



## Original Article

# Knowledge and Attitude to Biomedical Research of the Post-Graduate Medical Students in Bangladesh

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### Abstract

**Background:** Research is the integral part of post-graduation course curriculum. If steps are not taken at an early stage by medical postgraduates who will walk in the path of research in future, the quality of research and its application may be compromised. Students had variable perceptions towards research. The findings of this study could provide insights to improve research training.

**Objectives:** The aim of this study was to assess knowledge and to find out attitude to biomedical research of the post-graduate medical students in Bangladesh.

**Materials & Methods:** This cross-sectional type of descriptive study was carried out in the community Medicine Department of Rajshahi Medical College over a period of 12 months from January to December 2020 among the post-graduate students of different medical colleges. Approval from the Ethical Review Committee (ERC) was obtained prior to the commencement of the study. Purposive sampling technique was used. Pre-designed, validated, structured questionnaire was used to gather information from 325 participants on knowledge and 5-point Likert scale was used for assessment of attitude.

**Results:** In this study excellent knowledge was considered in  $\geq 80\%$  correct answers and positive attitude was considered in  $\geq 60$  score. Out of the 325 study respondents, majority (53.5%) of them were male and pursuing post-graduation in different subjects. Among the respondents, 145 (44.6%) of students had good knowledge, 119 (36.60%) of students had excellent knowledge and 190 (58.5%) had positive attitude toward medical research. Relationship of level of knowledge on biomedical research was not statistically significant for age, sex, religion, marital status, parental and spouse educational status ( $P > 0.05$ ). But association of knowledge was statistically significant for running post-graduation course, type of research involvement and type of medical college of MBBS passing ( $P < 0.05$ ). Relationship of attitude to biomedical research of the respondents was not statistically significant for age, religion, type of research involvement, type of medical college of MBBS passing, running post-graduation course, marital status, parental and spouse educational status ( $P > 0.05$ ). But male had more positive attitude to biomedical research than female ( $P < 0.05$ ).

**Conclusion:** The study revealed that the respondents had a good knowledge and positive attitude toward biomedical research but they were not able to transform their knowledge and attitude into actual practices.

**Keywords:** Biomedical research, Knowledge, Attitude.

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### Introduction

The word research is derived from the Middle French “recherche” which means “to go about

seeking”. The term itself also being derived from the Old French term “recherchier” a compound

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word from “re” + “cerchier” or “searcher” which means ‘search’.<sup>1</sup>

The earliest recorded use of the term was in 1577. Research is “creative and systematic work undertaken to increase the stock of knowledge”. It involves the collection, organization and analysis of information to increase understanding of a topic or issue.<sup>2</sup> ‘Life without inquiry is not worth living for a human being’ (Socrates). People were not wise because they thought that they knew things when they did not. It was only in the sense that he was aware of his own ignorance that he found he was wiser than other people. It is this awareness of the need to know, the act of inquiry and deductive or inductive reasoning that results in the generation of new knowledge.<sup>2</sup> For this the scientific method is the most sophisticated and reliable.<sup>3</sup> Biomedical research must be predicated on content and contextual relevance without which is not only purposeless but also unethical. It is considered unethical to waste scarce resources or to subject participants to processes that have a high futility quotient.<sup>4</sup>

Today’s health research is tomorrow’s health care. Biomedical research forms the backbone of rapidly evolving world of medical sciences. Developing interest and pursuing a future research career in the field of medical science requires appropriate priming during the undergraduate period. The idea behind conducting any kind of research in medical education not only helps the students in enhancing their knowledge of disease but also help in building critical thinking skills. With the current prevailing system of medical education in Bangladesh research doesn’t form an essential component of undergraduate curriculum. However, as per Bangladesh Medical & Dental Council (BMDC), a postgraduate student can earn a title only after carrying out research work and compiling the write up of their research in the form of a thesis in the post-graduation courses.<sup>5</sup> Same situation is also prevailing in our neighboring countries. Negative attitudes toward research serve as an obstacle to learn associated with poor performance in research.<sup>6</sup> The findings of the study will assist in identifying gaps in the research knowledge, practice, training and suggest

means for improving research training. So one of the purpose of the study is to establish the knowledge level of post-graduate medical students and attitude towards it in our country.

