Research article

Assessing the visitors' attitude and the zoo animals' behavior from Chattogram Zoo: A Bangladesh perspective

Mohammad Yusuf Munna[1], Md Ridoan Pasha[1], Md. Shahadat Hossain Shuvo[2], Mohammad Mahmudul Hassan[1], Arfanul Alam Simon[1], Shahneaz Ali Khan[1] and Mohammad Rashedul Alam[1]*

[1]Department of Physiology, Biochemistry and Pharmacology, Faculty of Veterinary Medicine, Chattogram Veterinary and Animal Sciences University, Chattogram, Bangladesh - 4225.
[2]Chattogram Zoo, Chattogram, Bangladesh

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ABSTRACT

Zoos have become a popular biological facility to generate knowledge, skills, and expertise in conservation research and education, globally. However, the visitor's attitude and behavior can affect the zoo animal's behavior and welfare, as this issue has not attained due attention in Bangladesh. This study was conducted to understand the visitors' behavior and its impact on three captive species; the Bengal Tiger, Spotted Deer, and Rhesus Monkey at Chattogram Zoo. In terms of the visitors' interests, female and young visitors showed more interest in the animals; especially towards the deer and monkeys. Female visitors showed more desirable behavior to the animals than their male counterparts. Female and young visitors approached the cages more than the male and adult visitors. On the other hand, in all three studies animals, especially the tigers, showed positive behavior toward female visitors. Monkeys were more excited and curious than other animals toward the female visitors whereas the tigers showed dull behavior toward the male visitors. The illiterate visitors showed more interest in the monkey and deer cage and were happier than other classes of visitors after visiting the zoo. Tigers showed activeness and alertness to the adult and illiterate visitors. However, the most undesirable behavior toward animals was also shown by the illiterate class of visitors. These findings on visitors' attitudes towards different zoo animals and the counter-reaction shown by animals will allow the national policymakers through their legislative guidelines towards common people to rethink what changes should be brought for a positive zoo environment.

1.INTRODUCTION

Wildlife collections primarily serve public exhibition, education, scientific and conservation purposes in captive conditions, which appear in different settings such as zoological gardens, biological parks, safari parks, public aquariums, bird parks, reptile parks, and insectariums, which are called zoos.

The number of visitors and their density, size, and behavior at zoo exhibits are uncontrolled variables to captive animals' behavioral and physiological changes (Davey, 2006). Different species show a variety of behaviors to people they don't know (Claxton, 2011), while others do not show any abnormal or unusual behaviors (Hosey, 2008). Therefore, it is critical to understand the impact of a visitor's presence on

zoo animals, whether positive, negative, or neutral (Das Gupta et al., 2017). The first studies to understand the relationship between visitors and zoo animals discovered that zoo visitors did affect the behaviors of captive animals to a greater degree than was previously anticipated (Davey, 2007).

Animal welfare is a very significant issue for captive animals that are kept in zoos. Keeping animals alive has been a major challenge for most zoos over the centuries at a time. However, concern about the welfare of such captive animals surprisingly has increased in the last decades (Mellor et al., 2015). In that connection, the behavior and attitudes of visitors exhibited towards the animal are of utmost importance to ensure proper welfare. However, the behavior of the visitors can be provocative and undesirable to the animals which may cause unnecessary stress (Sherwen et al., 2014; Das Gupta et al., 2017).

Bangladesh is a country in the part of the world where population growth and environmental degradation is a foreseeable phenomenon. Unfortunately, assessing the visitors' impact on zoo animal behavior and welfare in Bangladesh's perspective has been long ignored. Chattogram Zoo is an important recreational area not only for city dwellers but also for visitors from different parts of Bangladesh. As the zoo area is not so spacious, the pressure of visitors is increasing day by day and there is an urgent need to assess the visitors' impact on zoo animals. In this study, we assessed the visitor's attitude toward zoo animal behavior and to the extent which zoo animal welfare might be influenced by visitors' behavior.

