EDITORIAL

RESEARCH CREATIVITY

Haider A. Naqvi[1]
[1]*Head of Psychiatry Department, Ziauddin University, Karachi*

It is common place to assess research productivity through citation index, impact factor or the number of publications. These are contentious parameters to quantify research creativity. Individuals are generally aware of the impact of their research in the domain of policy and practice. However, the various avenues of research dissemination and marketing of products have made the matters complicated. As one advances through his professional research-career one moves on to robust methodology (including research design) based on the research question and epidemiological acumen.

Introspection, reading, observation and discussion generally lead to fruitful conception. Though it may be normal to be dormant for a while, the cycle of creativity has to continue. Though we can teach individual (through training) how to think and write better, nobody can teacher you how to think or write (in its primal sense). It is in the process of practice that one realized the 'how' part. The creative ideas come naturally to some, while to most, they have to labor to think and write. In order to maintain originality (of idea), one has to be free to preconceived notions.

It is important to understand the process of conversion of creative ideas into research questions, which can be answered with a help of epidemiological research. Through literature search, discussion with experts and participating in the scientific activities (like conferences and poster competitions) help individuals identify the known and the unknowns in a field.[1] A good research question needs to have three characteristics. Firstly a thought experiment of ''what next'' is important. If this question is answered then it help in identifying the importance of the question from the end-user perspective.[1] Secondly a research question needs to be feasible, interesting, novel, ethical and relevant to health problems of a country.[2] Finally the research question should explicitly communicate the population about which the question is asked, exposure or intervention, control group and the outcome under study. Much of the research plan, including selection of the study design, becomes clear when the research questions is clear.

The ultimate objective of a research question is to establish causality. The traditional Sir Bradford Hill's criteria to establish causality has undergone much criticism.[3]We explain causality by understanding the concepts of sufficient cause model and hypothetical counterfactual situations.[4] Under the sufficient cause model a sufficient cause is ''complete causal mechanism or a minimal set of conditions and events that are sufficient for the outcome to occur.''[5] Therefore the cause of an outcome may be one or more than one. When we are interested in studying the association or effect of one exposure on the outcome, we need to take into consideration the presence of other factors that are associated both with the exposure and the outcome, as these factors would confound our findings. To tease out the effect of a confounder variable a control group is chosen to emulate a hypothetical counterfactual situation. Further identification of the covariates that can confound the results is possible through causal diagrams.[5] To establish causality we need to rule out the possibility of association because of chance, bias, confounder and reverse causality.[3]

It is common place to see people select an area of research and focus their effort in answering research questions. This leads us to the debate whether theory precedes the methods or vice versa. In order to conduct an impactful research one needs to have sufficient understanding of the research methods as well as have a sound understanding of the theory. Without sufficient subject knowledge all research would just give us some numbers without any contextual interpretation. On the other hand without adequate research insight a person will have a mind full of wonderful research questions but would not have the ability to scientifically answer the question.

The traditional model of bed side clinical observation has its centrality in generating creative research ideas. This is followed by cross sectional study looking at the outcome and the exposure variables. The basic problem is that one cannot interpret causality between an outcome and risk factor with the cross sectional studies (alone) and reverse causality cannot be ruled out since time sequence (temporality) cannot be established. However one can very well look at the association of an outcome with multiple risk factors. Case control studies (CCSs) offer the advantage of studying rare disease without spending much time and resources. A longitudinal cohort will not only be time consuming but also costly to answer similar questions. Case control study is suited to study a rare outcome.[6]In case control study one identifies a case and then selects an appropriate control (group) to study the differential distribution of exposure between the two groups. Higher odds ratio of exposure in cases than controls makes the case of exposure as a risk factor, while lower odds ratio as a protective factor. The Achilles heel in the case control study is selection of controls. There are various factors which need to be considered in the selection of controls: controls have to be similar to cases in important prognostics factors, which make the case for (individual or group) matching in matched case control design. Additionally controls have to be form similar population from which cases were picked. Their level of exposure needs to be similar to cases, in terms of population from which they were selected. A hospital based cases should have hospital based cases, provided they represent the same population or a community based control if the catchment area of the hospital is well defined. An affluent tertiary care hospital, where access is limited due to cost or travel-distance, will not be representative of the population if the controls were to be selected randomly from the population. Despite these factors case control studies offer strong association, in terms of design, for answering creatively posed research questions.

The next best option, in terms of design, is cohort study which identifies a group of individuals and looks to classify them according to their exposure status. A cohort of individuals is followed for a specified duration in order to see who develops