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Knowledge and attitudes towards homeopathic research: the perspective of new graduates and postgraduate trainees – an Indian scenario

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Abstract

Background Homeopathic research conducted by new graduates [i.e. house staff (HS)] and postgraduate trainees (PGTs) in India remains seriously compromised.

Objective To assess HS and PGT knowledge and attitudes towards homeopathic research and to identify the barriers to conducting research.

Methods A cross-sectional survey was conducted in four government homeopathic schools in West Bengal, India. A total of 118 HS and 54 PGTs were interviewed using a validated and pilot-tested self-administered questionnaire. Bivariate analyses were performed to look for putative associations between different variables and the knowledge and attitude scores.

Results The survey response rate was 43%. Mean scores ± standard deviation on the knowledge and attitude scales were 31.35% ± 15.27 and 47.3% ± 18.2, respectively. There were no statistically significant differences between the knowledge (P=0.234) and attitude scores (P=0.304) of HS and PGTs. Males had significantly better knowledge of (P=0.020) and attitude towards (P=0.033) research in comparison with females. Constraints in infrastructure (23%), research training (20%) and statistical support (15%) were the major hurdles to pursuing research.

Conclusion Homeopathic HS and PGTs demonstrate inadequate knowledge, while having moderate attitudes towards research. Research training needs to undergo major transformation to encourage meaningful research.

Keywords

Homeopathy • India • new graduates • postgraduate trainees • research

Introduction

Research, the cornerstone of evidence-based practice, translates new knowledge and technological capability into powerful tools for prevention and treatment of disease. A basic understanding of statistical methodology is essential, both for designing quality research projects and for evaluating the medical literature.[1–5] Medical education provides only limited training in clinical research, and is often delivered by untrained mentors with poor formal research training or even informal experience.[6,7] A decline in the number of medical graduates pursuing a physician–scientist career,[8–10] as well as the drop in the number of research outputs in the last two decades,[11–13] substantiates the crisis.

Homeopathic research in India, like in most developing countries, is still in its infancy and faces several obstacles. With a few exceptions, there is little quality research; a large majority of this research is compromised due to flawed methodologies and the poor research training and background of researchers. Most of the research consists of papers generated by postgraduate trainees (PGTs) as a mandatory requirement of their training; these papers are seldom published in peer-reviewed journals. This is evident from the fact that, in the last decade from the four government homeopathic schools in West Bengal, no papers were published by PGTs, and only a single peer-reviewed paper was published[14] under the authorship of a member of the house staff (HS), although this journal was not indexed in a major medical database, nor did it have an impact factor.

Our evaluation aimed to gauge for the first time, homeopathic HS and PGT knowledge and attitudes towards homeopathic research activities and to obtain their personal views about the barriers to conducting research. This work hopes to further encourage research by young professionals so that future research in this area is more in number, better in quality and greater in impact.

Methods

Setting and design

A cross-sectional survey was carried out during August–September 2013 in four government homeopathic medical colleges of West Bengal, India; specifically, Midnapore Homeopathic Medical College and Hospital (MHMC&H), Calcutta Homeopathic Medical College and Hospital (CHMC&H), Mahesh Bhattacharyya Homeopathic Medical College and Hospital (MBHMC&H) and D N De Homeopathic Medical College and Hospital (DNDHMC&H). Permission was granted from the institutional ethics committees of each respective institution prior to conducting the study.

Participants

From a total of 118 HS and 54 PGTs working in the four homeopathic degree-granting colleges [under approval of the West Bengal University of Health Sciences (WBUHS), Government of West Bengal and through affiliation with the Central Council of Homeopathy, Government of India], a total of 106 (76 HS and 30 PGTs; 61.6%) participated in the study and returned the questionnaire, of which 74 (53 HS and 21 PGTs; 43%) were complete and analysable.

Considering a margin of error of 5%, a confidence level of 95%, a response distribution taken as 50% prevalence of good knowledge and attitude, and a population size of 172, the target sample size was determined to be 120. However, as we obtained only 74 complete analysable responses, the confidence level was reduced to 74%.

Questionnaire

No universally accepted standardised questionnaire was available to evaluate homeopathic new-graduate and post-graduate trainee perceptions of research. Hence, we used the pre-tested, validated, structured, self-administered questionnaire used by Vodopivec *et al.*[15] and Khan *et al.*[16] Instructions on how to complete the questionnaire were provided verbally to all students by the research assistants.