## Materials and Methods

This was a cross sectional type of descriptive study at the Department of Community Medicine, Rajshahi Medical College, Rajshahi from January 2020 to December 2020 to assess the knowledge and attitude to biomedical research of the post-graduate medical students in Bangladesh. All post-graduate medical students in the courses of Ph. D, MD, MS, FCPS, M. Phil, MPH & Diploma of different Medical Colleges under different Universities in Bangladesh were included in this study. A purposive sampling technique was used and the total sample size was 325. Consulting with the supervisor and reviewing the previous published literature researcher developed the research instrument for the study. Then

to finalize the procedure and to evaluate the effectiveness of the questionnaire pretest was carried out among 15 post-graduate students. After pretest, some correction was done and the questionnaire was finalized. Then respondents were briefed about the purpose of the study prior to data collection

and their informed consent was taken. Data were collected from the respondents by google form through a self-administered semi-structured questionnaire and Likert scale scoring. Baseline information of some selected socio-demographic characteristics of the respondents and information regarding knowledge and attitude to biomedical research were collected. All efforts were made to collect data accurately. After collecting data the google forms were converted into x-cell sheet. Then the completeness and internal consistency of questions were checked. Participants who did not fill out all the questions in the google form were removed from the sample. Then data were cleaned by editing, coding, recoding and categorizing. Data were rechecked to detect errors and to maintain validity. Then x-cell sheet was converted into SPSS file. All data were analyzed by using the ‘Statistical Package for Social Sciences (SPSS)’

software, 24-version. Categorical variables were summarized by using numbers and percentages while continuous variables were summarized by means  $\pm$  standard deviation (SD). An independent t-test was used to compare continuous variables with two categories. Association of knowledge and attitude with socio-demographic characteristics were determined by chi-square test. A p-value  $< 0.05$  was considered statistically significant.

In knowledge part there were 50 structured questions having binary responses for each question no = 0 to yes=1; 0 for negative answer and 1 for positive answer. So minimum knowledge score was 0 and maximum knowledge score was 50 for each respondent. Higher performance related to higher score obtained from knowledge portion of the questionnaire. Then this knowledge score was divided into 5 categories (poor knowledge-0 to 10, fair knowledge-11 to 20,

average knowledge-21 to 30, good knowledge-31 to 40 and excellent knowledge-41 to 50). For the purpose of making 2x2 contingency table these 5 knowledge categories were converted into 2 categories (poor to average knowledge and good to excellent knowledge).

