

ASSESSING BUS SERVICE QUALITY BASED ON PUBLIC PERCEPTION: A CASE STUDY IN CHITTAGONG CITY

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ABSTRACT

This paper proposes a methodology for evaluating the quality of service perceived by users of a bus transit service. Even though bus service plays crucial role for transportation of significant number of people in emerging cities, their services are frequently insufficient to meet demand. A quality service is necessary to retain the users and to attract new user for using public transport more, rather than the individual transport to reduce traffic congestion. The main aim of this paper is to assess the service quality (SQ) of bus in Chittagong city based on public perception. Achieving the research objective, a questionnaire survey was conducted on 12 major locations of Chittagong City. 715 regular city bus users of different profession participated in the survey in June, 2017. The result shows that about half of the users in Chittagong city rated overall bus service quality as poor. The respondents evaluated the bus service quality attributes for example convenience, frequency, punctuality, fitness, reliability, waiting time, seat conditions, noise level, personal safety, cleanliness and travel time during office days as poor while movement flexibility inside the bus, courtesy of helpers/conductors, behavior of driver, level of personal safety inside the bus were ranked very poor. However the respondents perceive that speed of bus, availability of information of bus, transport cost, lighting facility and travel time during holidays are satisfactory. The findings of this study offer significant comprehensions for enhancing the bus service presently being offered and the aspects on which the greater attention may be provided.

Keywords: Chittagong city, Bus Service Quality, Users' Perception

1. INTRODUCTION

Bus service performs a significant function for movement of considerable number of people in developing cities where the mobility needs are increasing due to rapid urbanization. Even though bus service plays crucial role for transportation of significant number of people in emerging cities, their services are frequently insufficient to meet demand. Usually the services provided by the buses are insufficient (Ali, 2010). Users' are accommodated to meet up their mobility needs by public buses with associated challenges in delay and discomposure (Davidson and Knowles, 2006) leading to dissatisfaction (Aidoo et al, 2013).

Chittagong is the second largest metropolis and Chief port of Bangladesh, with density of 47,500 people per square mile (Demographia, 2017). Although other modes of transportation like railway and waterway exist in this metro city, they are not suitable for the internal transportations. Hence, the roadway is the most operational transportation system in Chittagong city like other overcrowded cities in the world. The majority of trips in Chittagong are served by public transport since a significant numbers of people can't afford personal vehicle. As the fare of non-motorized transport (NMT) or other para-transits are more expensive than the bus fares (Rahman, 2009), most of the people are heavily dependent on public transport for their travel (Hossain 2006). However, non-motorized transport (NMT) or

other para-transits users may use the bus or other mass transportation services if it provides safe and adequate facility to the passengers.

Public transport system of Chittagong city necessitates significant improvement of service quality, which can be accomplished by a comprehensive understanding of travel behavior and its user needs and expectations for explaining the factors affecting bus service quality which can help policymakers to implement targeted improvement strategies. The research explores the overall situation of bus service; particularly the major problems the passengers are facing, based on their experience on existing service quality. The main aim of this work is to assess the service quality (SQ) of bus in Chittagong city based on public perception.

2. LITERATURE REVIEW

Passenger satisfaction in transport perspective may result by the judgment of expectations previous to travel and experience followed by the travel. Satisfaction is accomplished if a feeling of contentment results comparing users experience to their expectation. The expected service quality can be achieved by giving priority to the most important variables those affect the users to make a decision about to use or not to use the public transport service. Service quality (SQ) is perceived as an important determinant of users' demand (Prioni & Hensher, 2000) to identify importance of service quality for users' satisfaction. According to Parasuraman et al, (1988) the feeling of satisfaction may depend on several factors like service quality, product quality, price, status and individual attributes.

Service quality is a measure of how well the service level that is delivered matches customer expectations, while a firm delivering quality service means conforming to customer expectations on a consistent basis (Joewono and Kubota, 2007; Transportation Research Board, 1999, 2004; Lai and Chen, 2010). Service quality is an abstract concept that is hard to be defined, and in practice, often used interchangeably with satisfaction (Lai and Chen, 2010; Sumaedi et al. 2011).

Oliver (1997) explains that service quality is more specific and related to cognitive judgments while satisfaction is more holistic and associated with effective judgments. Furthermore, other researchers (Parasuraman et al. 1994; Zeithaml and Bitner, 1996;) stated that satisfaction judgments include many factors, i.e. product quality, price, situation and personal attributes, not to mention service quality.

