LEVEL OF AWARENESS, KNOWLEDGE AND ATTITUDE REGARDING RESEARCH AMONG POST GRADUATE TRAINEE DOCTORS IN TEACHING HOSPITALS IN KOLKATA

Clinical Research

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ABSTRACT

Aims and objectives: In this study, we wanted to assess the awareness, knowledge, and attitudes regarding research among postgraduate trainee doctors in teaching hospitals of Kolkata and identify the measures that can be taken to improve the research practices of the postgraduate residents. **Material and Methods:** A questionnaire-based survey was carried out among Postgraduate trainee doctors (DNB & MD PG residents) from teaching hospitals in Kolkata duration of the study was approximately 1 year between July 2018- June 2019. The questionnaire was designed based on guidelines of knowledge of research methodology, attitudes and practices towards research, and measures to improve research practices. **Results:** In the present study the level of awareness, knowledge, attitudes of 170 post-graduate trainee doctors from the clinical and pre/para clinical specialty was evaluated, difficulties faced by them in conducting research, and suggestions on how research can be promoted among PG residents was taken. **Conclusion:** The present study revealed that the residents from both clinical and para/clinical specialties had a fair knowledge about research. They had a positive attitude toward research, but they are unable to transform their knowledge and attitude into actual practices.

KEYWORDS

Clinical research, Research skills, Post-graduate doctor, Teaching hospital, Attitude, knowledge, postgraduate student, practice, research,

INTRODUCTION

Research comprises of work undertaken on a systemic basis to increase the stock of knowledge, including the knowledge of an individual, culture, and society and the use of this stock of knowledge to devise new applications. It is used to establish and confirm facts, reaffirm the results of previous work, solve new or existing problems, support theorems, or develop new theories.¹

It is important to find out postgraduate students' perceptions and attitudes towards their thesis work to identify motivating factors/problems among them. As thesis forms the first stepping stone for them in medical science, evaluation of these factors can be of great help in cultivating a positive attitude and interest toward research in the field of medicine.

It was felt that the existing level of knowledge, awareness, and attitudes towards research among these doctors who already are conducting at least one research study for their dissertation should be evaluated. So, we decided to undertake a cross-sectional study to assess and evaluate the knowledge, awareness, and attitudes of post-graduate resident doctors in teaching hospitals of Kolkata regarding research skills including difficulties in conducting research and measures that can be taken to solve them. This will identify gaps in the development of research orientation in the healthcare sector.

Different studies showed that the data regarding knowledge, attitudes, and practices toward medical research among postgraduate students pursuing postgraduate studies in India is lacking. It is felt that the existing level of knowledge and awareness among the resident doctors

who have already conducted/are conducting at least one research study for their dissertation should be evaluated. Hence, the present study was carried out to assess the research-related knowledge, attitude, and practices of post-graduate trainee doctors in teaching hospitals of Kolkata.

MATERIALS AND METHODS

Site of study: Postgraduate teaching hospitals in Kolkata (both Government & Private, DNB & MD)

Study Population: Clinical and paraclinical Postgraduate trainee doctors.

Study Design: a cross-sectional multicentre, prospective survey was conducted using a structured and pre-validated questionnaire.

Duration of study: The duration of the study was approximately 1 year between July 2018- June 2019

Inclusion Criteria: Postgraduate trainee doctors (DNB & MD PG residents) from teaching hospitals in Kolkata during the period of study.

Exclusion Criteria: Non-training medical officers working in teaching hospitals of Kolkata. Postgraduate diploma resident doctors where research and thesis are not included in the syllabus.

Data Collection: The questionnaire was designed based on guidelines of knowledge of research methodology, attitudes, and practices

towards research and measures to improve research practices and drafted in the English language.

Statistical Methods: A questionnaire-based survey was carried out among PG resident doctors from teaching hospitals from Kolkata through an electronic survey using the web-based software "survey monkey" (<http://www.surveymonkey.com>) which allowed secure, anonymous distribution of questionnaire via the internet.

Statistical analysis: A total of 170 postgraduate trainee doctors were enrolled in this study and data was analyzed. Descriptive statistical analysis was performed to calculate the means with corresponding standard deviations (S.D.). Using this software, basic cross-tabulation and associations were performed. Chi-square test was used to test the association of different study variables. Z-test (Standard Normal Deviate) was used to test the significant difference between the two proportions. $p < 0.05$ was considered statistically significant.

