Editorial

Research Thinking in Medical Profession

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Thinking can simply be viewed as, generating your thoughts on anything, and reviewing these till you comprehend it at some minimum level.[1] Thinking is the most powerful attribute of a human being. In our daily life or even in professional work settings, most of the time our thinking remains limited to others' ideas or already known facts and it is enough well to carry out our work in a "by default" pattern. While working in a clinical setup we daily confront many disease conditions, and we generally accept and deal with the whole course of illnesses under our memorized knowledge. Our mind is ready to see or accept all pathophysiologic & clinical events of a given disease, management modalities, treatment outcomes, and the complications, as they had been reported or taught and not anything in between. We don't notice or concentrate on why any variability or difference happening beyond reasons we have learned through our training. This is good enough to run routine practices. But a problem, or a worse happening, costing human suffering or life, need little "thinking" on "why" of it, specifically if it is not explained previously. Any visible variability or event has a set of many underlying sub-events or connections which were linked to eventually produce an apparent happening. The primary act of a researcher's mind is to notice the varied happening and the job is to theorize its reasons, testify the assumed theory under applicable scientific methods, and infer based on identified facts. Knowledge is floating behind any unexplained thing or such visible phenomenon; it just needs taking notice of it and "thinking" on 'why & how" of it. Here it would be relevant to recall the saying of a great Nobel laureate Albert Szent-Gyorgyi (medicine 1937) that "Research is to see what everybody else has seen, and to think what nobody else has thought." This would be the beginning of research thinking. Research thinking is not a one-moment process, rather a start of a chain of connected thoughts which demands more and more reviews and some actions too, till you reach some workable idea or hypothesis. Initially, your thinking may have many intuitive, fictional, or irrational elements but as you move forward, you become more & more pragmatic, and your construct follows scientific rules. Initially, your conceptualized construct may have some ridiculous postulates but actually, you are making efforts towards a way to produce controlled evidence for them. That is the practical pathway of the research. It is your intuitiveness or dreaming capacity with which you connect things uniquely or differently to explain a problem or happening which is the real essence of research. Here measures like deep reading on that particular issue, exploring historical purview, talking to fellows, or even conducting small experiments, help a lot to refine and improve your initial theory or construct. "I find for myself that my first thought is never my best thought. My first thought is always someone else's; it's always what I've already heard about the subject, always the conventional wisdom. It is only by concentrating, sticking to the question, being patient, letting all the parts of my mind come into play, that I arrive at an original idea. By giving my brain chances to make associations, draw connections, take me by surprise". And often even that idea doesn't turn out to be very good. I need time to think about it, too, to make mistakes and recognize them, to make false starts and correct them, to outlast my impulses, to defeat my desire to declare the job done and move on to the next thing. You do your best thinking by slowing down and concentrating. The best way to improve your ability to think is to spend time thinking. The problem is we want thinking to be easy and it's often not. Easy thinking carries a high cost. (William Deresiewicz).

"The way of research is way towards God". These words when I heard by a non-Muslim scholar, gave me another insight towards an understanding of

research for practical purposes. We rationally believe that there is a reason behind each happening, which might be known or not known to us. Research is the only humane approach to reach these reasons or facts. All these hidden facts are the attributes of The Mastermind of this universe, the creator, we believe "Allah Almighty". Hence by knowing more and more about the attributes paves the way towards stronger faith in the Creator. Let me use an example of some really good questions raised by a curious presenting faculty during last month's scientific debate (CPC) on thromboembolic (TE) complications in some patients of Covid-19. Though the case was about a case presented with a big thrombus in a major vessel warranting urgent intervention to save big loss. Clinicians are dealing with all available scientific knowledge, experiences and employing available modalities for such case management. There is always a need for something more effective. A query raised at the end was to "need of research to unravel underlying pathophysiologic events responsible for varied presentations of TE phenomenon ranging from TIA, stroke and major vessel occlusion. Its good understanding might help in devising some effective preventive, diagnostic, or management intervention. Similarly, another problem raised was "how to deal (remove) best with a big fragile, about to float thrombus in such patients" especially if found in bigger vessels leading to the vital organ. These are very relevant questions raised after some issues were noticed (research observation) by a scientific mind. It is the beginning of research thinking. There would be many angles and approaches here, to proceed on the research path.[2]

Form epidemiological perspectives: Why some patients of Covid-19, not all develop this state of disease. Factors or reasons may be presumed to be present in some who developed and absent in whom did not. Researchers don't accept these by chance. Reasons would be embodied in sociodemographic, biological, environmental, or health system aspects. Your work may start as prior deep readings on available basic & diseases related knowledge. For research work, we may conduct an initial descriptive inquiry as, descriptive analysis of a number (sample) of such cases of Covid-19 who developed TE and who did not. Define study variables based on prior knowledge, observations, experiences, and your intuitive power. Every research effort has some background construct or hypothesis (not statistical hypothesis created for acceptance or rejection) which is the actual mind of the researcher. We may label it as the "central framework" of research. Assemble the data in minute details and in an organized way (under statistical rules). As the age of all subjects may be considered under averages but if spread in smaller class intervals with frequencies in each class, gives you're a broader look and may hint towards more facts. Give a deep and repeated look at the data. Some peculiarities become visible and others can be noticed. Mathematical comparisons and Cross-tabulate for all presumed connections is a fundamental power of research thinking and reasoning. It simply counting categories of one variable into categories of the other. Examine the similarities within groups and dissimilarities between two groups. Pick crucial (on statistical grounds) facts. Statistical reasoning paves towards clinical reasoning. Significant statistical variability implies connections or non-connection among conditions or variables which in turn may strengthen your presumptions or negate to think differently. If your concept is not indorsed, even this is an important finding as now it is fixed. In any case, this work adds to an understanding of the phenomenon of your interest.[3] Researchers are striving for more & more knowledge under the need of devising solutions to the problems. Even if ultimate facts are not obtained, the research outcomes would benefit a lot.

For understanding & explaining the pathophysiologic aspect of the disease (TE), one first needs deep study of relevant basic knowledge and current literature on the subject, and even significant epidemiologic variability/ linked found may indicate way towards relevant facts or needed research ahead in pathophysiologic context. A good description, review, and comparative study of hematological, serological, and other pathological data of the study subjects may open horizons of new knowledge. In research, one moves from superficial or apparent phenomenon to deep or minute facts. The total research journey is mostly spanned over decades and centuries, but a curious inquiry would have great immediate worth. The great epidemiologist, John Snow about 200 years before his scientific work established cholera a water-borne disease and rejected the miasma theory during the cholera epidemic in London (1854) and saved millions of human lives. It was the time when neither microscopic life nor tetracyclines were discovered. His work was based on keen observations, quantification, and interpretation of the cholera mortality data. Similarly, it took almost a decade after Sir Alexander Fleming noticed, postulated, and interpreted the area of clarity around bacterial culture as an antimicrobial

activity (1928) to discover Penicillin. Today's science is the outcome of countless curious minds' endeavors over human history.

Considering the problem faced by a surgeon of surgical manipulation of a fragile, big about to float thrombus is had many research aspects. After a thorough review of basic knowledge and current evidence on the subject, again one needs to conduct a survey of such cases from biological, anatomical, and mechanical aspects. The study and analysis of the data obtained may satisfy your queries or may induce new queries in your mind. One needs to learn about existing modalities or machines if any used for such purposes and mechanisms within each. One may need to improve his/her understanding from an engineering perspective. Ideas can be shared with people from bioengineering or computers or any related field for collaborative research.

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