Several researches have shown that reliability (arrival of bus on time) is an influential factor (Hensher et al. 2003; Disney 1999) whereas convenience and comfort such as cleanliness of bus service, availability of seat, physical condition, light, fan, seat condition are well known arguments (Anable, 2005). Other important and major aspect is safety (Eboli & Mazzulla 2007; Fellesson & Friman 2008; Eboli & Mazzulla 2012). Tyrinopoulos & Antoniou (2008) indicated that the key satisfaction indicators were the service frequency, transfer distance, ticketing system, and vehicle cleanliness. (Rohani et al. 2013) suggested that bus service reliability, safety, comfort and cleanliness are the major factors for bus service in Dhaka. Rahman and Nahrin (2012) found that most of the respondents are satisfied with the cost of ticket but very unsatisfied with the waiting time as they have to wait for the bus sometimes about an hour. Mannan & Karim (2001) stated that long waiting time, delay on regular schedule, overloading, discomfort, long walking distance from the residence and work place to bus stop and struggle for acquiring seats are some of the obvious problems faced by the users in their daily life. According to Alam et al., (2012), cheapest mode available as mass transit, are constrained by poor service conditions: long waiting, delay on plying, overloading and long walking distance from the residence/work place to bus stoppage. Hossain et al. (2012) pointed out that the excessive travel time, waiting time and dreadful services in terms

of comfort, regularity and on-time performance hindered the prospect of the public bus service of Dhaka city.

Regarding the safety and security condition, main three reasons of dissatisfaction of passengers' are unsafe driving practices, poor boarding and alighting facilities and lack of law enforcing agencies surveillance, that reason the service make unsatisfactory including irregular service provided by buses, regular overcrowding, lack of good standard buses and lack of cleanliness. In spite of these negative views, users' possessed a positive attitude for buses which is the low travel cost (Rahman et. al. 2017).

3. METHODOLOGY

A comprehensive questionnaire survey was carried out face to face at 12 locations of major bus stands in Chittagong city. The survey was conducted in June 2017 at Agrabad, Nasirbad, Khulshi, G.E.C. Circle, New Market, Andarkilla, 2 No. Gate, Halishohor, Gosaildanga, Jamal khan, Cheragi hill and Bohaddar hat in Chittagong city. The survey was accomplished between 09:00 am to 05:00 pm during morning and evening peak periods. The questionnaire had a total 40 questions including seven main parts regarding "Trip characteristics", "Quality of service", "Quality of bus", "Safety and security of bus", "Quality of bus stop", "Courtesy of Helpers/Conductors" and "Reliability and accessibility of bus". The passengers were asked to rate their perception on these service components on a five point likert scale ranging from 1 to 5 (1 is for 'excellent' and 5 is for 'very poor'). Total 715 samples were interviewed by seven enumerators. Table 1 shows general information of respondents.

Table 1 General information of Respondents

Features	Statistics
Gender	Male (71%), Female (29%)
Age	10~19 Years old (13%), 20~29 Years old (48%), 30~39 Years old (25%), 40~49 Years old (10%), 50~60 Years old (3%), >60 Years old (1%)
Occupation	Student (45%), Private Service (24%), Public Service (12%), House Wife (6%), Labor (4%), Businessman (9%)
Monthly income	<10000 Tk. (31%), 10000~30000 Tk. (45%), 30000~50000 Tk. (16%), 50000~70000 Tk. (7%), >100000 Tk. (1%)
Cars ownership	Did not any car (87%), A unit (11%), Two units (2%), Three units or more (0%)
Motorcycles ownership	Did not own any m-cycle (71%), A unit (23%), Two units (6%), Three units or more (0%)
Main mode of travel	Bus (86%), Rickshaw (2%), Para transit (2%), Motorcycle (7%), Car (3%)
Monthly travel expenditure	1%-10%Travel cost (38%), 11%-20% Travel cost (47%), 21%-30% Travel cost (13%), >30 Travel cost (2%)
Trip purpose	School/College/Polytechnic/University (45%), Office/Business (39%), Emergency/Hospital (3%), Park/Zoo/Museum (1%), Other (12%)
Reason of using bus	Low cost (63%), No own transport (20%), No other option (9%), Safety (6%), Fast travel (2%)
Users take mode to get bus stop	By waking (62%), Rickshaw (27%), Para transit (8%), Motorcycle/Cycle (2%), CNG (2%)
User time for reach bus stop	5 min (25%), 10 min (43%), 15 min (20%), 20 min (9%), 25 min (4%)

Data Analysis and Results

According to the survey report maximum (75%) respondents' answered they travel by local bus every day while 14% replied they travel more than twice a week but not every day.

Figure 1 shows users' frequency of travel by local bus. Figure 2 shows that about half of the respondents (51%) answered that the convenience of service of bus is poor while 28% answered satisfactory and 15% answered very poor. 6% of the users consider the convenience of service is good.