2.MATERIALS AND METHODS

Area description and species studied

The Chattogram Zoo is one of Bangladesh's largest zoos, which is very popular due to its location. The data on which this study is based was collected using a questionnaire between January 2020 to December 2021 at Chattogram Zoo, to assess the visitor's attitude and the impact on zoo animals' behavior, primarily the Bengal Tiger (*Panthera tigristigris*), Spotted deer (*Axis axis*) and Rhesus Macaque (*Macaca mulatta*). A formal letter was sent to the curator of Chattogram Zoo for permission before

starting data collection for this study. The required information and data were collected through personal visits to the zoo. Those who agreed to take part in the survey were asked to complete the questionnaire as an individual even if they visited the zoos as part of a group; more than one member of each group was allowed to complete the survey.

Demographic information from visitors

Demographic information such as the visitor's name, education, occupation, purpose of visit, type of visit, and frequency of visit was asked from each of the targeted visitors. The interviewer was sitting in front of the exit point of the zoo and collected data before the visitor left the zoo.

Observation schedule

Observations (started from 1^{st}January 2019 to 1st January 2020) were scheduled so that the data for each visitor and exhibit would have equal representation across all times of the day, 7 days per week. The observation data were collected by visual observation of the behavior of animals and the visitors by the close observation by the enumerator. The tiger, spotted deer and rhesus monkey exhibits were very crowded, and targeted visitors were observed during visiting the selected three species. The visitors' behaviors as well as the response of the animals to the visitors' behavior were observed for eight hours; between the time the zoo opened in the morning i.e. 9.00 am, to the time they closed i.e. 5 pm. For each targeted visitor we allowed 30 minutes to observe the various behaviors exhibited by the 3 species, in response to the visitor's behavior.

Behavioral ethogram and observation of behaviors

The behavior of visitors was recorded on a record sheet as well as how much time they spent in front of the cage of the selected species. When a visitor gave his consent to give his or her information, the attitude of that certain visitor was observed. A behavioral ethogram was followed to guide the investigation of visitor's behaviors. Different behavioral expressions of animals on that visitor's behaviors were also observed at that certain period of time.

Statistical analysis

All data collected for this research was entered into the Microsoft Excel-2013 sheet. Descriptive statistics for different variables were analyzed using STATA-13. Different factors were compared based on the outcome using a chi-square test and fisher exact test where a P value<0.5 was considered significant.

3. RESULTS

Demographic characteristics of zoo visitors

Table 1illustrates the demographic characteristics of zoo visitors in this study. It was found that the adult (20-35 years) male (67%; n=134) population was the major (75%) visiting group. In terms of the purpose of the zoo visit, the maximum number of visitors (62.5%, n=125) came to this facility for recreation (Table 1). However, most of the visitors visited the zoo with their family (37.5%, n=75) and friends (27.5%, n=55). In the frequency of visiting zoo distribution, it was demonstrated that the largest number of visitors (62%, n=124) came to visit the zoo for the first time.

Visitor's attitude toward Tiger, Deer and Monkey

Overall, females were more interested in visiting the animal cages than their male counterparts (Table 2). The percentage of interest of females in visiting different cages was 96.97% (n= 64) for monkeys, 92.42% (n= 61) for tigers, and 89.39% (n= 59) for deer. From the age group perspective, teenagers (12 -19 years) and adults (20 – 35 years) had shown a more positive attitude to visiting the animal cages than the older age group (35+ years). In the case of having a positive attitude toward the tiger's cage, the percentage was higher among teenagers (91.89%, n= 34) followed by adults (89.40%, n= 135). Maximum 90.73% (n=137) adults were interested to visit the deer whereas most teenagers (94.59%, n=35) showed interest to visit the monkey cage. In terms of institutional education, interestingly all illiterate (100%, n=7) visitors showed their interest to visit the deer and monkey cages. Out of the three species, literate visitors showed the highest interest (94.85%, n=92) towards the monkey's cage. In the profession category, most of the housewives (96%, n=24) were inclined towards the tiger's cage.

