

Research?

Introduction

In the medical field, observation plays a key role in enhancing one's level of knowledge. During professional practice, clinical judgement is based on certain remedies that evolve from repeated personal observations of the practitioner, in addition to the accumulated standard textbook knowledge. "There are 60% chances that you will survive more than five years if you opt for chemotherapy for your bladder cancer". This judgmental statement from a seasoned oncologist represents not only his medical knowledge but also years of accumulated observations of such cases.

A medical student has observed that numerous strategies were tried to control the hiccups of the exhausted asthma patients, but all failed. However when drug X were given in order to improve the deteriorating breathing of the same patient, to the surprise and amusement of the student, the hiccups stopped. This accidentally observed finding was a new discovery for him. Repeated observations of the patients with hiccups proved to him that this regimen was workable. Later on when he took up clinical practice, whenever a case of the same medical condition came, his judgement favored the same regimen in the absence of any contraindication for the drug.

Research can be regarded as a course of critical and scientific inquiry into a particular subject'. Every medical professional, from his studentship till his retirement is involved in some form of research in his own personal style. Most of the time he is unable to communicate his findings to the professional community, because of the fact that these findings are not organized properly on scientific lines to make them acceptable in the professional world.

Moral: Every medical personnel is a researcher.

The first documented evidence of medical research in history is available in the writings of Hippocrates (460-377 BC). In writings he emphasized how to observe contributing factors e.g.. time, season, place, environmental conditions, personal behaviors or causal factors, which are still sound epidemiological concepts. In the 17th century, Thomas Sydenham took a revolutionary path against traditional medical theories by writing "Observation Medicae". His unconventional ideas got him into a lot of trouble and he was threatened with the cancellation of his medical practice license due to the unusual practices he adopted in that time. However, his work was fundamental in advancing the ideologies regarding the medical field, and shows the importance of observation in improving methods of diagnosis and treatment.

In the 18th century, James Lind and Edward Jenner made notable contributions by observing population changes and using experimental study designs for scurvy and small pox. In the 19th century, John Snow, known for his pioneering work in epidemiology, by working on the cholera epidemic, contributed numerous concepts and methodologies, which are valid even today. During the same century Louis Pasteur and Robert Koch mainly contributed to medical research by working on anthrax, tuberculosis and waterborne epidemics. They put to rest major notions of medicine prevalent at those times^{2,3}. However a major thrust in medical research occurred after World War II. In a relatively short span of time numerous classic, history-making researches of large scale were carried out especially in United States after that turning point⁴.

Although traditionally, the origin of epidemiology was connected to epidemics of various diseases that raged across Europe and Asia earlier, now its horizon has expanded to include all aspects of health and diseases. In the current era, research has developed into a medical subspecialty. Any medical professional, whatsoever his credentials or expertise may be, is also a researcher due to the very nature of this discipline. Medical research is an integral part of the basic description of medical literature. A medical researcher should have a sound understanding of a variety of scientific disciplines such as

biology, the behavioral sciences e.g. sociology, psychology, and demography as well statistics and computer science. A medical officer is appointed at a primary care facility. Though he spends most of his graduate studies in learning about rare syndromes and hard to find clinical findings, he soon observes that these do not impose significant health burden on the people. He investigated the ground realities with the help of his staff. On the basis of that situation analysis, he reallocates 80% of his time to immunization and basic health education in an effort to address the major problems of the community.

Moral: The evolutions of medical research emphasize the need for a thorough understanding and systemic approaches to gather and interpret medical data.

A group of medical students studied the aftereffects of violence on families living in urban areas. They found that those families who suffered human losses, later on suffered from major depression for a prolonged duration. Their colleagues and mentors were highly critical of these findings. They thought these findings had been anticipated and they knew them all along. Those facts, which can easily be foreseen by common sense, do not require such elaborate efforts. Actually, when research study outcomes are revealed, they seem predictable and not very surprising, as compared to when peers are asked to figure out the outcome beforehand. This phenomenon is Hindsight bias, which is a dilemma specifically faced by researchers who want to analyze the problem from its root⁴.

Those disheartened students probably would think a hundred times before undertaking another scientific study, after the so-called failure of their first project. Such mishaps usually occur because most of the fellows are unaware of the fact that such researchers have done a very important research by converting a layman's statement into scientific judgment on the basis of an epidemiological study.

Moral: A wide understanding of basic research principles is important. This is essential in order to utilize personal capabilities and scarce resources in right direction.

The medical term "Epidemiology" has the following structure:

Prefix: epi- = upon

Root: demo people

Suffix: -ology the study of⁶

In medicine it stands for study of the distribution and the determinants of health and disease states⁷. This can be further elaborated through this hypothetical example: a dentist wanted to study about teeth in a defined group of people. First of all, he observed the biological characteristics of their teeth, i.e. as compared to incisors and canines, molars have significantly deep fissures and pits. When he assessed the frequency and distribution of common dental ailments, he noticed that a large number of molars have caries. To further add to his knowledge, he observed the natural history of the disease, and noticed that it took 6-18 months from the formation of cariogenic cavities in the affected as compared to the unaffected people in the group. To determine the favourable conditions for caries development he compared the affected with the unaffected subgroup. The most important determinants he found, were genetic susceptibility, teeth morphology, saliva characteristics, food quality and lifestyle, including hygiene practices. Meticulous observations of the caries-affected subgroup helped him to classify the disease according to dental sites involved. He then started work to evaluate methods of cure and control. For cure the question before him was whether the use of antiseptic mouthwashes or caries restoration is effective. For prevention of caries he studied various alternatives, i.e. fissure sealment, fluoridation of water supply or fluoride toothpaste for topical use would be effective for his study group⁸⁹. If you think that after getting these answers the researcher's job was over, you are wrong. We still do not know which strategy is more cost effective, which strategy is more feasible, acceptable and affordable by the group, how to carry out successful health education and change their lifestyle for a particular cause and so on. There is no end to evaluating the scientifically valid queries for medical research probably; like minded researchers will take up the task and continue adding to the pool of beneficial knowledge.

Moral: In research, knowledge has a inspirational cycle i.e., knowledge generates questions and questions motivate research to gather further knowledge.

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