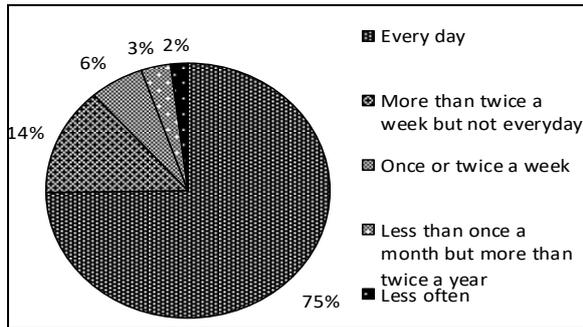


Figure 1: Frequency of travel by local bus

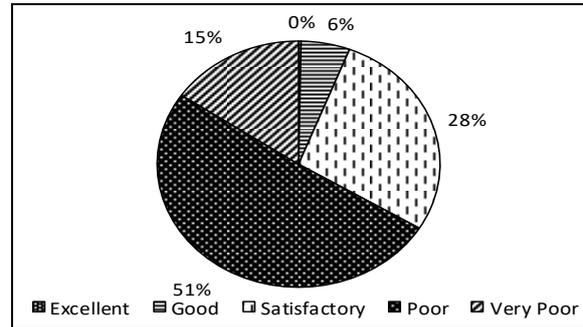


Figure 2: Convenience of Service

About half (51%) of the respondents' answered the frequency of the bus service is poor while 36% answered satisfactory. 10%, 2% and 1% answered good, very poor and excellent respectively as shows in Figure 3. Result shows that more than half (55%) of the responded replied the punctuality of service is poor while 22% responded satisfactory and 19% replied very poor as shown in Figure 4.

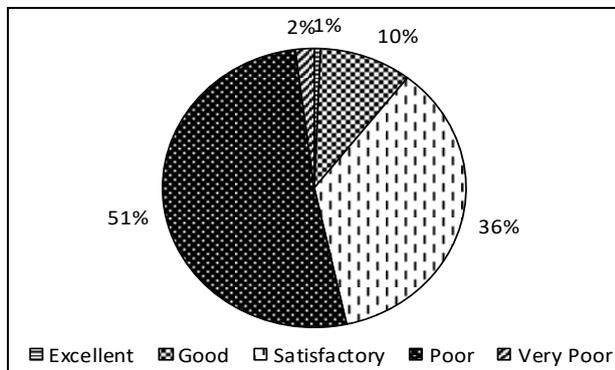


Figure 3: Frequency of bus service

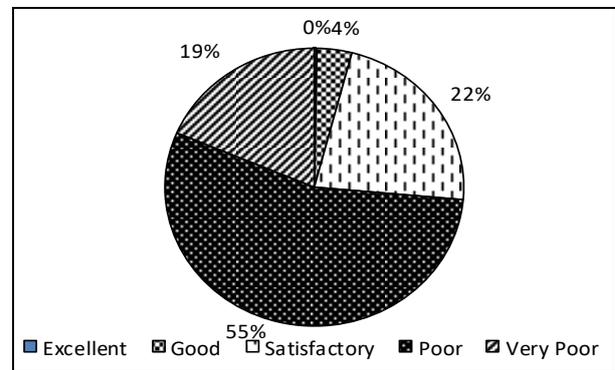


Figure 4: Punctuality of transport

Result shows that 49% of the respondents answered the movement flexibility on road is poor while 22% and 28% answered satisfactory and very poor respectively as shows in Figure 5. Figure 6 shows the sitting arrangements inside the bus for men and women. 42% of the respondents rated it as poor and 41% replied very poor. 15% of the responded consider the sitting arrangement as satisfactory.

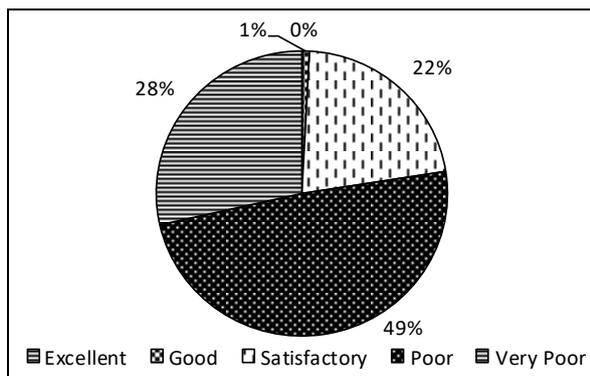


Figure 5: Movement flexibility (On Road)

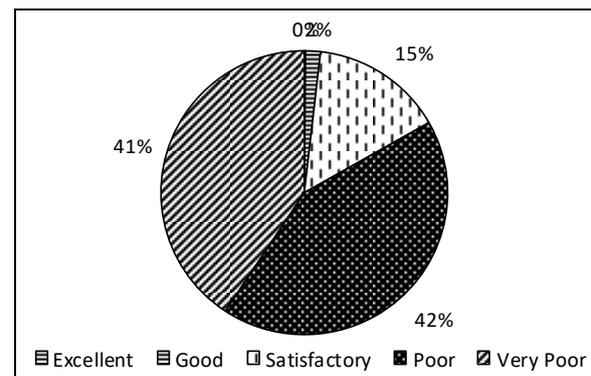


Figure 6: Sitting Arrangements

About 38% respondents assessed the speed of the bus as satisfactory while 30% and 23% evaluated as poor and very poor as described in Figure 7. Nobody rated the speed of bus as excellent. About 36% respondents rated the availability of information of bus service as satisfactory while 31% ranked poor as shows in Figure 8.

