

Point of entry into Research - Problem orientation

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Abstract

A prerequisite for scientific research is the possession of a well-developed body of knowledge. Knowledge can be obtained from either traditional wisdom or scientific disciplines. Traditional sources of information usually lack any standardized authenticity checks. The main magical point about scientific facts is that they demand empiric evidence: even if traditional wisdom has empirical evidence it is a part of scientific knowledge. The scientific acquisition of knowledge follows certain predetermined steps of research with a starting point of identification and definition of the problem statement. From this article onwards we will try to gradually build up a thorough understanding of those steps (JPMA 50:279, 2000).

7.55 am in the morning. There is complete silence in the O.P.D area. Doors open and all of a sudden a large crowd of patients starts pouring in. By 9.00 a.m. the area is bustling with patients. In all this hustle bustle, suddenly a patient starts a loud argument with the receptionist “I have been waiting here for the last 4 hours. Is there nobody to care for the poor patients?”. Inside in the O.P.D cabin, the doctor is dedicatedly busy teaching a bunch of students. He has to regurgitate it on patients and students that he studied last night in preparation for his postgraduate exam. He is going to take another 30 minutes on the same patient, the nurse thinks. So she goes for a short socializing visit to her colleagues in the pediatric ward. When she reaches there, a child is crying loudly for “doctor uncle”, his favorite resident. Standing nearby the portable X-ray technician wonders why new doctors allow patients to become so attached to them. He quickly rushes to the medical ward for an emergency call, where on the bedside a doctor is pondering why he is getting the 7th consecutive patient in the last 4 days in a semi unconscious state, with high grade fever and bluish spots scattered all over the body. In a worried state he opens a window to get fresh air. He is surprised to find a demented old lady on a wheel chair in the lawn. She was admitted with severe pneumonia. Now she is cured but nobody has come to take her back home. The address mentioned on her admission paper was fake. Probably it is a typical hospital day. Full of never-ending amusing and sobering situations. There is so much to wonder every moment of the day around us. There is so much to explore. Even with all this, when medical professionals are asked about their research pursuits, they respond simply with a blank expression on their faces. How to remove such an expression? Whenever you analyze a situation, you will notice that it is pragmatic and relative in terms of its description. The above mentioned description of the situation would be different given by a psychologist, sociologist, anthropologist, physician or bio-ethist. It is because they are trained in different disciplines of knowledge, they have a clearer understanding of that particular aspect. Even in interdisciplinary research, a main investigator’s own discipline of knowledge, forms the pivot for other related disciplines. It is like an umbrella, where there is one main structure, which holds the entire fabric together. That background of a specific discipline enables a researcher to identify what are the deficient aspects of the discipline, which need to be explored.

Moral: Research topics are specialty areas or concepts in a discipline of knowledge that contain countless potential researchable problems.

Scientific inquiry is a process of organizing scattered facts into a highly structured form, curbed

and verified by certain pre-decided rules and ethics of inquiry. One can conclude that the ultimate aim of scientific research in medicine is to satisfy curiosity and prediction of desirable outcome.

Diverse sources of information are available, careful extensive background knowledge should be developed consciously or unconsciously, before formally taking on a research project.

Traditionally, the external realities of the world can be approached in the following manner:

Intuition is a philosophical doctrine, which means the perception of external objects by instant insight without the conscious use of reasoning¹. It is a gut feeling, which helps us to anticipate or presume connections in a phenomenon. Whatever the explanation may be, rarely but definitely intuitively we are able to open the window of opportunity to the disciplines of knowledge. It is like passing through a corridor of closed doors and one just has a strong feeling that if one opens a particular door, one will find something behind it.

One day Sir Isaac Newton was walking in the garden of his home. As he walked past an apple tree, he saw an apple fall. Downwards, it fell perpendicularly to the ground. It didn't go sideward or upwards. It fell straight down. This sight of a mere everyday common phenomena gave birth to the hypothesis of Universal Gravitation². (It should be interesting to note at this point, that contrary to popular belief, there is no evidence that the apple fell on Newton's head and enlightened it).