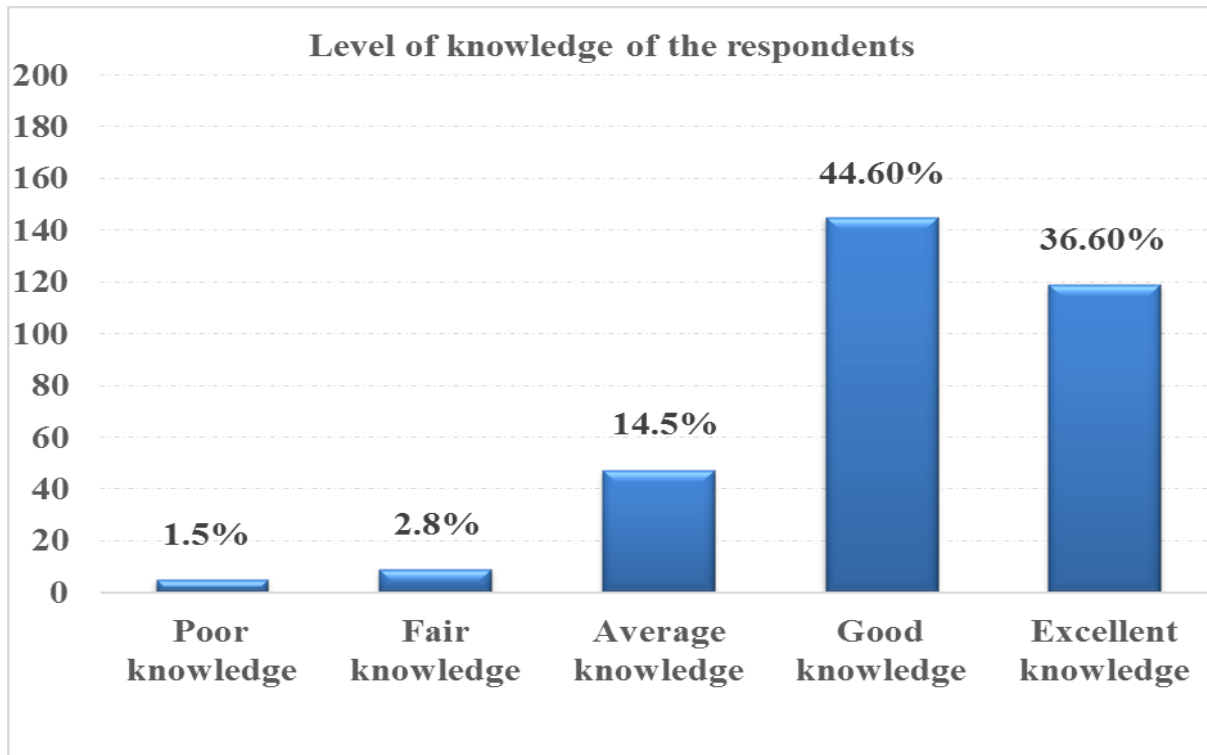
For assessment of attitude there were 15 statements in Likert scale and score was 1-5 for each statement. So, for each respondent minimum attitude score was 15 and maximum attitude score was 75. Higher performance related to higher score obtained from the attitude portion of the questionnaire. Then attitude score was divided into 3 categories (Negative attitude-15 to 30, neutral attitude-31 to 59 and positive attitude-60 to 75). For making 2x2 contingency table these 3 categories of attitude were converted into 2 categories (Negative to neutral attitude and positive attitude).