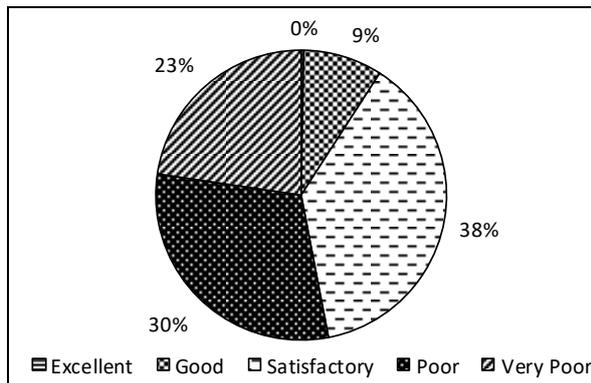


Figure 7: Speed of bus

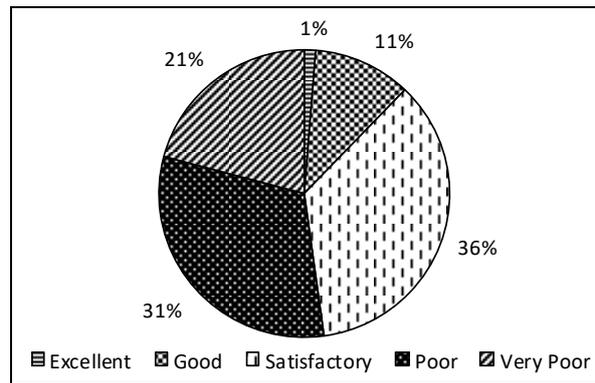


Figure 8: Availability of information of bus

40%, 30% and 19% of the respondents rated the ticketing system poor, satisfactory and very poor respectively as shows in Figure 9. Figure 10 shows that in Chittagong city majority (55%) of the respondents perceive the transport cost as satisfactory while 18% respondents think it as poor.

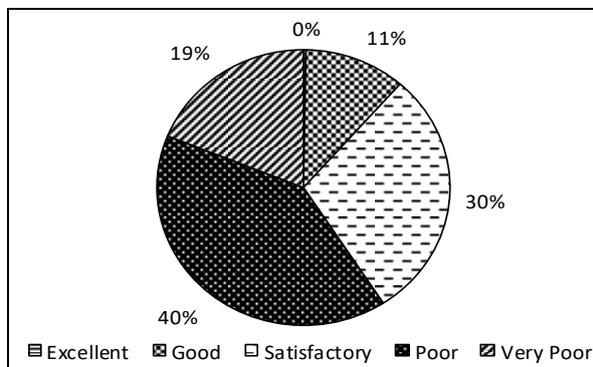


Figure 9: Paying fare/Ticketing system

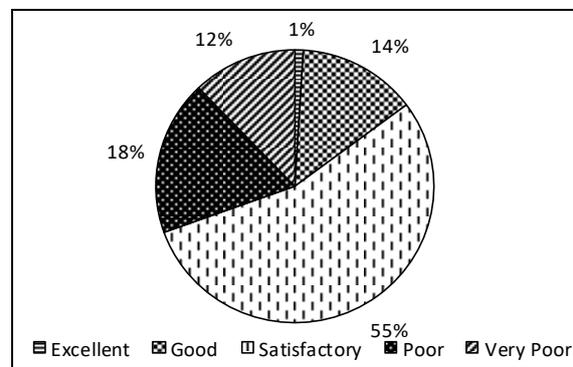


Figure 10: Transport cost

About half (49%) of the respondents expressed that the overall fitness of bus is poor while 29% said very poor and 20% said satisfactory as shown in Figure 11. As illustrated in Figure 12, majority of the respondents (55%) said that the seat condition of bus is poor 37% revealed it as very poor. said by (55%) and 37% respondents respectively.

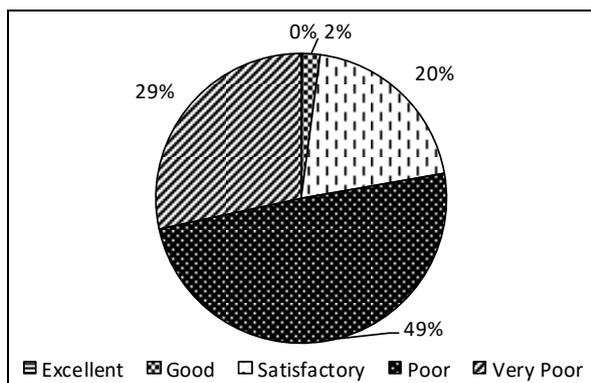


Figure 11: Fitness of bus

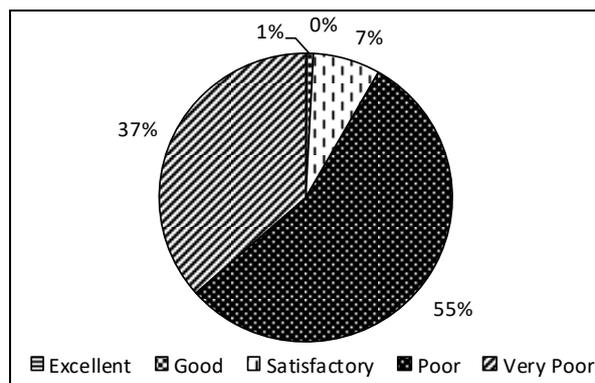


Figure 12: Seat condition

Figure 13 shows that about half of the users' (51%) answered that the cleanliness of bus is poor while 30% and 17% replied very poor and satisfactory respectively. About 55% users strongly agree that the bus is always over crowded as shown in Figure 14.