Table 1. Demographic characteristics of zoo visitors

Demographic factor	Co-variable	n	%
Age	Teenage (12-19)	37	18.5
	Adult (20-35)	151	75.5
	Aged (35+)	12	6
Sex	Male	134	67
	Female	66	33
Education	Illiterate	7	3.5
	Literate	97	48.5
Purpose of visit	Recreation	125	62.5
	Hobby	13	6.5
	To get relaxed	11	5.5
	To introduce their kids to wild animals	51	25.5
Type of visit	Couple	35	17.5
	Friend circle	55	27.5
	In group	25	12.5
	Office colleague	1	0.5
	Single	9	4.5
	Whole family	75	37.5
Frequency of visit	First time in Zoo	124	62
	Yearly	76	38

Table 2. Visitor's attitude toward tiger, deer and monkey cages

Variable (N=200)	Category	Tiger				Deer				Monkey			
		Interested n (%)	Not interested n (%)	Indifferent n (%)	P value	Interested n (%)	Not interested n (%)	Indifferent n (%)	P value	Interested n (%)	Not interested) n (%)	Indifferent n (%)	P value
Sex	Male	115 (85.82)	10 (7.46)	9 (6.72)	0.365	121 (90.30)	10 (7.46)	3 (2.24)	0.634	123 (91.79)	7 (5.22)	4 (2.99)	0.362
	Female	61 (92.42)	2 (3.03)	3 (4.55)		59 (89.39)	4 (6.06)	3 (4.55)		64 (96.97)	1 (1.52)	1 (1.52)	
Age	Teenage (12-19)	34 (91.89)	2 (5.41)	1 (2.70)	0.019	33 (89.19)	3 (8.11)	1 (2.70)	0.843	35 (94.59)	0 (0.00)	2 (5.41)	0.418
	Adult (20-35)	135 (89.40)	8 (5.30)	8 (5.30)		137 (90.73)	10 (6.62)	4 (2.65)		141 (93.38)	7 (4.64)	3 (1.99)	
	Aged (35+)	7 (58.33)	2 (16.67)	3 (25.00)		10 (83.33)	1 (8.33)	1 (8.33)		11 (91.67)	1 (8.33)	0 (0.00)	
Education	Illiterate	3 (42.86)	1 (14.29)	3 (42.86)	0.001	7 (100.00)	0 (0.00)	0 (0.00)	0.604	7 (100.00)	0 (0.00)	0 (0.00)	0.859
	Literate	88 (90.72)	5 (5.15)	4 (4.12)		88 (90.72)	5 (5.15)	4 (4.12)		92 (94.85)	3 (3.09)	2 (2.06)	
	Higher study	85 (88.54)	6 (6.25)	5 (5.21)		85 (88.54)	9 (9.38)	2 (2.08)		88 (91.67)	5 (5.21)	3 (3.13)	
Occupation	Business	17 (77.27)	1 (4.55)	4 (18.18)	0.067	19 (86.36)	2 (9.09)	1 (4.55)	0.491	21 (95.45)	1 (4.55)	0 (0.00)	0.300
	Job	68 (83.95)	7 (8.64)	6 (7.41)		76 (93.83)	3 (3.70)	2 (2.47)		72 (88.89)	6 (7.41)	3 (3.70)	
	Student	67 (93.06)	4 (5.56)	1 (1.39)		64 (88.89)	7 (9.72)	1 (1.39)		70 (97.22)	0 (0.00)	2 (2.78)	
	House wife	24 (96.00)	0 (0.00)	1 (4.00)		21 (84.00)	2 (8.00)	2 (8.00)		24 (96.00)	1 (4.00)	0 (0.00)	

