July 2012

Interventions for improving research productivity in clinical radiology

Waseem Akhtar
Aga Khan University

Mubashir Aslam Arain
University of Sheffield

Arif Ali
Dow University of Health Sciences

Zafar Sajjad
Aga Khan University

SHORT COMMUNICATION

Interventions for Improving Research Productivity in Clinical Radiology

Waseem Akhtar[1], Mubashir Aslam Arain[2], Arif Ali[3] and Zafar Sajjad[1]

ABSTRACT

The purpose of this study was to evaluate the effects of research promotion activities on overall quality and quantity of research output in a clinical department of a teaching tertiary care hospital. Simple research enhancing strategies including regular journal club, research hour, basic research skills training, hiring of research faculty, research awards, and annual research retreat and research board to increase research production were implemented in the Department of Radiology of a teaching hospital in Pakistan. A total of 77 papers were produced by the Department of Radiology before the intervention, which increased to 92 after the introduction of research initiatives. There was a significant increase in the overall proportion of publications in the international journals after the intervention ($p < 0.001$) with an increasing trend towards indexed journals ($p < 0.001$). The research enhancing interventions had a positive effect on increasing clinical research output by the Department of Radiology. Such interventions can also be replicated in other clinical departments to increase their research productivity.

Key words: *Radiology. Pakistan. Research initiatives. Research productivity.*

Research training at higher education level and for clinical staff is important and there are possible ways to introduce research culture in employees at clinical departmental level. This may include conducting research methodology workshops, incentives for producing research papers, advance training and scholarships for selected employees etc. However, these initiatives have not been evaluated for their magnitude of effect in increasing research production. Academic clinical research is a relatively new field, received increasing attention since 1980s.[1] Hence, such interventions need to be evaluated to create a role model which can be implemented in other academic areas for enhancing research activities. One research has shown minimal research output from a clinical radiology department in a developing country.[2] Therefore, we targetted a radiology department to implement a pilot program consisting of a number of research related activities to encourage research awareness and research output. A pilot research program with simple initiatives in the available resources was implemented in Department of Radiology of the Aga Khan University Hospital.

[1] *Department of Radiology, The Aga Khan University Hospital, Karachi.*
[2] *Department of Research and Related Sciences, University of Sheffield, UK.*
[3] *Department of Research, Dow University of Health Sciences, Karachi.*

Correspondence: *Dr. Waseem Akhtar, Department of Radiology, The Aga Khan University Hospital, Stadium Road, Karachi. E-mail: waseem.mirza@aku.edu*

Received June 04, 2011; accepted May 19, 2012.

Components of the pilot research initiative program included formation of departmental research committee to promote and facilitate research activities in the department under the supervision of radiology chair with representation from faculty, residents and technologists, academic offs (time for research activities) for faculty, regular journal club, research hour, basic research skills training for all clinical employees, hiring of research faculty, research awards, annual research retreat and research board for communication and display of publications. The research committee meeting is held once in a month to discuss the problems and their solutions related to research. The primary goals of this committee were to promote research culture, forum for the exchange of ideas, encourage collaboration between staff, guide and facilitate staff, share doable research themes and ideas, identify and disseminate funding opportunities. Further, the committee, as its main objectives, evaluates quality of research conducted by the department and determines opportunities for further research. This committee was also responsible to attach elective students and residents with the radiology faculty in their research projects as support.

Radiologists, residents and technologists have been integrated into both the design and the implementation of the research program. Output was measured in terms of the increase in the number of publications and quality of publications (publications in indexed journal or journal of international repute). Data was entered and analyzed in Statistical Package for Social Sciences (SPSS) version 17; McNemar test was applied to test statistical significance at 95% confidence level. A total of

Table I: Clinical research output by the Department of Radiology before and after the pilot research enhancing program.