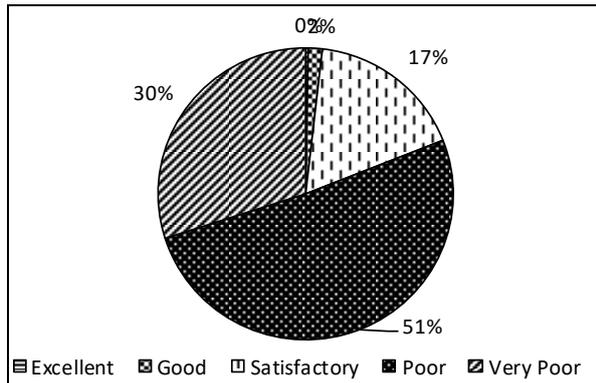


Figure 13: Cleanliness of bus

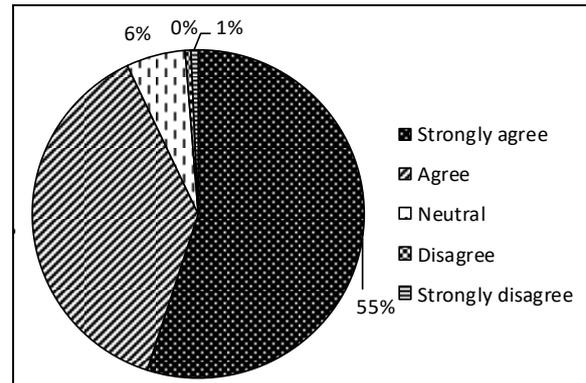


Figure 14: Overcrowding

Figure 15 shows the lighting facility of bus services. According to the survey report maximum (43%) respondents perceive that the lighting facility is satisfactory while 39% answered poor. Figure 16 shows maximum (54%) respondents rated the noise level of the bus as poor.

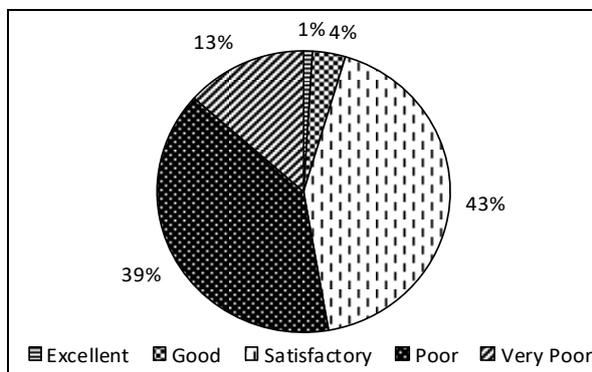


Figure 15: Lighting facility

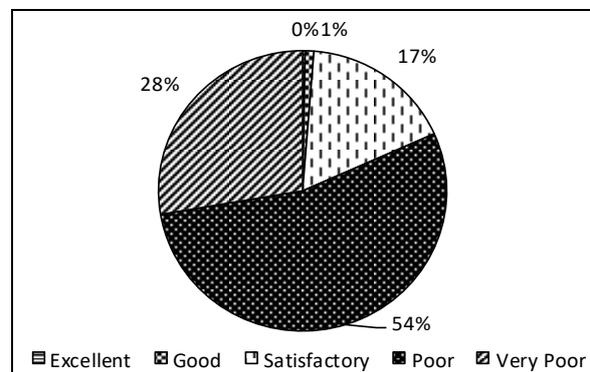


Figure 16: Noise level of the Bus

Figure 17 illustrates that about half of the respondents (51%) perceive that the movement flexibility inside the bus is very poor and 41% think poor. Figure 18 shows that respondents' opinion about the comfort level of bus service ranges from poor (49%) to very poor (42%).

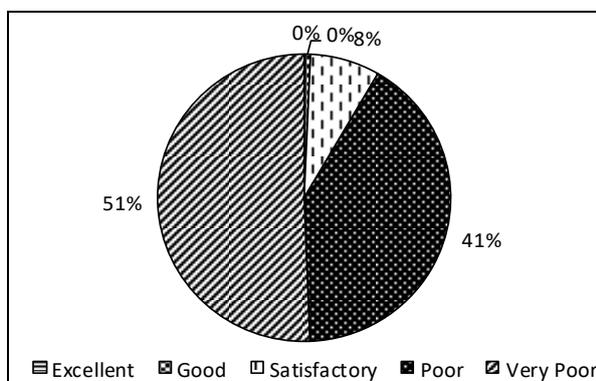


Figure 17: Movement flexibility (Inside)