Sometimes repeated failures of the anticipated relationship in the phenomenon can also help us to increase our pool of knowledge. This process of deductive reasoning or elimination is also a source of gaining knowledge. Such trial and error experiences contribute significantly to our day to day learning. However, a very small group of individuals usually share such a pool of knowledge. Secondly it is inherently inefficient in terms of utility of resources.

In prehistoric times, human beings used hands for fishing. Resulting in very few catches after spending a lot of time and ending with very tired hands. Then, through a prolonged process of trying spears, arrows, and different fishing gears, now they can catch of tons of fish in a matter of hours³. But to reach this advanced stage took thousands of years.

Traditionally educational authorities like Scholars, Ustads or Gurus are also seen as authentic sources of knowledge. In societies where reading and writing skills are not valued much, such resource persons are great sources of preservation and then dissemination of knowledge. This is particularly true for eastern societies where critical appraisal of information is not considered to be a much-appreciated practice. Even asking questions to assess the validity of information is considered a sign of disrespect and a challenge to the authority. Such "blind faith" limits generations of new knowledge in society and sometimes erroneous values are transferred from generation to generation.

The harmony among body components of blood, phlegm, yellow and black bile results in Health State and disharmony produces Sickness state⁴. This misguided theory of medicine was accepted and endured for about 2500 years. It was not possible to challenge the father of medicine - Hippocrates.

Culture and tradition also give us valuable information especially about what is right or wrong and acceptable. It is shaped after centuries of sculpturing of societal experiences. Furthermore they are mainly influenced by religious, psychological, social and economic needs of the time. As such wisdom is meaningful constituent of identification of communities and society, sometimes they are much sensitive to when the information is challenged for verification. Such psychoemotional attachment to the knowledge also barred us from critical thinking regarding truth evaluation.

In various cultures it is a common practice to develop a divinational explanations to human sufferings. Such understanding is developed to maintain a self-integrity and sense of available support⁵.

Girls come by themselves, boys have to be asked for Indian proverb⁶.

The conventional source of wisdom are valued and appreciated in their specific context but we can't make them acceptable universally as ultimate truth because this knowledge is not evaluated by standardized criteria. On the contrary, scientific knowledge has a built-in evaluation system, so contrary to other sources it's self-correction system is more dynamic and receptive to change. More objective evidence is required as compared to personal differences and other limitations. Furthermore due to uniform evaluation norms the finding acceptability is relatively generalizable. Another important feature of scientific knowledge is that it depends upon empirical evidence while other sources are mostly interested in whimsical or metaphysical explanations. Scientific knowledge is acquired by keeping in mind certain fundamental assumptions. Without understanding and belief in these assumptions, it could be any thing but scientific approach to knowledge.

- To explore the order of the nature, predetermined process guidelines (scientific approach) is required.

- The doctrine of determinism assumes that there is cause and effect relationship for every physical and social event. This relationship is more acceptable as pluralistic concept as compared to unitary one. As phenomenon is occurring in a system, there is a mutual interaction among phenomenon to influence the outcome.

- To give objectivity to the scientific approach only sensory based evidence (empiricism) is acceptable to explore and establish the relationship of the phenomenon.

Moral (dilemma): Assumptions are basic principles that are supposed to be true, with out a need for scientific proof.

The scientific knowledge in medicine is acquired by following certain predetermined sequential steps of research. However the process of can be elaborated according to specific nature of the study.

- Problem statement: focussing on research topic to the extent that it become narrower, clearer and refined to a degree that it becomes a feasible research question, along with clear vision of beneficence and other reasons to study.

- Hypothesis: a relational statement among the concepts in the phenomenon of interest. It should be predetermined whether the study is aimed at developing the hypothesis or to test one that has already been developed. It is important to rationalize this so that the content and direction of data collection is justified.

- Research design: appropriate data collection technique or roadmap is determined on the basis of requirement of type of hypothesis. Characteristics of data collection instrument and most importantly available resources.