Initiative attempts (activity) of visitors to interact with Carnivore, herbivores and primates

The visitor's interaction with the tiger, deer and monkeys are described in Table 3 showing that 33.58% of males and 30.3% of females showed desirable friendly behavior towards the tigers. Interestingly, female visitors (25.76%, n=17) moved closer to the barrier than male visitors (21.64%, n=29) to interact with deer. Male visitors who interacted with monkeys by moving close to the barrier was 36.57% (n=49), followed by female visitors (30.30%, n=20). A total of 34.85% (n=23) of female visitors showed friendly behavior, more than male visitors (21.64%, n=29). In contrast, 39.55% (n=53) of male visitors showed undesirable behavior more than female visitors (30.30%, n=20). Teenage groups of visitors showed more interest (45.95%, n=17) towards the tiger. Additionally, a maximum of 31.13% (n=47) of adult visitors showed undesirable behavior towards tigers. It was observed that teenage visitors (27.03%, n=10) moved close to the deer barrier to interact with them more closely. It was demonstrated that a total of 71 (47.02%) adult visitors had shown undesirable behaviors towards deer than the aged (41.67%, n=5) and the teenage (35.14%, n=13) group. In the case of monkeys, 43.24% (n=16) of teenagers showed undesirable behaviors compared to aged and adult people. Maximum (71.43%) illiterate people moved closer to the tiger's cage and showed undesirable behavior towards deer (71.43%) and monkeys (42.86%) as well. Students (36.11%) showed friendly behavior towards the tiger compared to 32.10% (n=26) of jobholder visitors had shown undesirable behavior at the tiger cage.

Behavior displayed by carnivores, herbivores and primates

The behavior displayed by the tigers, deer and monkeys in response to visitors is presented in table 4. Our study demonstrated that the tiger was more active and alert towards female (77.27%; n=51) visitors' stimuli. The tiger showed stressed, inactivity, and ignoring behavior toward 29.10% of male visitors. Tiger showed activeness and alertness toward the illiterate group in 85.71% (n=6) cases. Deer were curious and excited to 51.52% and 49.25%

of female and male visitors. We found that the monkeys were curious and more excited towards female visitors (60.61%, n=40) than male visitors (52.99%, n=71). The monkeys were 28.57% (n=2) social and happy with the illiterate group. Our study observed that the tiger was active and alert towards the highest number (n=106) of adult visitors.

Visitors' expression/satisfaction after visiting the tiger, deer and monkey

Table 5 describes visitors' expressions after visiting the tiger, deer, and monkey. A comparison of the two sex groups showed that 77.27% (n=51) of female visitors were happier compared to male visitors (70.90%, n=95) after visiting the tiger. Both sexes were almost equally excited and happy towards the deer and monkeys. A maximum of 74.17% (n=112) of adult (20-35y) visitors were happy after visiting tigers. Most visitors in the relatively aged group (100.00%, n=12) were happy visiting the deer and monkeys. From an institutional educational perspective, it was found that 100.00% (n=7) of illiterate (no formal education) visitors were happy to see the tiger followed by literate (SSC, HSC. Diploma) visitors (72.16%, n=70) and higher study (graduate and University students) visitors (71.88%, n=69). The study demonstrated that 100.00% of illiterate visitors were happy visiting deer and monkeys.

4. DISCUSSION

Only a few studies concentrated on zoos and zoo animal perspectives in a Bangladesh context. However, all that research also focused on captive breeding, ecotourism, conservation, biodiversity, and disease prevalence of captive animals (Uddin, 2017). Visitors' impacts on zoo animals, which could be beneficial for ensuring zoo animal care and welfare, have generally been overlooked (Das Gupta et al., 2017).

