injured due to collision with the rickshaws.

The following figure will show the different percentages in five blocks regarding the response of accidents of the pedestrians.

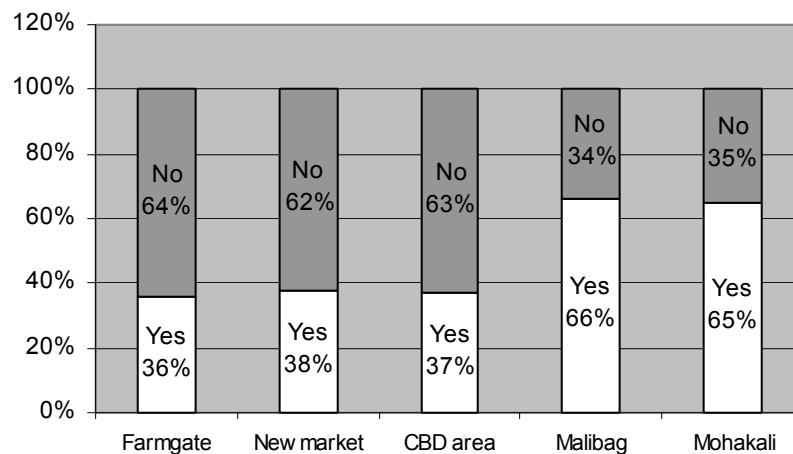


Fig. 1. Pedestrian's response to accident in the study area.

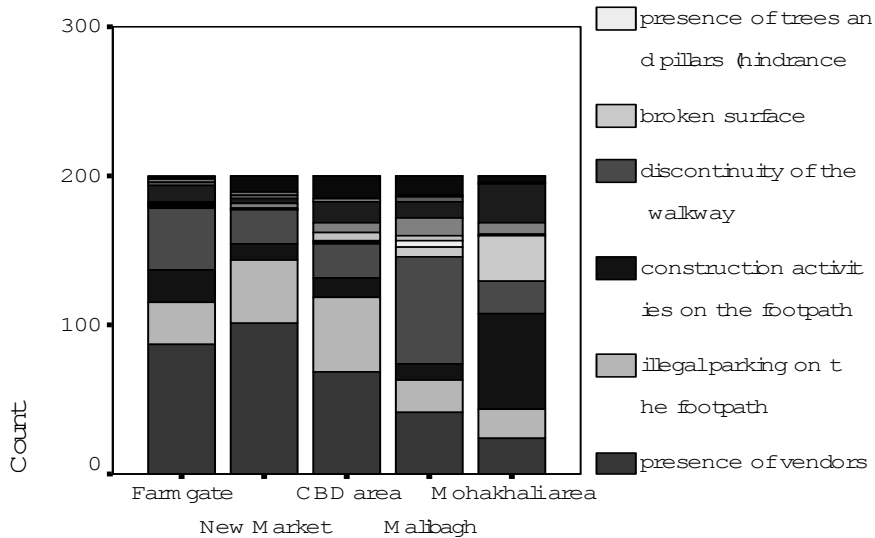
From the above figure, it can be observed that the pedestrians in the Mohakhali and Malibag area face more injuries in number than the other areas and about 66% and 65% pedestrians were wounded by different types of accidents. But the scenario is lower in CBD, Newmarket and Farmgate area. Since, in some portions of the CBD area, the walkways are well maintained than the other areas. For instance, people use the walkways in greater number in the CBD area and also in the Farmgate and Newmarket area. So, possibility of collision with the vehicles or with the rickshaws is lower in those areas. In the sample questionnaire, almost all the pedestrians claimed only some small injuries like getting pain on leg, or cutting some portions of the body. They don't even go to take the first aid treatment to the nearest clinics. Only the pedestrians who got hurt with some major injuries went to the clinics or to the doctors.