RESULTS

Demography

Table 1: Distribution of age of the participants

Age Group (in years)	Number	%
23 - 25	32	18.0%
26 - 28	76	76.4%
>28	62	5.6%
Total	170	100.0%
Mean $\pm$ s.d.	27.81$\pm$2.69	
Median	27	
Range	23 - 33

Figure 1: Distribution of age of the participants

The mean age (mean $\pm$ s.d.) of the participants was 27.81 $\pm$ 2.69 years with range 23 – 33 years and the median age was 27 years

Table 2: Gender Distribution of the Enrolled PGT Doctors

Gender	Number	%
Male	99	58.2%
Female	71	41.8%
Total	170	100.0%
Male:Female	1.4:1.0

Figure 1: Gender Distribution of the Enrolled PGT Doctors

Majority of the participants (58.2%) were males.

Table 3: Distribution of field of specialization of the participants

Field of specialization	Number	%
Clinical	103	60.6%
Pre- and Para- Clinical	67	39.4%
Total	170	100.0%

Figure 3: Distribution of field of specialization of the participants

60.6% of the respondents were from clinical field and 39.4% were from pre/para-clinical field.

Assessment of knowledge and awareness about medical research among study subjects

Table 5: Answer to the question- what is the highest level of evidence of available literatures?

Highest level of evidence of available literatures	Number	%
Case series	31	18.2%
Randomized control trials	139	81.8%
Total	170	100.0%

Figure 5: Answer to the question- what is the highest level of evidence of available literatures?

81.8% of the respondents answered correctly that randomized control trials are the highest level of evidence of available literatures which was significantly higher than that of the incorrect answer (18.2%) ($Z = 9.05$; $p < 0.0001$).

Table 6: Answer by the respondents regarding full form of MEDLINE

Full form of MEDLINE	Number	%
Medical literature analysis and retrieval system online	116	68.2%
Medical knowledge analysis and research system	54	31.8%
Total	170	100.0%

Figure 6: Answer by the respondents regarding full form of MEDLINE

68.2% of the respondents responded with correct answer which was significantly higher than that of incorrect answer (31.8%) ($Z = 5.09$; $p < 0.0001$).

Table 7: Answer by the respondents regarding method of estimation of confidence interval

What is estimated by confidence interval	Number	%
Standard deviation	106	62.4%
True value of an unknown population parameter	64	37.6%
Total	170	100.0%

Figure 7: Answer by the respondents regarding method of estimation of confidence interval

62.4% of the respondents responded with correct answer which was significantly higher than that of incorrect answer (37.6%) ($Z= 3.39$; $p<0.0001$).

Table 8: Answer by the respondents regarding authority responsible for approval of drug trials in India

Authority responsible for approval of drug trials in India	Number	%
Drug technical Advisory Board (DTAB)	94	55.3%
MCI	76	44.7%
Total	170	100.0%

Figure 8: Answer by the respondents regarding authority responsible for approval of drug trials in India

55.3% of the respondents responded with correct answer which was higher than that of incorrect answer but it was not significant (44.7%) ($Z= 1.41$; $p=0.16$).

Figure 9: Proportion of Correct Answers to the Knowledge Questions

Attitude towards Research:

Table 9: Answer by the respondents to the question- Should training for research methodology be made compulsory for PG students?

Should training for research methodology be made compulsory for PG students?	Number	%
Yes	155	91.2%
No	15	8.8%
Total	170	100.0%

Figure 10: Answer by the respondents to the question- Should training for research methodology be made compulsory for PG students?

91.2% of the respondents responded that training for research methodology should be made compulsory for PG students which were higher than those who disagreed. (8.8%) ($Z= 11.59$; $p<0.0001$).

Table 10: Answer by the respondents to the question- does undertaking of research caused increasing burden on already overworked doctors?

Does undertaking of research caused increasing burden on already overworked doctors?	Number	%
Yes	122	71.8%
No	48	28.2%
Total	170	100.0%

Yes	122	71.8%
No	48	28.2%
Total	170	100.0%

Figure 11: Answer by the respondents to the question- does undertaking of research caused increasing burden on already overworked doctors?