## Results

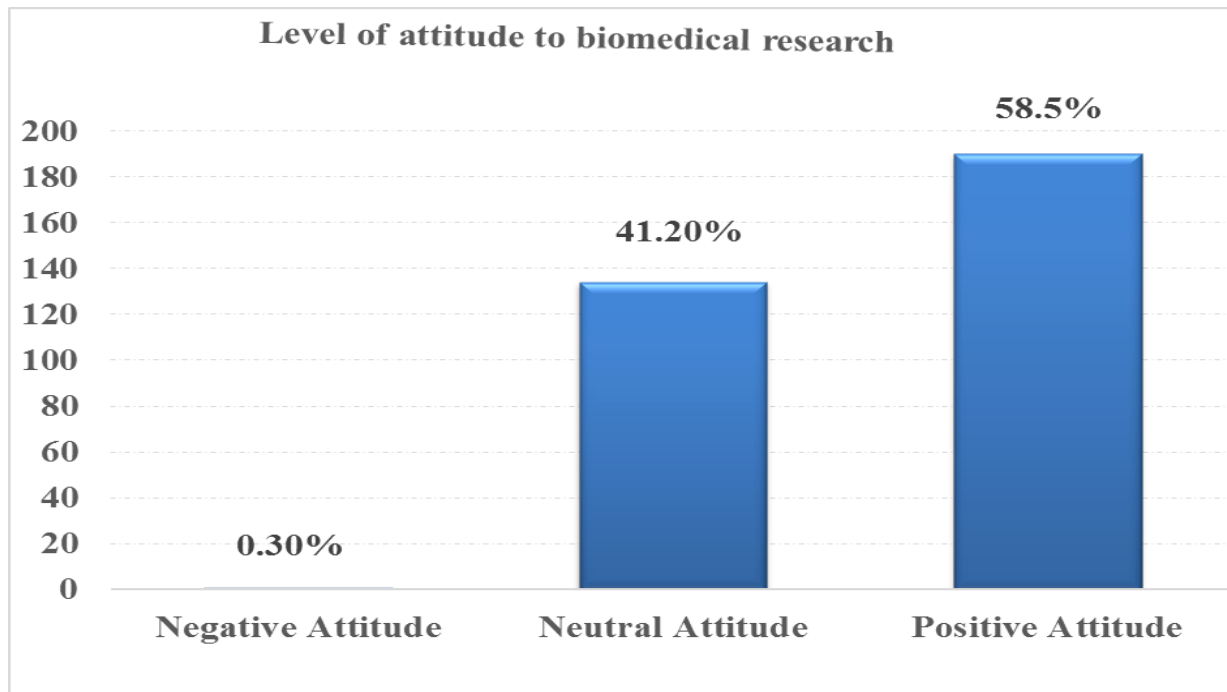
Out of the 325 study respondents, more than half 174(53.50%) of the respondents were male and rest 151(46.50%) were female. The age of most of the respondents 287(88.3%) were in the age group of 31-40 years and the mean age of the respondents was  $\bar{X} \pm SD = 33.56 \pm 3.10$  years. Maximum respondents 269(82.80%) were Muslim. Majority of the respondents 290(89.20%) were married. Most of the respondents 282(86.80%) completed their MBBS degree from Government medical college. At the time of data collection majority of the respondents 148(45.50%) were in MD/MS course. My study respondents involved in research for their academic purpose. Out of 325 total respondents 210(64.60%) were involved in thesis, 4(22.80%) were in dissertation and rest 41(12.60%) Diploma students who were not involved in thesis or dissertation because no type of study was included in diploma course. Among 325 total respondents 145(44.60%) had good knowledge, 119(36.6%) had excellent knowledge, 47(14.5%) had average knowledge, 9(2.8%) had fair knowledge and 5(1.5%) had poor knowledge on biomedical research. Majority of the respondents 190(58.5%) had positive attitude, 134(41.2%) had neutral attitude and only 1(0.3%) had negative attitude to biomedical research. Relationship of level of knowledge on biomedical research was not statistically significant for age, sex, religion, marital status, parental and spouse educational status ( $P > 0.05$ ). But association of knowledge was statistically significant for running post-graduation course, type of research involvement and type of medical college of MBBS passing ( $P < 0.05$ ). Relationship of attitude to biomedical research of the respondents was not statistically significant for age, religion, type of research involvement, type of medical college of MBBS passing, running post-graduation course, marital status, parental and spouse educational status ( $P > 0.05$ ). But male had more positive attitude to biomedical research than female ( $P < 0.05$ ).

**Table I: Personal information of the respondents (n=325)**

<i>Variables</i>	<i>Categories</i>	<i>Frequency</i>	<i>Percentage (%)</i>
<i>Age in years</i>	21-30 years	24	7.4
	31-40 years	287	88.3
	41-50 years	14	4.3
<i>Gender</i>	Male	174	53.5
	Female	151	46.5
<i>Religion</i>	Muslim	269	82.8
	Hindu	53	16.3
	Christian	3	0.9
<i>Marital status</i>	Single	35	10.8
	Married	290	89.2
<i>Running post-graduation course</i>	Ph.D	3	0.9
	MD/MS	148	45.5
	FCPS	74	22.8
	M.phil	37	11.4
	MPH	22	6.8
	Diploma	41	12.6
<i>Involvement of research</i>	Thesis	210	64.6
	Dissertation	74	22.8
	No thesis no dissertation	41	12.6
<i>Medical college of MBBS passing</i>	Govt. medical college	282	86.8
	Private medical college	43	13.23