The questionnaire consisted of four sections. The first section sought demographic details of the respondents. The second section comprised of 10 closed-ended questions, each with multiple probable answers focusing on the respondents' knowledge of scientific research. The third section consisted of six closed-ended questions exploring the participants' attitudes towards research and each answer was scored on a scale of 0 (unfavourable response) to 1 (favourable response). The fourth section identified major barriers to research as perceived by the study participants by choosing from a list of options. To evaluate the feasibility of the questionnaire, a pilot test was conducted on 20 students, with five students from each institution, prior to the survey. The survey took only 5 min to complete. Instructions on the questionnaire promised anonymity. No participant identifiable information was required, thus protecting privacy. In addition, the completed questionnaires were concealed inside opaque envelopes, which were sealed at the survey site by the students themselves. All surveys were collected by the research assistants and were sent for data analysis.

Statistical analysis plan

All responses were individually extracted in a specially designed Microsoft Excel spreadsheets and subjected to statistical analysis using computational websites. Descriptive statistics were presented in the form of absolute numbers, percentages, mean values and standard deviations (SDs). One-way ANOVA and independent *t*-tests were performed to look for putative associations of gender, age, residence, presence of physician in family (if any) and type of respondents (HS or PGTs) with the knowledge and attitude scores. *P*-values less than 0.05 (two-tailed) were considered statistically significant.

Results

Of the 172 HS and PGTs approached, only 74 responses (response rate 43%) were obtained. Table 1 shows the number of participants in each group with respect to gender, age, residence, presence of physician in family (if any) and type of respondent (HS or PGTs). Of the respondents, 47 (63.5%) were male and 27 (36.5%) female. The majority of the respondents spanned the age group of 26–30 years (n=46; 62.2%). The mean age of the study sample was 27.27 years (SD=2.31). Mean score ± SD on the knowledge scale was 31.35% ± 15.27, and on the attitude scale, 47.3% ± 18.2.

The proportion of subjects scoring correctly on the knowledge questionnaire and the responses to the

Table 1 Demographic details of the survey respondents (*n*=74)

Items	*n* (%)
Gender	
Male	47 (63.5)
Female	27 (36.5)
Age (years)	
≤25	20 (27.0)
26–30	46 (62.2)
>30	8 (10.8)
Residence	
Urban	27 (36.5)
Semi-urban	31 (41.9)
Rural	16 (21.6)
Physician in family	
Yes	25 (33.8)
No	49 (66.2)
Respondents	
House staff	53 (71.6)
Postgraduate trainee	21 (28.4)

Table 2 Knowledge test – proportion of house staff and postgraduate trainees with correct answers to selected questions (*n*=74)

Questions	*n* (%)
1. Define scientific hypothesis correctly	32 (43.2)
2. Define scientific theory correctly	36 (48.6)
3. Define scientific truth correctly	7 (9.5)
4. Identify essential characteristic of science correctly	16 (21.6)
5. Identify ordinal scale correctly	26 (35.1)
6. Identify representativeness correctly as key characteristic of sample	21 (28.4)
7. Identify MEDLINE correctly as a medical database	6 (8.1)
8. Know checking citations from Science Citation Index database	30 (40.5)
9. Identify the acknowledgement section correctly as part of scientific paper	33 (44.6)
10. Identify correctly the exception of rules in writing an introduction	25 (33.8)

Table 3 Attitude test – house staff and postgraduate trainees' attitudes towards scientific research (*n*=74)

Statement	Yes *n* (%)	No *n* (%)	Undecided *n* (%)
1. Confident in interpreting and writing a research paper	48 (64.9)	16 (21.6)	10 (13.5)
2. Participation in a research project	23 (31.1)	51 (68.9)	0 (0)
3. Wrote a scientific paper	15 (20.3)	59 (79.7)	0 (0)
4. Students/trainees should participate in research	67 (90.5)	6 (8.1)	1 (1.4)
5. Students/trainees can plan and conduct a research project and write a scientific paper	51 (68.9)	11 (14.9)	12 (16.2)
6. Students/trainees can plan and conduct research project without supervision	6 (8.1)	64 (86.5)	4 (5.4)

attitude questions are shown in Tables 2 and 3, respectively. A considerable number of participants defined scientific theory correctly (*n*=36; 48.6%), identified the acknowledgement section as part of a scientific paper correctly (*n*=33; 44.6%), defined scientific hypothesis correctly (*n*=32; 43.2%), and knew how to check citations from Science Citation Index database (*n*=30; 40.5%). Strikingly, only six participants (8.1%) could correctly identify MEDLINE as a medical database and only seven (9.5%) could define scientific truth. While 48 participants (64.9%) felt confident in interpreting and writing a research paper, only 23 (31.1%) had participated in a research project, and only 15 (20.3%) had written a scientific paper. The majority (*n*=67; 90.5%) thought that students/trainees should participate in research, and a majority (*n*=51; 68.9%) preferred writing scientific papers by them, but under supervision (*n*=64; 86.5%).