71.8% of the respondents felt that undertaking of research caused increasing burden on already overworked doctors which was significantly higher than those who did not agree to the statement. (28.2%) ($Z= 6.22$; $p<0.0001$).

Table 11: Distribution of answer by the respondent's whether undertaking of research caused increasing burden on already overworked doctors and the respondents of the two groups

Undertaking of research caused increasing burden on already overworked doctors	Clinical (n=103)	Pre- and Para-Clinical (n=67)	Total
Yes	81	41	122
Row %	66.4	33.6	100.0
Col %	78.6	61.2	71.8
No	22	26	48
Row %	45.8	54.2	100.0
Col %	21.4	38.8	28.2
TOTAL	103	67	170
Row %	60.6	39.4	100.0
Col %	100.0	100.0	100.0

$\chi^2=6.09$; $p=0.0135$ S-Significant

Chi-square (χ^2) test showed that there was a significant association among the respondents on the statement that undertaking of research caused increasing burden on already overworked doctors and the respondents of the two groups ($p=0.0135$). The proportion of clinicians (78.6%) with answer that research caused increasing burden on already overworked doctors was significantly higher than that of the pre-and para-clinicians (61.2%) ($Z=2.77$; $p=0.00054$).

Table 12: Answer by the respondents to the question - Will you be interested in carrying out research in future if it was not made compulsory?

Will you be interested in carrying out research in future if it was not made compulsory?	Number	%
Yes	114	67.1%
No	56	32.9%
Total	170	100.0%

Figure 12: Answer by the respondents to the question - Will you be interested in carrying out research in future if it was not made compulsory?

67.1% of the respondents said that they would be interested in carrying out research in future if it was not made compulsory which was significantly higher than that of the opinion for non-compulsion (32.9%) ($Z= 4.81$; $p<0.0001$).

Table 13: Distribution of answer by the respondents regarding interest in carrying out compulsory research in future and the respondents of the two groups

Interest in carrying out compulsory research in future.	Clinical (n=103)	Pre- and Para-Clinical (n=67)	Total
Yes	69	45	114
Row %	60.5	39.5	100.0
Col %	67.0	67.2	67.1
No	34	22	56
Row %	60.7	39.3	100.0
Col %	33.0	32.8	32.9
TOTAL	103	67	170
Row %	60.6	39.4	100.0
Col %	100.0	100.0	100.0

$\chi^2=0.0006$; $p=0.98$ NS-Not Significant

Chi-square (χ^2) test showed that there was no significant association among the respondents regarding interest in carrying out compulsory research in future and the respondents of the two groups ($p=0.98$).

Thus the answers were more or less equally distributed among the respondents of the two groups. However, the proportion of clinicians (67.0%) who had shown interest in carrying out compulsory research in future was lower than that of the pre-and para-clinicians (67.2%).

Table 14: Answer by the respondents to the question - should research time be allotted separately while planning PG curriculum?

Should research time be allotted separately while planning PG curriculum?	Number	%
Yes	164	96.5%
No	6	3.5%
Total	170	100.0%

Figure 13: Answer by the respondents to the question - should research time be allotted separately while planning PG curriculum?

96.5% of the respondents agreed that allocation of separate research time must be considered in planning PG curriculum which was significantly higher ($Z=13.29$; $p<0.0001$).

Figure 14: Proportion of Correct Answers to the Attitude Questions

Practices

Table 15: Answer by the respondents regarding willingness to participate in workshop on research methodology

Are you willing to participate in workshops on Research methodology?	Number	%
Yes	122	71.8%
No	48	28.2%
Total	170	100.0%

Figure 15: Answer by the respondents regarding willingness to participate in workshop on research methodology

71.8% of the respondents had shown willingness to participate in workshop on research methodology which was significantly higher than those who were not willing to participate in workshops (28.2%) ($Z=6.22$; $p<0.0001$).

Table 16: Answer by the respondents regarding research publication in any journal till date

Do you have any research publication in any journals till date	Number	%
Yes	24	14.1%
No	146	85.9%
Total	170	100.0%

Figure 16: Answer by the respondents regarding research publication in any journal till date

Only 14.1% of the respondents had authorship of research publication in any indexed journal till date.