**Figure 1: Distribution of the respondents by level of knowledge on biomedical research (n=325)**



**Figure 2: Level of attitude to biomedical research (n=325)**

**Table II: Attitude to biomedical research in 5-point Likert scale (n=325)**

<b>Attitude to research</b>	<b>Strongly disagree</b>	<b>Disagree</b>	<b>Neutral</b>	<b>Agree</b>	<b>Strongly agree</b>
Role of research is important	17(5.2%)	1(0.3%)	4(1.2%)	81(24.9%)	222(68.3%)
Research is urgent in MBBS level	5(1.5%)	33(10.2%)	33(10.2%)	180(55.4%)	74(22.8%)
Research in MBBS has an impact on higher level	6(1.8%)	17(5.2%)	20(6.2)	148(45.5%)	134(41.2%)
Research may be compulsory in MBBS level	6(1.8%)	53(16.3%)	53(16.3%)	145(44.6%)	68(20.9%)
Research is a burden	35(10.8%)	123(37.8%)	43(13.2%)	98(30.2%)	26(8%)
Research amplify teamwork spirit	4(1.2%)	9(2.8%)	9(2.8%)	207(63.7%)	96(29.5%)
Research raises critical thinking	6(1.8%)	13(4%)	9(2.8%)	179(55.1%)	118(36.3%)
Research improves clinical skills	6(1.8%)	14(4.3%)	22(6.8%)	179(55.1%)	104(32%)
Research may be an exclusive career	4(1.2%)	8(2.5%)	31(9.5%)	167(51.4%)	115(35.4%)
Financial value are good for research	9(2.8%)	47(14.5%)	78(24%)	143(44%)	48(14.8%)
Research innovate in the medical field	5(1.5%)	2(0.6%)	9(2.8%)	163(50.2%)	146(44.9%)
Research helps in physiological & pathological ways	3(0.9%)	3(0.9%)	30(9.2%)	215(66.2%)	74(22.8%)
Research ascertain an intervention	1(0.3%)	7(2.2%)	18(5.5%)	231(71.1%)	68(20.9%)
Research enriches medical education	5(1.5%)	0	6(1.8%)	164(50.5%)	150(46.2%)
Research helps to change policy	3(0.9%)	6(1.8%)	21(6.5%)	185(56.9%)	110(33.8%)

**Table III: Relationship between personal information and level of knowledge on biomedical research of the respondents (325)**

Personal information	Group		p-value
	Poor to average knowledge	Good to excellent knowledge	
	N (%)	N (%)	
<b>Age</b>			
≤ 35 years	52 (19.3)	218 (80.7)	
> 35 years	9 (16.4)	46 (83.6)	> 0.05
<b>Sex</b>			
Female	28 (18.5)	123 (81.5)	> 0.05
Male	33 (19.0)	141 (81.0)	
<b>Religion</b>			
Muslim	50 (18.6)	219 (81.4)	
Hindu	9 (17.0)	44 (83.0)	> 0.05
Christian	2 (66.7)	1 (33.3)	
<b>Marital status</b>			
Single	8 (22.9)	27 (77.1)	> 0.05
Married	53 (18.3)	237 (81.7)	
<b>Running post-graduation course</b>			
Ph.D	0 (0.0)	3 (100)	
MD/MS	26 (17.6)	122 (82.4)	
FCPS	12 (16.2)	62 (83.8)	0.05
M.phil	6 (16.2)	31 (83.8)	
MPH	2 (9.1)	20 (90.9)	
Diploma	15 (36.6)	26 (63.4)	
<b>Type of research</b>			
Thesis	34 (16.2)	176 (83.8)	
Dissertation	12 (16.2)	62 (83.8)	< 0.05
No thesis no dissertation	15 (18.8)	264 (81.2)	
<b>Medical college in MBBS level</b>			
Govt. medical college	48 (17.0)	234 (83.0)	< 0.05