Table 4 depicts the influence of variables on the knowledge and attitudes of respondents towards research. Males had significantly better knowledge of (34.47 ± 14.41 vs. 25.93 ± 15.22; t=2.372; P=0.020 two-tailed) and attitude toward (50.71 ± 20.34 vs. 41.35 ± 11.46; t=2.170; P=0.033 two-tailed) research in comparison with females. There were no significant differences found between knowledge (30 ± 15.05 vs. 34.76 ± 15.31; t=–1.212; P=0.234 two-tailed) and attitude (45.91 ± 18.86 vs. 50.79 ± 15.85; t=–1.129; P=0.304 two-tailed) scores of HS and PGTs. Other variables did not seem to influence knowledge and attitude scores significantly (P>0.05).

The barriers to pursuing research are summarised in Figure 1. The most commonly reported barriers were constraints in infrastructure (*n*=17; 23%), research training (*n*=15; 20%), statistical support (*n*=11; 15%), financial incentives (*n*=10; 14%), mentorship (*n*=7; 10%), funding (*n*=6; 8%), research-allotted time (*n*=4; 5%) and uncertainty about future benefits (*n*=4; 5%).

Discussion

This study found an unsatisfactory, rather poor level of knowledge about scientific research (mean score 31.35%) among homeopathic HS and PGTs in government homeopathic schools in West Bengal, India. They fared comparatively better on the attitude score (mean 47.3%). There were no differences observed between the knowledge and attitude scores of HS and

Table 4 Variables of knowledge and attitudes towards research (*n*=74)

	Knowledge Mean ± SD	*P*-value	Attitudes Mean ± SD	*P*-value
Gender[a]				
Male	34.47 ± 14.41	0.020*	50.71 ± 20.34	0.033*
Female	25.93 ± 15.22		41.35 ± 11.46	
Age (years)[b]				
≤25	31.5 ± 15.58	0.876	50.83 ± 14.43	0.456
26–30	31.74 ± 14.94		46.74 ± 19.55	
>30	28.75 ± 16.15		41.68 ± 16.66	
Residence[b]				
Urban	32.22 ± 12.57	0.926	43.21 ± 19.39	0.154
Semi-urban	30.65 ± 15.64		47.30 ± 14.11	
Rural	31.25 ± 18.33		54.17 ± 20.84	
Physician in family[a]				
Yes	33.6 ± 14.39	0.373	47.33 ± 18.68	0.991
No	30.20 ± 15.58		47.28 ± 17.93	
Respondents[a]				
HS	30 ± 15.05	0.234	45.91 ± 18.86	0.304
PGTs	34.76 ± 15.31		50.79 ± 15.85	

[a]Independent *t*-test.
[b]One way ANOVA; *$P<0.05$ (two-tailed) considered statistically significant.
HS, house staff; PGTs, postgraduate trainees; SD, standard deviation.

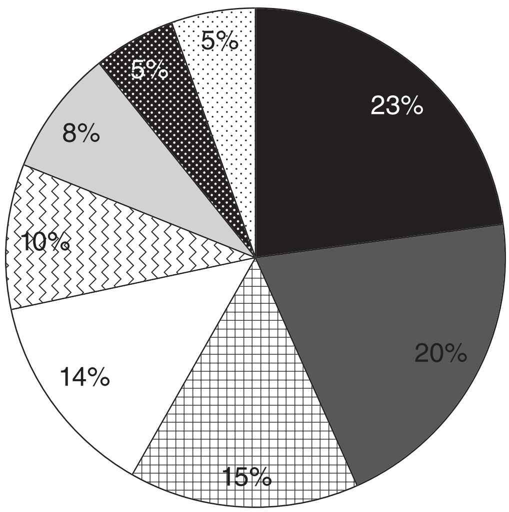

Figure 1 Pie chart showing major barriers to research as perceived by the homeopathic house staff and postgraduate trainees (*n*=74). ■ Lack of infrastructure; ⊞ lack of statistical support; ⧖ lack of mentorship; ▩ lack of research-allotted time; ■ lack of training; □ lack of financial incentives; □ lack of funding; ⬚ uncertainty about future benefits.