Variables	Research productivity				*p-values
	Before initiative		After initiative		
	N	%	N	%	
Article type					NS
Original	31	40.3	35	38.0	
Other	46	59.7	57	62.0	
Journal type					< 0.001
National	70	90.9	78	84.8	
International	7	9.1	14	15.2	
Status of journal					< 0.001
Indexed	54	70.1	60	65.2	
Non-indexed	23	29.9	32	34.8	
Funding proposals	02	15.3	11	84.6	NA
Research grants	00	00.0	02	100	NA
Paper/poster presentation in scientific meetings	53	37.58	88	62.41	NA
Prize/honours for scholarly achievements	05	41.66	07	58.33	NA

**McNemar Test; NS = Not statistically significant; NA = Not applicable.*

77 papers were produced by the radiology department before the intervention period, which increased to 92 in the following post-interventional period after implementing the specified research related initiatives for increasing research productivity. Original research articles were 31 in the year before intervention which rose to 35 in the following years. On the other hand, other article types such as case reports, review papers and editorials were also increased to 57 in the years after the intervention from 46 in the year before the intervention. In addition, it was revealed that the publications in international journals doubled (n=14) in the year after intervention as compared to the years before (n=7). Publications in the national journals also increased to 78 in the year after intervention from 70 in the previous year. Thus, there was a significant increase in the overall proportion of publications in the international journals before and after the intervention ($p < 0.001$). However, higher proportion of increased research papers were published in non-indexed journals (Table I). Funding proposals drastically increased from 2 submitted research proposals for funding in the previous years before intervention to 11 proposals in the years after intervention, though only 2 grants were approved out of the 11 while none were approved before the interventions. Therefore, success rate of funding proposals for grant application was also increased. Number of paper presentations at national or international meetings increased to 88 from 53 after implementing research increasing interventions and prize achievement were also slightly increased from 5 in the previous period to 7 in post-interventions period. These results show small increase in the production of original articles but a sizeable increase in the overall publications including letters to the editor, case reports, review articles etc. This emphasize the fact that such programs may not target the quick increase in original research but by creating research culture it can promote output in other research areas which are also important. However, in this study, grant applications were shown to be increased in the following years after interventions. This is encouraging because it is evident from other studies that increase in the funding resources directly influence increase in research output.[3-5] Thus, significant rise in original research may also be visible over the longer period of time.

Hence, it can be confidently reported that this pilot program was successful and achieved its goal within a short period of time and with limited resources. However, research quality still needs further attention to produce high quality research in future. This will help in improving current departmental and clinical practices through evidences generated by local research. Yet policy makers and health authorities need to understand the relationship between better health services delivery and high quality clinical research production so that these kind of research activity programs can be implemented.

There were some limitations of the study which needs to be understood for interpreting the results of this study. The pilot research increasing program reported in this paper was implemented in one department, the department of radiology, though interventions were non-specific to any specialties and could be implemented in any clinical department. Secondly, it can be noticed that each of the research increasing activity mentioned can be implemented and may produce good results. However, relationship of individual interventions with increase in the research output cannot be determined by this study. Thus, we recommend the implementation of all the components as a complete program to achieve appreciating results.

REFERENCES

1. Teo AR. The development of clinical research training: past history and current trends in the United States. *Acad Med* 2009; **84**:433-8.
2. Akhtar W, Ali. A, Aslam M, Gul-e-khanda. Clinical radiology research in Pakistan: From evidence to practice. *J Pak Med Assoc* 2009; **59**:544-6.
3. Ebbert JO, Montori VM, Schultz HJ. The journal club in postgraduate medical education: a systematic review. *Med Teach* 2001; **23**:455-61.
4. Akhund S, Kadir MM. Do community medicine residency trainees learn through journal club? An experience from a developing country. *BMC Med Educ* 2006; **6**:43.
5. Makris GC, Spanos A, Rafailidis PI, Falagas ME. Increasing contribution of China in modern biomedical research: statistical data from ISI Web of Knowledge. *Med Sci Monit* 2009; **15**:SR15-21.