Private medical college	13 (30.2)	30 (69.8)	
<b>Educational status of father</b>			
Undergraduate	13 (14.1)	79 (85.9)	> 0.05
Graduate	48 (20.6)	185 (79.4)	
<b>Educational status of mother</b>			
Undergraduate	34 (16.4)	173 (83.6)	> 0.05
Graduate	27 (22.9)	91 (77.1)	
<b>Educational status of spouse</b>			
Undergraduate	2 (33.3)	4 (66.7)	> 0.05
Graduate	51 (18.0)	233 (82.0)	
<b>Level of attitude to research</b>			
Negative to neutral attitude	36 (26.7)	99 (73.3)	< 0.05
Positive attitude	25 (13.2)	165 (86.8)	

**Table IV: Relationship between personal information and level of attitude to biomedical research of the respondents (325)**

Personal information	Group		p-value
	Negative to neutral attitude N (%)	Positive attitude N (%)	
<b>Age</b>			
≤ 35 years	110 (40.7)	160 (59.3)	
> 35 years	25 (45.5)	30 (54.5)	> 0.05
<b>Sex</b>			
Female	72 (47.7)	79 (52.3)	< 0.05
Male	63 (36.2)	111 (63.8)	
<b>Religion</b>			
Muslim	118 (43.9)	151 (56.1)	
Hindu	16 (30.2)	37 (69.8)	> 0.05
Christian	1 (33.3)	2 (66.7)	
<b>Marital status</b>			
Single	11 (31.4)	24 (68.6)	> 0.05



Married	124 (42.8)	166 (57.2)	
<b>Running post-graduation course</b>			
Ph.D	1 (33.3)	2 (66.7)	
MD/MS	68 (45.9)	80 (54.1)	
FCPS	29 (39.2)	45 (60.8)	> 0.05
M.phil	18 (48.6)	19 (51.4)	
MPH	3 (13.6)	19 (86.4)	
Diploma	16 (39.0)	25 (61.0)	
<b>Type of research</b>			
Thesis	90 (42.9)	120 (57.1)	
Dissertation	29 (39.2)	45 (60.8)	> 0.05
No thesis no dissertation	16 (39.0)	25 (61.0)	
<b>Medical college in MBBS level</b>			
Govt. medical college	114 (40.4)	168 (59.6)	> 0.05
Private medical college	21 (48.8)	22 (51.2)	
<b>Educational status of father</b>			
Undergraduate	37 (40.2)	55 (59.8)	> 0.05
Graduate	98 (42.1)	135 (57.9)	
<b>Educational status of mother</b>			
Undergraduate	90 (43.5)	117 (56.5)	> 0.05
Graduate	45 (38.1)	73 (61.9)	
<b>Educational status of spouse</b>			
Undergraduate	3 (50.0)	3 (50.0)	> 0.05
Graduate	121 (42.6)	166 (57.1)	

## Discussion

Biomedical research claims high importance in understanding and accelerating the medical research and associated subjects. Considering the importance of human health and several emergency medical and clinical issues associated with it, prime attention towards biomedical research is of great significance. Biomedical research is such unique platform to collect and disseminate state-of-the-art scientific

understanding on biomedicine and related discipline.

It was a cross sectional study to find out perception on biomedical research and barriers to its practice of the post-graduate medical students in Bangladesh. Due to time limitation cross-sectional study was chosen. A time schedule was prepared at the beginning of the study. At first, topics of the study was selected. Literature related to the study were reviewed. Data collection instrument was prepared, pre-tested and finalized.

Then protocol was developed and approved by the Ethical Review Board of Rajshahi Medical College. Then after necessary correction and modification of the instrument, data collection was done from August to September, 2020. The study was carried out on the post-graduate medical students in the whole country.