Table 17: Distribution of answer by the respondents regarding authorship of research publication in any indexed journal till date and the respondents of the two groups

Authorship of research publication in any indexed journal till date	Clinical (n=103)	Pre- and Para-Clinical (n=67)	Total
Yes	12	12	24
Row %	50.0	50.0	100.0
Col %	11.7	17.9	14.1
No	91	55	146
Row %	62.3	37.7	100.0
Col %	88.3	82.1	85.9
TOTAL	103	67	170
Row %	60.6	39.4	100.0
Col %	100.0	100.0	100.0

$\chi^2=1.31$; $p=0.25$ NS-Not Significant

Chi-square (χ^2) test showed that there was no significant association with the respondents regarding authorship of research publication in any indexed journal till date and the respondents of the two groups ($p=0.25$).

The proportion of clinicians (11.7%) who had authorship of research publication in any indexed journal till date was lower than that of the pre-and para-clinicians (17.9%).

Table 18: Answer by the respondents regarding presentation of poster/research paper in a state/national conference

Have you presented poster/research paper in a state/national conference?	Number	%
Yes	32	18.8%
No	138	81.2%
Total	170	100.0%

Figure 17: Answer by the respondents regarding presentation of poster/research paper in a state/national conference

Only 18.8% of the respondents had presented any poster/research paper in a state/national conference.

Table 19: Distribution of answer by the respondents regarding presentation of poster/research paper in a state/national conference till date and the respondents of the two groups

Presentation of poster/research paper in a state/national conference till date	Clinical (n=103)	Pre- and Para- Clinical (n=67)	Total
Yes	21	11	32
Row %	65.6	34.4	100.0
Col %	20.4	16.4	18.8
No	82	56	138
Row %	59.4	40.6	100.0
Col %	79.6	83.6	81.2
TOTAL	103	67	170
Row %	60.6	39.4	100.0
Col %	100.0	100.0	100.0

$X^2=1.31$; $p=0.25$ NS- Not Significant

Chi-square (χ^2) test showed that there was no significant association among the respondents regarding presentation of poster/research paper in a state/national conference till date and the respondents of the two groups ($p=0.25$).

The proportion of clinicians (20.4%) had presentation of poster/research paper in a state/national conference till date was higher than that of the pre-and para-clinicians (16.4%).

Table 20: Answer by the respondents regarding experience of writing research paper/case report till date

Experience of writing research paper/case report till date	Number	%
Yes	94	55.3%
No	76	44.7%
Total	170	100.0%

Figure 18: Answer by the respondents regarding experience of writing research paper/case report till date

55.3% of the respondents had experience of writing research paper/case report till date which was significantly higher ($Z=1.41$; $p=0.16$).

Table 21: Distribution of answer by the respondents regarding experience of writing research paper/case report till date and the respondents of the two groups

Experience of writing research paper/case report till date	Clinical (n=103)	Pre- and Para- Clinical (n=67)	Total
Yes	51	43	94
Row %	54.3	45.7	100.0
Col %	49.5	64.2	55.3
No	52	24	76
Row %	68.4	31.6	100.0
Col %	50.5	35.8	44.7
TOTAL	103	67	170
Row %	60.6	39.4	100.0
Col %	100.0	100.0	100.0

$X^2=3.53$; $p=0.06$ NS- Not Significant

Chi-square (χ^2) test showed that there was no significant association among the respondents regarding experience of writing research paper/case report till date and the respondents of the two groups ($p=0.06$).

The proportion of clinicians (49.5%) who had experience of writing research paper/case report till date was lower than that of the pre-and para-clinicians (64.2%).

Figure 10: Proportion of Correct Answers to the Practices Questions

DISCUSSION

We tried to find in our study the level of awareness and knowledge of research among post-graduate doctors in Kolkata and whether the current methods of training and facilities are adequate to generate interest among students to do their post-graduation research. Measures that can be taken to promote research were also suggested. Our study showed various key findings that would be of interest to medical educators and policymakers.

In the present study the level of awareness, knowledge, attitudes of 170 post-graduate trainee doctors from the clinical and pre/para clinical specialty was evaluated, difficulties faced by them in conducting research, and suggestions on how research can be promoted among PG residents was taken.