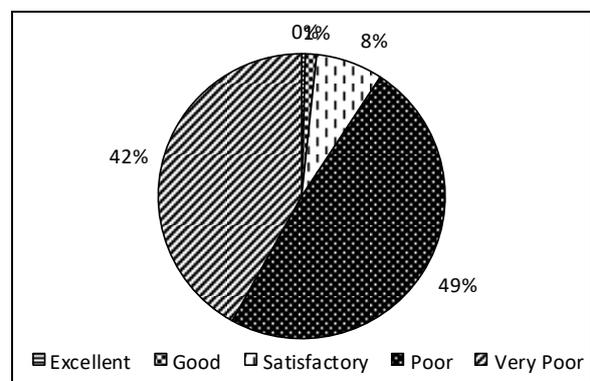


Figure 18: Comfort level

Most of the respondents (62%) assessed the physical condition of bus as poor while 14% and 24% answered satisfactory and very poor respectively as described in Figure 19. Respondents were asked to rate the quality of bus services. About half (53%) of the

respondents' rated the service quality as poor while 20% ranked as satisfactory. 24% of them thinks that the service quality is very poor as shown in Figure 20.

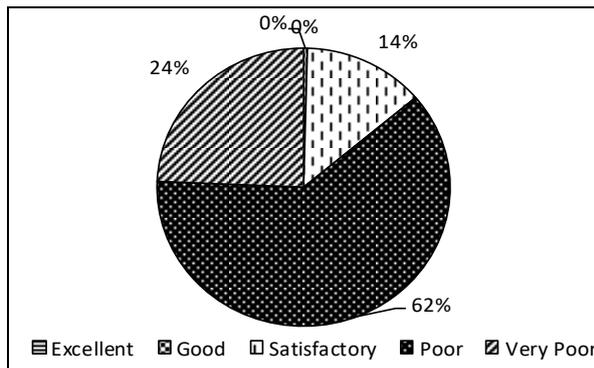


Figure 19: Physical condition

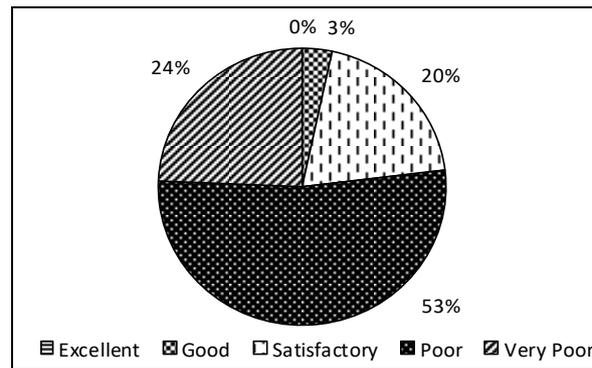


Figure 20: Quality of bus services

Figure 21 shows that 52% of the respondents' ranked the cleanliness of bus stop as poor while 33% and 14% rated very poor and satisfactory respectively. About half (52) of the respondents' replied that the condition of bus stop is poor as shown in Figure 22.

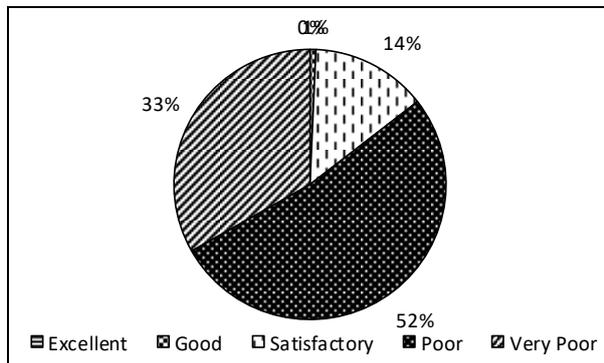


Figure 21: Cleanliness of bus stop

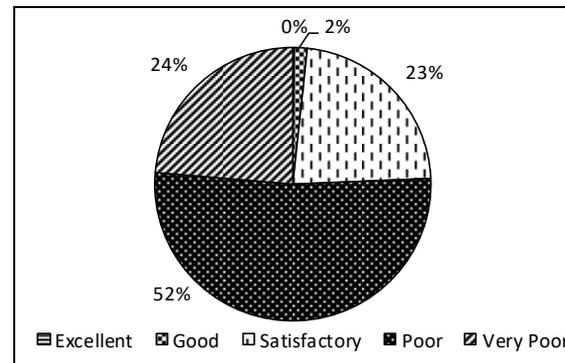


Figure 22: Condition of bus stop

Figure 23 shows users' perception about ease of entry and exit facilities of bus. Majority (55%) of the respondents rated it as poor while 36% replied very poor. Figure 24 shows that about half (50%) of the users in Chittagong city perceive the courtesy of helpers/conductors is very poor.