- **Data:** scrutinized, analyzed and interpreted in a manner that it can answer the research questions. It requires of not only in-depth understanding of research concepts, but also a clear vision of proposed study and related knowledge of the discipline.

- **Conclusion:** a summary statement is produced as result of the study, which should add to the body of medical knowledge academically and practically.

These steps should not be considered as recipe from a 5-minute cookbook or an oversimplified easy way out kind of a solution to the research. Rather they are blueprints on which with creative and critical thinking modifications are made, which makes every study unique in terms of its

research process.

Moral: Why should we subsidize intellectual curiosity Ronald Reagan

The first step of the research process, i.e. identification and development of research problem, demands that considerable amount of time should be spent upon them. As a matter of fact most of the time it is a prolonged step, which includes conscious and unconscious, intellectual and physical effort and is required to develop a researchable problem to pursue. Research problem is an issue in the topic of research interest, which needs clarification and solution. It is important that research problem should be put down formally in writing from the start, so that investigator remains focussed. There are numerous valid sources in the medical profession, which help in providing background material for the problem statement.

Personal experience is the most autocratic and motivating source for the research problem.

During professional practice, several questions arise in the mind, why I am doing this ritual?

What should I do now? . Such thought provoking questions keep you oriented towards the need

of further research in your desired discipline. Try to maintain a diary of your research ideas and have frequent interactions with colleagues and experts. It will help to uncloak the errors in reasoning, detect lack of available information and especially help to generate new dimension of your novice idea. It is also possible that you will find some like-minded colleagues to support your project. Now that you have enough confidence, take a systemic effort of organizing your knowledge by literature review. It will help you to estimate the distance between known and unknown. In this way you will find out specific suggestions and recommendations of the previous studies, also able to uncover the contradictory results of previous research. You may end up replicating one of those studies either to ensure that findings are valid in your setting or to challenge those findings. Literature review also informs you about possible related research methodologies and tools. It is important to maintain the index of the reviewed literature, it will be required till the research is completed and published. Personal intellectual and scientific aptitudes also make us comfortable with certain specific research issues. Usually at this point we are ready to enter the next stage which is problem solving. In modern times, professional competition focus to develop our expertise on very specific and narrow issues, such source of problem tapping is usually influenced by trends prevailed at the national and international level in research rather than problem faced by the immediate surroundings. Furthermore, in certain institutions research requirement for promotion, sometimes forces researchers to take very shallow research endeavors just to maintain their professional competitiveness.

Moral: Daring ideas are like chessmen move forward, they may be beaten, but they may start a winning game _____ Goethe.

The important task is to evaluate a research problem that is it practical and valuable to carry out study on this problem: researchability and feasibility of the venture. Researchability of the problem has a foremost concern for the research.

- Is the work environment supportive for learning of postgraduate trainee doctors in this hospital?

- How many postgraduate trainee doctors are in this hospital?

The first statement is measurable by the empirical data and there is a relationship between two well defined variables, so it is feasible for the scientific research. The second statement is representative of a routine counting process rather than scientific research process.

Feasibility of the problem could be assessed by numerous parameters. Does the investigator sufficient time to complete all the activities related to the research?. Timing of the project should be congruent with the research problem e.g.. it is more feasible to find out malaria patient in the rainy season. Support and cooperation of colleagues is important because medical research can't

be a one man show, it is always teamwork. Organizational approval and sufficient availability of willing study subjects to participate in the study should be valued. Background of the researcher in terms of knowledge of the research concepts and research topic. Ethical values should be duly considered and not be taken superficially, especially when you are dealing with human subjects. Funding for research has always been of fundamental importance. Practically this factor usually decides whether the project will take off the ground at all and how far you can take the project. There are numerous research-related expenditures, which are usually not foreseen by even experienced researchers. Finally most important concern would be that the anticipated research funding are more beneficial than the amount of anticipated expenditure.

Moral: If ye had not ploughed with heifer, ye had not found out my riddle Bible

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