Among the participants, the majority of the participants were age between 26 – 28 years. The majority of the participants were males. Out of the enrolled doctors, 60.6% were from clinical specialty and 39.4% from the para clinical specialty.

In regards to questions on knowledge & awareness, the majority of the respondents (mean knowledge score 66.9%) of both specialties answered most of the questions correctly. Thus most of the participants had adequate knowledge regarding research methodology.

In a similar study done by Moges T. et al. out of 345 residents, the mean Knowledge score was 34.6%. Pallamparthi S. et al. in their study, found that out of the 300 participants, about 70% of the participants showed adequate research knowledge. In a study done by Purushottam A. Giri et al. out of 116 participants, only 19.2% of the participants had adequate knowledge regarding research. In a study done by Dattaray P. et al., out of 100 participants, 60% of the participants showed adequate knowledge regarding research.

In the present study, the majority of respondents (91.2%) felt that training for research methodology should be made compulsory for PG students, out of these 89.3% residents were from clinical specialty and 94% were from the pre/para clinical specialty. 71.8% of the residents felt that undertaking research increases the burden on already overworked doctors. A higher proportion of residents from the clinical specialty felt that research caused an increasing burden on already overworked doctors. 67.1% of the respondents said that they would be interested in researching the future if it was not made compulsory. However, the proportion of clinicians (67.0%) who had shown interest in carrying out compulsory research in the future was lower than that of the pre-and para-clinicians (67.2%). 96.5% of the respondents agreed that the allocation of separate research time must be considered in planning the PG curriculum.

Thus although residents both clinical and para/pre-clinical felt that undertaking research increases the burden on overworked doctors, they showed a positive attitude towards researching if research time was allotted separately while planning the PG curriculum. They also suggested that research methodology should be included as a syllabus for PG students.

A study was done by Dattaray B. Pawar et al., also showed that resident doctors demonstrated fairly good knowledge and positive attitude toward research. Morges T. et al. found that Participants' attitude towards research was positive, but their knowledge of research made their practice inadequate. Two studies that were carried out in

Canada and Pakistan reflected a contrasting attitude of residents who felt that a majority of time in residency should be spent learning the clinical aspects of their specialty and they were unwilling to sacrifice personal time for research^{6,7}.

In the present study, 71.8% of the respondents showed a willingness to participate in workshops on research methodology. Although a majority of the postgraduate residents wished to get involved in research, very few had participated in research work, other than the mandatory dissertation project. Only 14.1% of the respondents had authorship of research publication in any indexed journal to date. The proportion of residents from the clinical specialty who had authorship in any research publication was lower than that of the pre-and para-clinicians.

In this study, only 18.8% of the respondents had presented any poster/research paper in a state/national conference. Out of these, 20.4% of residents from clinical and 16.4% from pre/paraclinical specialty had the presentation of poster/research paper. 55.3% of the respondents had the experience of writing research paper/case report to date. The proportion of clinicians who had the experience of writing research paper/case report to date was lower than that of the pre-and para-clinicians.

In a study by Dattatray B. Pawar et al., as low as 4% of the study participants had published articles and 28% had presented research papers at national conferences⁵. In another study done by Purushottam A. Giri et al. it was found that out of 116 postgraduate students, 61.2% students had previous experience of research projects, whereas 31.1% had presented papers at the institute, national, or international levels.⁴

CONCLUSION

The present study revealed that the residents from both clinical and para/clinical specialties had a fair knowledge about research. They had a positive attitude toward research, but they are unable to transform their knowledge and attitude into actual practices. Low research practices in the context of positive attitude may be due to various issues such as lack of time, lack of research curriculum, inadequate facilities for conducting research, inadequate support from mentors/ guides. Lower research output among clinical residents as compared to pre/para clinical residents may be attributed to long continuous duty hours giving them inadequate time to take part in research activities.

The medical council of India, the National Board of Examinations (NBE), and teaching hospitals should take the necessary measures to promote research. As lack of time due to clinical work was cited as the main obstacle by a majority of resident doctors, specific time for research should be allocated during post-graduate residency.

Positive attitude towards research has been a recurring finding in almost all studies from within and outside the country and gives hope that given further changes in the right direction the education scenario will see quality research work being taken up by doctors and the Indian contribution to literature and scientific discoveries will increase manifold.

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