PGTs, clearly indicating poor research output even after obtaining a higher qualification. These scores overall reflect grave inadequacies of research training at homeopathic schools across the state. Identifying lack of infrastructure, research training and statistical support as major hindrances to pursuing research further highlights the crisis.

To the best of our knowledge, this was the first endeavour to assess knowledge and attitudes towards research of homeopathic HS and PGTs in India. We also tried to identify the major barriers to the successful conduct of research as perceived by survey participants. But, this cross-sectional survey did not allow us to draw causative conclusions. Moreover, constraints in achieving the desired sample size made the study underpowered, thus making the results less generalisable to the entire population across India. Additionally, the inevitable incorporation of central tendency bias and acquiescence bias arising from the use of Likert-scale responses cannot be eliminated.

The findings of our study corroborate the findings of Vodopivec *et al.*[15] and Khan *et al.*;[16] that is, participants had poor knowledge scores but comparatively higher attitude scores. Hren *et al.* also note that medical students generally have a positive attitude towards science and scientific research.[17]

Physicians who undertook extracurricular research at medical school produced four times as many publications as their peers.[18] Evidence shows that most medical students can generate scholarly work during medical school and sustain a high level of interest in research as a career option.[19] Those students not considering research careers may nevertheless develop skills transferable to clinical practice. In particular, medical student research may help instil a culture of EBM in clinical medicine.[20]

To strengthen the 'Research oriented medical education' in India, a variety of strategies like the Undergraduate Medical Students' Research Conference, ICMR short training internship, Kishore Vaigyanik Prosthan Yojana (KVPY), Indian Forum for Medical Student Research (INFORMER), Medical Scientist Training Program (MSTP) and Student Journals were commenced to make research more interesting among conventional medical graduates.[21,22] Some medical schools have developed student-oriented courses and programmes to overcome the perceived difficulties and improve the quality of theses and to promote their publication.[23,24] In comparison, our initiatives remained poor and performance extremely dismal and not even worth mentioning. The main reason may be that the majority of the faculty lacks experience in research. As such, students are not exposed to dedicated role models and, hence, a vicious cycle of a non-experimental approach towards science is set up. These factors, combined with the uncertainty of research funding, make a career in research less attractive economically.

Our curriculum includes introductions to the principles of scientific research, the retrieval of medical literature and data analysis. Despite this, many students still could not understand the process of scientific writing. It is important to teach PGTs the full scientific publishing process, including the peer-review process, the format for scientific articles and the necessary skills in word processing. Requiring students to write their theses according to the guidelines of a few selected journals, improving the supervisor's engagement in reporting, and improving students' understanding of the peer-review process could add a new dimension to the thesis process and provide additional opportunities for publication. The full digital text of the completed and reviewed thesis should be made visible and accessible in the institutions' archive.[25]

It has been shown that performing research allows students to gain critical thinking skills, an ability to evaluate literature, engage in teamwork, gain experience in writing and practice communicating data with the scientific field.[26] Conducting medical research also has several benefits, including improving a student's ability to interpret the scientific literature critically when working as physicians, increasing the potential number of scientists pursuing medical research, and improving independent analytical problem-solving skills.[26,27]

There are a range of existing strategies to encourage students to participate in research projects, like encouraging students with prior research experience or a research-oriented approach, curricular flexibility allowing students to take research leave, tuition remission and scholarships, dispensing academic credits, honours or awards for successfully completing research, training of research guides, targeting projects to the interests of individual students and integrating research activities with clinical applications.[28,29] We recommend addressing the gaps and barriers identified by participants in this study through the use of effective interventions. Gender differences in research involvement also needs attention.

Teaching and training in research should be made compulsory during undergraduate as well as postgraduate studies. Homeopathic schools need to analyse current practices of teaching–learning and research, and reflect upon possible changes needed to develop a 'student-focused teaching–learning and research culture'.[29] It is quite feasible to integrate teaching with real-world research.[4] This 'teaching–research nexus' should be central to homeopathic education.

A recent review conducted by Bierer and Chen has shown that engaging in research projects can influence a student's choice of clinical specialty or interest in research.[30] The Continuous Research Education and Training Exercises (CREATE) programme has been proposed as a peer- and group-based, interactive, analytical, customised and accrediting programme with didactic, training, mentoring, administrative and professional support to enhance clinical research knowledge and skills among healthcare professionals, promote the generation of original research projects, increase the chances of their successful completion and optimise the potential for their meaningful impact.[31]

Conclusions

Further detailed research is urgently needed at the national level to formulate corrective measures. Similar surveys need to be replicated from time to time to assess the efficacy of intervention programmes.

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Conflict of interest None declared.

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