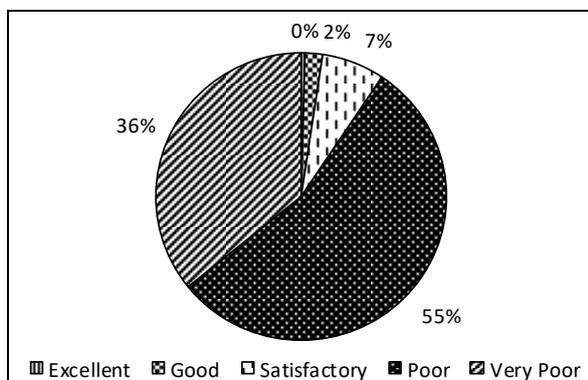


Figure 23: Entry and Exit

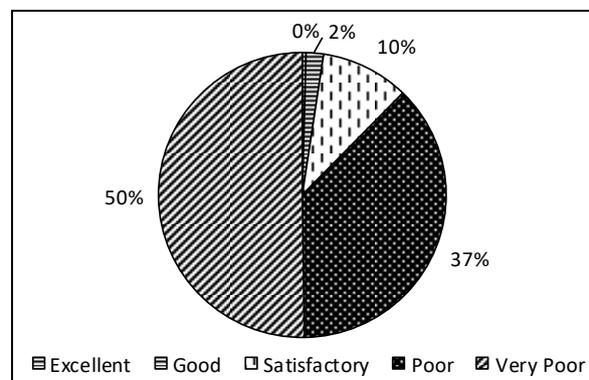


Figure 24: Courtesy of Helpers/Conductors

Figure 25 shows that majority (35%) of the respondents replied that the behavior of drivers is very poor while 31% and 29% replied fairly poor and neither good nor poor respectively. About (38%) of respondents mentioned that the driver skill is poor while 29% mentioned both very poor and satisfactory as shown in Figure 26.

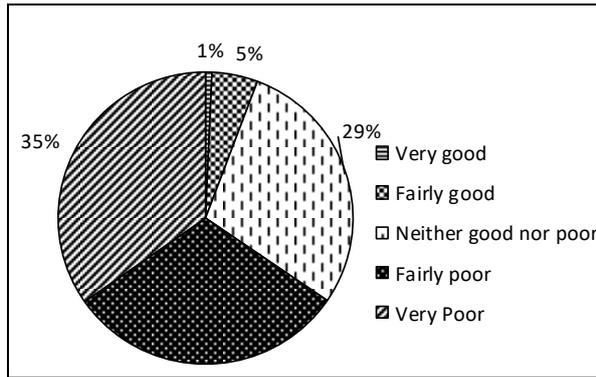


Figure 25: Behavior of driver

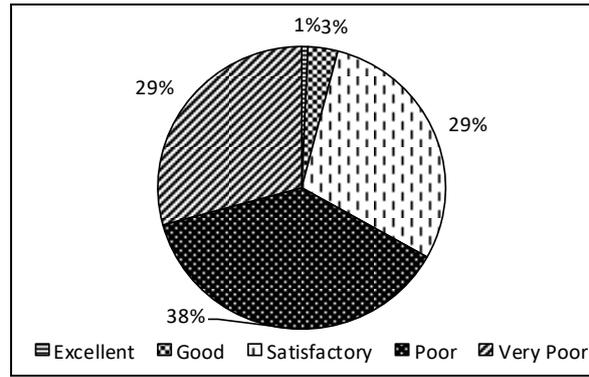


Figure 26: driving safety (Drivers Skill)

Majority of the respondents perceived that the accessibility of bus stop (48%) as well as accessibility of bus (49%) is poor as mentioned in Figure 27 and Figure 28.

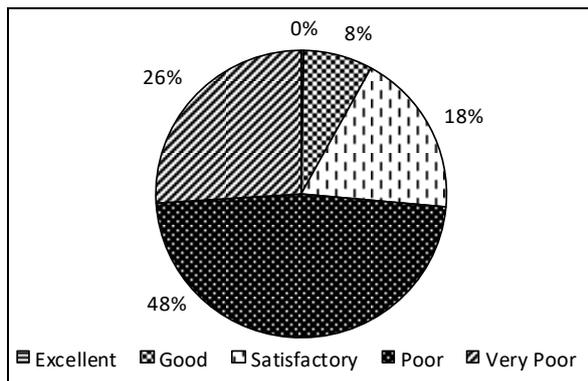


Figure 27: Accessibility of bus stop

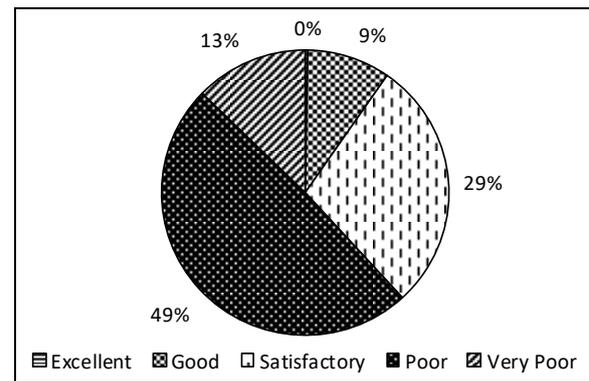


Figure 28: Accessibility of bus

About 42% respondents answered that the waiting time for the bus service is 10 to 15 minutes while 39% answered 5 to 10 minutes and 13% answered 15 to 20 minutes as shown in table 2. Table 2 shows that majority (31%) of the users rated the reliability of bus service neither good nor poor while 26%, 20%, 19% respondents replied fairly poor, very poor and fairly good respectively.