Visitors demography

Our study demonstrated that the visitors' attitudes, interests, and expressions while visiting captive animals in the zoo varied with their demographic attributes. According to our study, most of the visitors were adult males visiting zoo facilities. From a Bangladesh perspective, the adult male population has its own source of income whereas females are

Table 3. Initiative attempts (activity) of visitors to interact with Carnivore, herbivore and primate

Variable (N=200)	Category	Tiger						Deer					Monkey				
		Move close to barrier n (%)	Banging on Barrier n (%)	Just watching n (%)	Show friendly behavior n (%)	Undesirable behavior n (%)	P value	Move close to barrier n(%)	Just watching n (%)	Show friendly behavior n (%)	Undesirable behavior n (%)	P value	Move close to barrier n (%)	Banging on Barrier n (%)	Just watching n (%)	Show friendly behavior n (%)	Undesirable behavior n (%)	P value
Sex	Male	45 (33.58)	15 (11.19)	2 (1.49)	38 (28.36)	34 (25.37)	0.806	29 (21.64)	20 (14.93)	21 (15.67)	64 (47.76)	0.348	49 (36.57)	1 (0.75)	2 (1.49)	29 (21.64)	53 (39.55)	0.196
	Female	17 (25.76)	7 (10.61)	1 (1.52)	20 (30.30)	21 (31.82)		17 (25.76)	8 (12.12)	16 (24.24)	25 (37.88)		20 (30.30)	2 (3.03)	1 (1.52)	23 (34.85)	20 (30.30)	
Age	Teenage (12-19)	17 (45.95)	2 (5.41)	0 (0.00)	10 (27.03)	8 (21.62)	0.000	10 (27.03)	7 (18.92)	7 (18.92)	13 (35.14)	0.848	13 (35.14)	0 (0.00)	1 (2.70)	7 (18.92)	16 (43.24)	0.888
	Adult (20-35)	40 (26.49)	18 (11.92)	1 (0.66)	45 (29.80)	47 (31.13)		34 (22.52)	19 (12.58)	27 (17.88)	71 (47.02)		53 (35.10)	3 (1.99)	2 (1.32)	41 (27.15)	52 (34.44)	
	Aged (35+)	5 (41.67)	2 (16.67)	2 (16.67)	3 (25.00)	0 (0.00)		2 (16.67)	2 (16.67)	3 (25.00)	5 (41.67)		3 (25.00)	0 (0.00)	0 (0.00)	4 (33.33)	5 (41.67)	
Education	Illiterate	5 (71.43)	1 (14.29)	1 (14.29)	0 (0.00)	0 (0.00)	0.009	1 (14.29)	0 (0.00)	1 (14.29)	5 (71.43)	0.494	1 (14.29)	0 (0.00)	0 (0.00)	3 (42.86)	3 (42.86)	0.866
	Literate	34 (35.05)	7 (7.22)	1 (1.03)	29 (29.90)	26 (26.80)		19 (19.59)	14 (14.43)	22 (22.68)	42 (43.30)		35 (36.08)	2 (2.06)	2 (2.06)	21 (21.65)	37 (38.14)	
	Higher study	23 (23.96)	14 (14.58)	1 (1.04)	29 (30.21)	29 (30.21)		26 (27.08)	14 (14.58)	14 (14.58)	42 (43.75)		33 (34.38)	1 (1.04)	1 (1.04)	28 (29.17)	33 (34.38)	
Occupation	Business	9 (40.91)	3 (13.64)	2 (9.09)	5 (22.73)	3 (13.64)	0.142	5 (22.73)	1 (4.55)	5 (22.73)	11 (50.00)	0.210	4 (18.18)	0 (0.00)	0 (0.00)	5 (22.73)	13 (59.09)	0.415
	Job	23 (28.40)	11 (13.58)	0 (0.00)	21 (25.93)	26 (32.10)		14 (17.28)	12 (14.81)	10 (12.35)	45 (55.56)		30 (37.04)	2 (2.47)	1 (1.23)	16 (19.75)	32 (39.51)	
	Student	22 (30.56)	5 (6.94)	1 (1.39)	26 (36.11)	18 (25.00)		21 (29.17)	10 (13.89)	16 (22.22)	25 (34.72)		27 (37.50)	1 (1.39)	1 (1.39)	22 (30.56)	21 (29.17)	
	House wife	8 (32.00)	3 (12.00)	0 (0.00)	6 (24.00)	8 (32.00)		6 (24.00)	5 (20.00)	6 (24.00)	8 (32.00)		8 (32.00)	0 (0.00)	1 (4.00)	9 (36.00)	7 (28.00)	