In the present study, we broadly classify three different types of accident injuries in Dhaka city as:

- a) Fatal injury: This is one of the forms of injury in which death occurs as a result of a road accident within 30 days of the accident.
- b) Serious Injury: This injury is one for which a person is detained in hospital as an in-patient, or sustains one or more of the following injuries irrespective of hospital detention – fractures, concussion, internal injuries, crushing, severe cuts, lacerations and severe general shock requiring medical treatment, and

c) Slight or small injury: This is one of a minor character such as a sprain, bruise, or a cut or laceration not judged to be severe.

Among the 1000 sample pedestrians, nobody claimed about serious or fatal injury. But 48% of the respondents claimed about slight injuries while using the walkways. Pedestrians claimed also many problems that encountered them for the slight injuries. The following figure will help understand the opinions of the walkers in Dhaka City related to safety issues in regard to small injuries.



Survey Back

Pedestrians claim some factors which force them to get slight injuries. Those are, presence of the trees or pillars on the walk way, broken surface, discontinuity of the walkway, construction activities (both on walkways and just beside the walkways), illegal; parking on the footpaths and presence of the vendors. In the night time, some walkways remain dark as there are no sufficient lighting opportunities. For instance, people can not see clearly the front side and often they collide with the trees or with the electric pillars that remain on the walkways. From the Fig. 2, it can be seen that in Mohakhali area some walkers responded this one as a problem for getting slight or small injury. Presence of vendors on the walkway does not offer enough space to the walkers and for this, pedestrians use the carriage way for the comfortable walk. This allows some pedestrians to face small injuries after collision with non-motorized or motorized vehicles. Illegal parking and construction works beside the footpaths force people not to use the walkways. As a result, the pedestrians walk through the road space and they face small injuries especially in the morning peak hours 7.30 am to 9.30 am. But these accidents would be reduced if pedestrians have the adequate knowledge of road safety.

Level of Awareness about Road Safety: Awareness of road safety is very poor in Bangladesh. The City corporation authorities and some other public authorities who are supposed to manage and maintain the walkways and roads but they have not adequate programs for making people aware about road safety. In some places, some signs and bill boards can be found for making aware people about some traffic laws and regulations. Most of the bill board or guidelines are confined for showing traffic rules and regulations for the motorized vehicles and to also locate the on street parking areas for motorized vehicles and non-motorized vehicles. Specifically for the pedestrians,

there is no such opportunity at all. Almost 100% respondents mention that they did not even take any traffic safety regulations in the school education or in the college education. However, some school going children learn it from their schools but this opportunity is only available in very few schools (especially in some private schools rather in the public schools). Although there are also some foot-over bridges in the busiest places in Dhaka City, but people always feel comfortable to cross the street without using the over bridges. While observing the foot-over bridges, it can be seen that vendors occupied the places illegally to sell their goods. For instance, people are not feeling comfortable to cross the road through climbing up and down in the presence of vendors. The women pedestrians also claimed that they did not find any law enforcement police to evict the illegal hawkers and this is why they also used the road space to cross it. Among the five different study blocks, in only three places the zebra crossing has been observed for pedestrian crossing. Besides, there are some signal-lights can be found for the walkers but almost 80% of them are not working properly and about 90% of the pedestrians are not obeying the signals indeed.

Maintenance Authority's Opinions': There are three main public authorities who are supposed to manage and maintain the roads of Dhaka City including the pedestrian ways. Those authorities are familiar as:

- a) Dhaka City Corporation (DCC): In the jurisdiction of City authority, this organization is supposed to maintain the road surface which includes the walkways as well. Although this authority has its own yearly budget for this purpose, but the officials inform that there is no special plan for the pedestrians only. They always include the maintenance and management costs of walkways in the road/street maintenance cost. For this, hardly allocation for the walkway's betterment could be found.
- b) RAJUK (Capital Development Authority): Rajuk is supposed to prepare the Detail Area Plan and Master Plan for its jurisdictional area. For the betterment of the transportation system in Dhaka city, Rajuk also provides transport plan for five years and it includes the street design and parking lot design and the street design sector includes walkway design. It never allows any specific planning guideline for the pedestrians only but it should be there.
- c) RHD (Roads and Highway Department): This authority is taking care of the engineering design of the streets and looking after the surface of the roads and walkways. The road surface is damaged by sudden and monsoon flood and this department along with DCC are the responsible for repairing the roads. But sometimes they take more time and pedestrians suffer a lot for their movement.