Table 2: Users' perception about waiting time and reliability of local bus services

Waiting time for the service	Percentages	Reliability of local bus services	Percentages
5 min-10 min	39%	Very good	3%
10 min – 15 min	42%	Fairly good	19%
15 min-20 min	13%	Neither good nor poor	31%
20 min-25 min	3%	Fairly poor	26%
25 min-30 min	2%	Very Poor	20%

48% of the respondents replied that the travel time of bus service during office days is poor (shown in Figure 29) while 38% rated it as satisfactory during holidays (shown in Figure 30). On the other hand 37% and 17% of the users think the travel time of bus service during office day and holidays is excellent.

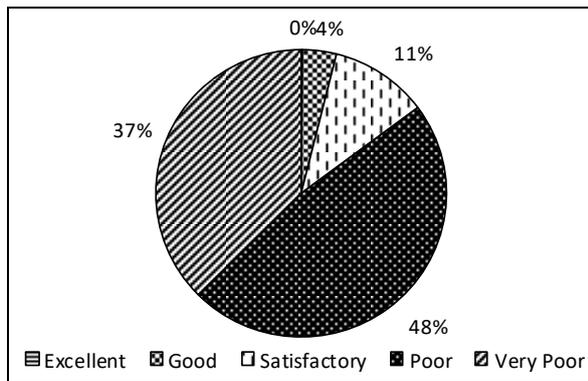


Figure 29: Travel time (office days)

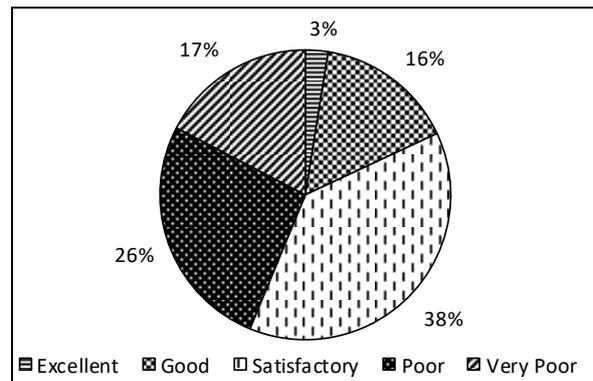


Figure 30: Travel Time (holidays)

Majority of the respondents perceive that the safety at bus stop (43%), security at bus stop (47%), level of personal security inside the bus (35%) and security of passengers in off peak period (58%) is poor as shows in table 3.

Table 3: Safety and security at bus and bus stop

Rating Scale	Safety at bus stop	Security at bus stop	Level of personal safety inside the bus	Security of passengers in off peak period
Excellent	0%	0%	0%	0%
Good	3%	2%	5%	2%
Satisfactory	18%	22%	25%	10%
Poor	43%	47%	35%	58%
Very poor	36%	29%	35%	29%

4. CONCLUSIONS

This study evaluated passengers satisfaction level of various service aspects provided by public transport in Chittagong city. About 86% of the respondents of Chittagong city stated that bus is their main mode of transport. 63% of them indicated the reason of using bus is its low cost. Result indicates that 75% of the respondents travel by local bus every day. About half of the respondents of Chittagong city rated the service quality features for example convenience of service, frequency of bus service, punctuality of transport, seat condition, cleanliness of bus, noise level of bus, physical condition of bus, cleanliness of bus stop, condition of bus stop, entry and exit facilities of bus, security of passengers (off peak period), movement flexibility of bus on the road, sitting arrangements, paying fare/ticketing system, fitness of bus, comfort level, driving skills, accessibility of bus, accessibility of bus stop, travel time during office days, safety at bus stop, security at bus stop, level of personal safety in the bus as poor. Movement flexibility inside the bus, courtesy of helpers/conductors, behavior of driver, and level of personal safety inside the bus were rated very poor. However the respondents rated the following service quality attributes as speed of bus, availability information of bus, transport cost, lighting facility, travel time during holidays as satisfactory. Finally about 53% of the bus users' ranked the overall bus service quality as poor. Majority of the passengers are not satisfied with the service provided by the public bus transport though bus is the main mode of transport in Chittagong city.

The findings of this study offer significant comprehensions for enhancing the bus service presently being offered and the aspects on which the greater attention may be provided. Although findings of this research offers prompting direction in evaluating service quality of bus, some limitations is also acknowledged. The sample had a gender bias. This could be due to the fact that female were less enthusiastic in answering the questionnaire. Further

variation in samples as adding more survey locations may help to obtain more accurate conclusion of bus service quality.

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