Table 4. Behavior displayed by Carnivore, Herbivore and Primate

Variable (N=200)	Category	Tiger				Deer						Monkey					
		Active & Alertness	Curiosity to visitors & excitement	Stressed, inactivity & ignore visitor	P value	Active & Alertness	Curiosity to visitors & excitement	Stressed, inactivity & ignore visitors	Frightened behavior	Sociality & happiness	P Value	Active & Alertness	Curiosity to visitors & excitement	Stressed, inactivity & ignore visitors	Frightened behavior	Sociality & happiness	P value
Sex	Male	88 (65.67)	7 (5.22)	39 (29.10)		16 (11.94)	66 (49.25)	3 (2.24)	11 (8.21)	38 (28.36)		28 (20.90)	71 (52.99)	7 (5.22)	1 (0.75)	27 (20.15)	
	Female	51 (77.27)	0 (0.00)	15 (22.73)	0.09	9 (13.64)	34 (51.52)	3 (4.55)	3 (4.55)	17 (25.76)	0.76	9 (13.64)	40 (60.61)	5 (7.58)	4 (6.06)	8 (12.12)	0.07
Age	Teenage (12-19)	25 (67.57)	0 (0.00)	12 (32.43)		5 (13.51)	21 (56.76)	1 (2.70)	0 (0.00)	10 (27.03)		3 (8.11)	20 (54.05)	3 (8.11)	1 (2.70)	10 (27.03)	
	Adult (20-35)	106 (70.20)	5 (3.31)	40 (26.49)	0.08	19 (12.58)	74 (49.01)	5 (3.31)	13 (8.61)	40 (26.49)	0.73	30 (19.87)	87 (57.62)	8 (5.30)	2 (1.32)	24 (15.89)	0.02
	Aged (35+)	8 (66.67)	2 (16.67)	2 (16.67)		1 (8.33)	5 (41.67)	0 (0.00)	1 (8.33)	5 (41.67)		4 (33.33)	4 (33.33)	1 (8.33)	2 (16.67)	1 (8.33)	
Education	Illiterate	6 (85.71)	1 (14.29)	0 (0.00)		2 (28.57)	4 (57.14)	0 (0.00)	0 (0.00)	1 (14.29)		1 (14.29)	2 (28.57)	1 (14.29)	1 (14.29)	2 (28.57)	
	Literate	64 (65.98)	2 (2.06)	31 (31.96)	0.16	10 (10.31)	49 (50.52)	4 (4.12)	5 (5.15)	29 (29.90)	0.72	20 (20.62)	52 (53.61)	8 (8.25)	2 (2.06)	15 (15.46)	0.30
	Higher study	69 (71.88)	4 (4.17)	23 (23.96)		13 (13.54)	47 (48.96)	2 (2.08)	9 (9.38)	25 (26.04)		16 (16.67)	57 (59.38)	3 (3.13)	2 (2.08)	18 (18.75)	
Occupation	Business	17 (77.27)	2 (9.09)	3 (13.64)		2 (9.09)	11 (50.00)	0 (0.00)	2 (9.09)	7 (31.82)		7 (31.82)	9 (40.91)	0 (0.00)	1 (4.55)	5 (22.73)	
	Job	48 (59.26)	5 (6.17)	28 (34.57)	0.05	12 (14.81)	34 (41.98)	2 (2.47)	9 (11.11)	24 (29.63)	0.42	19 (23.46)	41 (50.62)	8 (9.88)	1 (1.23)	12 (14.81)	0.09
	Student	54 (75.00)	0 (0.00)	18 (25.00)		8 (11.11)	41 (56.94)	2 (2.78)	1 (1.39)	20 (27.78)		7 (9.72)	43 (59.72)	3 (4.17)	2 (2.78)	17 (23.61)	
	House wife	20 (80.00)	0 (0.00)	5 (20.00)		3 (12.00)	14 (56.00)	2 (8.00)	2 (8.00)	4 (16.00)		4 (16.00)	18 (72.00)	1 (4.00)	1 (4.00)	1 (4.00)	