Among 325 total respondents 145(44.60%) had good knowledge, 119(36.6%) had excellent knowledge, 47(14.5%) had average knowledge, 9(2.8%) had fair knowledge and 5(1.5%) had poor knowledge on biomedical research. A Cross-Sectional Study by Ibrahim Abushouk et al.<sup>7</sup> on 420 undergraduate students from the Faculty of Medicine in an Egyptian Medical School found low knowledge score (20% to 43.3%) on a scale of six questions. This dissimilarity with my study may be due to we used 50 structured questions for knowledge assessment and my study was only on post graduate medical students. In my study, topics on which knowledge were assessed minimum right answer came from study design portion that indicates study design part was not clear to my study respondents and mean knowledge score was  $36.59 \pm 8.2$ . Two studies done by Aldugiemani et al.<sup>8</sup> and Bilal et al.<sup>9</sup> among medical students of Karachi found that male had more positive attitude than female ( $72.97 \pm 20.54$  vs  $67.09 \pm 21$ ) and mean knowledge score was  $70.39 \pm 15.67$ . In this study it was assumed that there was no relationship between age and knowledge on biomedical research of the respondents by applying independent-T test ( $P > 0.05$ ). Also relationship of level of knowledge on biomedical research was not statistically significant for sex, religion, marital status, parental and spouse educational status by applying chi-square test ( $P < 0.05$ ). Similar findings were in a study by A et al.<sup>10</sup> among undergraduate medical students in Narayana medical college, India. Respondents who completed MBBS degree from Govt. medical college had more good to excellent knowledge than those who completed MBBS degree from private medical college ( $P < 0.05$ ).

Out of total 325 respondents, majority of the respondents 190(58.5%) had positive attitude, 134(41.2%) had neutral attitude and only 1(0.3%)

had negative attitude to biomedical research. This data were collected on a five point Likert scale (1-5 scoring). In this study mean attitude score was  $60.73 \pm 6.95$  which was nearly similar to the study conducted by Amin et al.<sup>11</sup> in three Arab Universities. In Kuwait University (KU) held a higher attitude score of  $69.1 \pm 9.0$  compared to King Faisal University ( $66.2 \pm 7.4$ ) and Arab Gulf University ( $66.2 \pm 7.2$ ). Another study by Alghamdi et al.<sup>12</sup> found that 97.1% (167/172) agreed research is important in the medical field and 67.4% (116/172) believed conducting research should be mandatory for undergraduate students. In my study 222(68.3%) respondents strongly agreed with 'role of research is important in the medical field and 145(44.6%) with 'research participation should be made compulsory in MBBS level'. This discrepancy with my study may be due to sample size was not equal. In this study it was assumed that there was no relationship between age and attitude to biomedical research of the respondents by applying independent-T test ( $P > 0.05$ ). Also relationship of attitude to biomedical research of the respondents was not statistically significant for religion, type of research involvement, type of medical college of MBBS passing, running post-graduation course, marital status, parental and spouse educational status ( $P > 0.05$ ). But male had more positive attitude to biomedical research than female ( $P < 0.05$ ). But a study by Althubaiti et al.<sup>13</sup> at the college of medicine, Saudi Arabia found that female students showed more positive attitude towards research. On the other hand a study by S.S<sup>14</sup> at Wah Medical College, Pakistan among both undergraduate and post-graduate medical students found that the attitude towards research among male and female students was insignificant ( $P > 0.05$ ). Respondents who had positive attitude to biomedical research had more good to excellent knowledge on research than those who had negative attitude ( $P < 0.05$ ).

## Conclusion

In our country postgraduate students are introduced to the concept of designing and conducting research after entering post-graduation course. Although a light overview on research is given to the undergraduate students in the third

year of MBBS course but it is not so effective. Medical research carried out postgraduate students in Bangladesh is disappointing compared to developed countries. Building a sound knowledge with encouragement and provision of favorable environment are needed if we are keen to improve the quality of medical research in Bangladesh.

**Conflict of interest:** None declared.

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