There is no financial and technical provision of the three organizations to prepare plan for the walkers only. For this, they don't even collect the accident information and have any accident registration cell in the busiest places. If they collect information, then it would be a great opportunity for them to make an integrated plan which includes the sidewalk and pedestrians' crossing facilities development and enhancement of the safety concerns.

Discussion

It has been found that the pedestrians are facing almost nine types of accidents in Dhaka city. Among the different types of accidents, dart out is one of the major types which the policy makers and planners must consider for further research and investigation. Figure 1 also shows that most of the pedestrians have faced at least an accident in last four weeks. For instance, road safety education can play an important role to make people more aware about pedestrians' right and safety programs. Maintenance authorities have no proper plans to address the problems of pedestrians but they should have responsibility to address the problem by monitoring the situation and developing the rules and regulations and facilities.

Recommendations

There are some specific recommendations to upgrade the present situation of the walkways in Dhaka city. They are as:

- A pedestrian plan or guideline should be prepared by the DCC, so that they can also allocate some budget in behind the development of the walkways.
- Adequate measure should be taken for maintenance of carriageway and sidewalks. Ditches, cracks and patches have a detrimental consequence on the speed, safety and convenience of vehicular and pedestrian traffic.
- All traffic signs and signals should be standardized and be displayed properly at appropriate locations and a number of signs and signals should be installed in all intersection.
- Medians should be constructed wherever feasible on arterials to regulate and control turning movements, enhance roadway capacity and provide refuge for pedestrians crossing the roads.
- Removal of objects obstructing sight distance.
- Upgrading of roads where the condition of access roads, local streets and alley is generally poor. This can be achieved by soil grading, surfacing and general rehabilitation of existing roads.
- A national campaign should be undertaken via newspapers television and public service spots to educate the public about the meaning of pedestrian indications. Drivers should also be educated to pedestrians needs.
- Pedestrian networks should be well connected to interfaces with the public transport system through pedestrian friendly routing and stops. Access ways should be short, safe and attractive.
- Pedestrian network capacity should be adequately considered at design and management stages of sidewalks arterial crossing, shopping precincts and access ways to main transport terminals and transit stations. Traffic management should improve pedestrian traffic by using such techniques as one way schemes, parking elimination (to allow for sidewalk widening), better signal timing and pedestrian environment streets.
- Strict traffic restraint measure should be wisely implemented and enforced in the CBD, shopping and leisure areas, residential areas, arterials, vicinity of schools and any designated pedestrian priority areas. Restraint measure should include control of speed limits through speed reducing street modifications and enforcement.
- Further research should be carried out to identify the main safety problems and the specific reasons behind the accident for the pedestrians to propose some long term and short term solutions.

Besides, the public authorities who are maintaining the road space and the walkways should work together and it requires proper coordination. Especially in Dhaka City, there is lack of cooperation in between different public organizations and no one knows properly about other organizations' ongoing projects. For this, coordination among the different authorities with same interest could allow better, barrier and accident free walking environment for the pedestrians.

Conclusion

There are compelling reasons for creating the conditions that will encourage people to walk more, as part of a 21st century transport pattern that is sustainable. As 52% trips in Dhaka are made by foot everyday, the transport planners and engineers must consider the pedestrian's need and to think about their safety issues. Pedestrians face small injuries quite frequently especially collision with non-motorized vehicles. For this, efforts from the public and private authorities can help minimizing the injuries by building awareness to the walkers in Dhaka city.

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