Table 5. Visitors' expression/satisfaction just after visiting tiger, deer and monkey cage

Variable (N=200)	Category	Tiger					Deer			Monkey				
		Happy n (%)	Normal n (%)	Frightened n (%)	Bored n (%)	P value	Happy n (%)	Normal n (%)	P value	Happy n (%)	Normal n (%)	Frightened n (%)	Bored n (%)	P value
Sex	Male	95 (70.90)	17 (12.69)	6 (4.48)	16 (11.94)		129 (96.27)	5 (3.73)		119 (88.81)	8 (5.97)	6 (4.48)	1 (0.75)	
	Female	51 (77.27)	8 (12.12)	4 (6.06)	3 (4.55)	0.39	63 (95.45)	3 (4.55)	0.78	57 (86.36)	4 (6.06)	3 (4.55)	2 (3.03)	0.67
Age	Teenage (12-19)	26 (70.27)	5 (13.51)	2 (5.41)	4 (10.81)		34 (91.89)	3 (8.11)		33 (89.19)	1 (2.70)	2 (5.41)	1 (2.70)	
	Adult (20-35)	112 (74.17)	18 (11.92)	7 (4.64)	14 (9.27)	0.99	146 (96.69)	5 (3.31)	0.32	131 (86.75)	11 (7.28)	7 (4.64)	2 (1.32)	0.78
	Aged (35+)	8 (66.67)	2 (16.67)	1 (8.33)	1 (8.33)		12 (100.00)	0 (0.00)		12 (100.00)	0 (0.00)	0 (0.00)	0 (0.00)	
Education	Illiterate	7 (100.00)	0 (0.00)	0 (0.00)	0 (0.00)		7 (100.00)	0 (0.00)		7 (100.00)	0 (0.00)	0 (0.00)	0 (0.00)	
	Literate	70 (72.16)	14 (14.43)	6 (6.19)	7 (7.22)	0.56	91 (93.81)	6 (6.19)	0.29	85 (87.63)	5 (5.15)	5 (5.15)	2 (2.06)	0.94
	Higher study	69 (71.88)	11 (11.46)	4 (4.17)	12 (12.50)		94 (97.92)	2 (2.08)		84 (87.50)	7 (7.29)	4 (4.17)	1 (1.04)	
Occupation	Business	15 (68.18)	3 (13.64)	2 (9.09)	2 (9.09)		22 (100.00)	0 (0.00)		22 (100.00)	0 (0.00)	0 (0.00)	0 (0.00)	
	Job	55 (67.90)	13 (16.05)	2 (2.47)	11 (13.58)	0.57	78 (96.30)	3 (3.70)	0.57	72 (88.89)	4 (4.94)	4 (4.94)	1 (1.23)	0.35
	Student	57 (79.17)	6 (8.33)	4 (5.56)	5 (6.94)		69 (95.83)	3 (4.17)		63 (87.50)	5 (6.94)	2 (2.78)	2 (2.78)	
	House wife	19 (76.00)	3 (12.00)	2 (8.00)	1 (4.00)		23 (92.00)	2 (8.00)		19 (76.00)	3 (12.00)	3 (12.00)	0 (0.00)	

insecure to visit without a male guardian due to safety and inadequate facilities (Jashimuddin et al., 2004). The largest age group most likely to visit is between 15-24 years (37.9%), with the majority (43.4%) having a higher educational background. This study found that the highest number of visitors come to zoos mostly for recreational purposes; similar to other studies (Ahmad et al., 2015). Bangladesh, a developing country with low- and middle-income communities' people, mostly relying on the few zoos and kids' parks across the country for recreation (Rana et al., 2010). However, higher-class people have the ability to visit overseas recreational facilities. In this regard, a few studies describe educational motives as the purpose of visiting a zoo, which was dissimilar to this study (Turley, 2001; UlokoandIwar, 2011; Adams and Salome, 2014). Most of the visitors in our study were visiting the zoo with family and friends to spend quality time;that corresponded previous study (Jashimuddin et al., 2004). This study found that the maximum number of visitors visited the zoo for the first time and only a few visitors visited the zoo yearly, which is inconsistent with the previous study (Jashimuddin et al., 2004). It is evident that literate people might have more of an interest in visiting these facilities than the illiterate. An earlier study described that educated people are generally inclined to visit zoological gardens (Jashimuddin et al., 2004). In contrast, illiterate visitors can hardly understand the warning signs given on the notifications and could only have the watch group in the visitors list (Hassan and Sharma, 2017).

Attitude and behavior of visitors towards the animals

We observed that visitors do sometimes provoke fear, shout in front of the cage, tease the animals, and sometimes throw objects. Previous studies have illustrated that visitors have exhibited undesirable behaviors toward primates in captive conditions (Das Gupta et al., 2017). Moreover, we found that visitors were sometimes frightened after visiting the monkeys (primate) and tigers (carnivores); however, no visitors were found to be scared of deer (herbivores) after visiting this species. It might be due to cuteness along with the calm and quiet nature of the deer. Our study demonstrated that both teenagers (12-19) and adults (20-35) interacted with monkeys (primates) more than aged (35+) visitors. Previously, a similar study to ours has found that adult males are attracted mostly to primates (monkeys) (Sabbatini et al., 2006). Our study found that most of the aged visitors were not interested or indifferent towards the tigers whereas they showed more interest in watching and interacting with the deer than the teenagers and aged visitors. Adults were shown to have possessed the more stable behavior and were attracted by deer's colorful coats and cute facial expressions. In contrast, teenagers were attracted to the monkeys through their naughty behavior and human-like facial expressions. In a previous study, researchers described monkeys as human-like, obedient, and cute both in the wild and in zoos (Heinrich and Birney, 1992). Interestingly, our study has shown that the maximum number of housewives were interested in seeing tigers and monkeys compared to deer. The student's top listed visiting interested animals were monkeys in our study findings. Previous studies demonstrated that certain visitor behaviors such as shouting, waving, banging on the glass, and throwing objects could potentially be a source of stress for some species in the zoo (Sherwen et al., 2014). Our study has also shown several undesirable behaviors of visitors such as moving close to the barrier, offering food, shouting, provoking fear, teasing, and throwing objects (Das Gupta et al., 2017).

5. CONCLUSION

This study showed that a diversified group of visitors visited the Chattogram zoo, and because of their interactions with and interests in the animals, the behavior of the animals likewise varied to differing degrees. The more friendly the tourists had been, the fewer negative and more favorable attitudes there were reflected in the animals. Female tourists had a more positive attitude toward the animals, and the teenagers, on the other hand, were more eager to interact with the animals and displayed a more positive attitude. In conclusion, as there are varied degrees of visitor attitudes and responses, as well as animal behavior, a better welfare protocol needs to be established at zoos to ensure the animals' welfare and visitors' positive experiences. In addition, the assessment of the

human-animal interactions needs to be done across all the zoos in Bangladesh to explore the complete picture of zoo welfare and thus recommended in order to fine-tune the better welfare protocol.

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