How to Prevent Medical Errors?

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Abstract

Medical errors are a serious health concern and are the leading cause of death in the United States. It is difficult to uncover a consistent cause of the error and provide a solution. Medical errors are in third place after heart disease and cancer. A recent Johns Hopkins study claims that more than 250,000 people in the United States die from medical errors each year. Other reports claim the numbers are as high as 440,000. The biggest reason for this disaster is the inability to make the right decision about diseases. Clinicians working in complex, high-pressure scenarios should focus on enhancing their learning to gain knowledge and skills. All of this is necessary to improve patient outcomes as well as clinician performance. Complex patient decisions made in uncertain conditions can also be influenced by the personal factors of physicians. Not allocating enough time to the patient, short communication and decisions that need to be acted on quickly, as well as pressure from other patients waiting to be seen, increase wrong decisions. Biostatistics methods reconstruct the mind for analysis, evidence-based alternative thinking, comparison, and complexity, which are the foundation of decision making. Biostatistical thinking does not accept any suggestions that are not evidence-based. We should teach this biostatistical idea to all our healthcare professionals, both theoretically and practically. There are main eight stages in the decision-making process are as follows; 1. Framing the problem 2. Hypothesis development 3. Data collection 4. Choosing the statistical method that provides the best evidence 5. Data analysis 6. Interpretation 7. Decision-making 8.Implementation. As a result, it is necessary to increase the Biostatistics education, which gives the methods of decision theory to prevent errors in the field of health and to make applications that will gain this skill.

Introduction

Medical errors are a serious health concern and are the leading cause of death in the United States. It is difficult to uncover a consistent cause of the error and provide a solution. Patient safety can be increased by noticing errors that occur, learning from them, and trying to prevent them (1).

Medical error is an avoidable adverse effect of medical care, whether apparent or harmful to the patient. Mistakes that are often common in hospitals include adverse drug events and improper blood transfusion, misdiagnosis, under- and over-treatment, surgical injuries and incorrect site surgery, suicides, restraint-related injuries or deaths, falls, burns, pressure ulcers, and mistaken patient identifications. These errors are most likely to occur in intensive care units, operating rooms, and emergency rooms (2).

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Today, there are evidence-based biostatistics lectures and science branches in all medical faculties throughout the world. The science of biostatistics teaches evidence-based decision methods to all health professions, especially to physicians. As a person who has been teaching Biostatistics in Medical faculties for forty years, I argue that this education is not enough. The difficulty of Biostatistics is sometimes mentioned. However, those who have this thought should remember; "If people believe that Biostatistics is difficult, it is only because they do not realize how complicated the diseases and life is, and they don't remember how some bacteria and viruses threaten the world. Biostatistics methods reconstruct the mind for analysis, evidence-based alternative thinking, comparison, and complexity, which are the foundation of decision making. Biostatistical thinking does not accept any suggestions that are not evidence-

based. We should teach this biostatistical idea to all our healthcare professionals, both theoretically and practically."

Factors affecting the right decision

Understanding clinical decision-making processes and the potential for clinical error has implications for improving both education and learning. Clinicians working in complex, high-pressure scenarios should focus on enhancing their learning to gain knowledge and skills. All of this is necessary to improve patient outcomes as well as clinician performance. In addition, it is essential for clinicians to develop effective communication and teamwork. Building systems that support and enhance accurate clinical decision-making is one of the most important avenues for quality outcomes and is essential to avoiding human error (5,6).

Complex patient decisions made in uncertain conditions can also be influenced by the personal factors of physicians. Not allocating enough time to the patient, short communication and decisions that need to be acted on quickly, as well as pressure from other patients waiting to be seen, increase wrong decisions (7,8).

Analysis, comparisons, and reasoning reconstruct the human mind. Biostatistical thinking is a way of understanding a complex world, revealing fundamental aspects of the structure of complex problems, and at the same time telling us how inadequate we are in our knowledge in the medical domain. Three main basic behaviors we can do with statistical thinking;

1. Define: The world and problems are complex, and we often need to reduce problems by describing them in a simplified way that we can understand.

2. Decide: We need to make data-based decisions, often in the face of unknowns.

3. Predicting: We often need to make predictions about new problems based on our knowledge of previous situations (9).

We have to use the terms correctly and appropriately, and we must also understand them correctly. According to Harvey Motulsky; "The phrase "statistically significant" is often misunderstood because this use of the word "significant" has almost nothing to do with the traditional meaning of the word to describe something important or consequent." (10).

Some news is surprising. According to Elizabeth Rosenthal MD, "Let's (not) get physicals," in which she lays out the evidence against the almost canonized ritual of an annual physical exam. She points out, "For decades, scientific research has shown that annual physical exams—and many of the screening tests that routinely accompany them—are in many ways pointless or (worse) dangerous because they can lead to unneeded procedures." (11). Moreover, according to Gary Taubes, a medical researcher at the Robert Wood Johnson Foundation, explaining that evidence suggests that eating less salt can sometimes worsen our health! (12).

A correct definition cannot be made without evidence. The right decision can only be made with the right evidence. For this reason, evidence-based biostatistics education should be given in a meaningful way in medical education. Only in this way, the ability to make the right decision based on evidence is created. Physicians should be trained in analysis and evidence-based biostatistics at every step to reduce the lives taken by medical errors.

All issues related to diagnosis, treatment, clinical practices, research, orientation, coordination, and control are resolved by the decisions made by the practitioners. Objectives, strategies, policies, and organizational designs must all be decided to resolve all health-related problems. The management process is based on decisions. Decisions are needed both to overcome the problems and to make the most of the available opportunities. The right decisions reduce the complexity, uncertainty, and variety of health problems. The foundation of credibility in planned research begins when the study begins. What the resources are should be reviewed and the most important thing is to minimize the bias of the researcher if any. The purpose of the analysis to be done is to organize and interpret the collected data objectively and to draw realistic results from it. Statistics are largely the basic thought processes they use in estimation, inference, control, and experimental design, and are the cornerstones of

management. Statistical thinking is therefore in the public domain. Biostatistical thinking can create new solutions for clinicians. In the short term, it can improve the quality of decisions. To minimize variability, sources of variation must be identified and eliminated. Stages in Decision Making are presented in Figure 1.
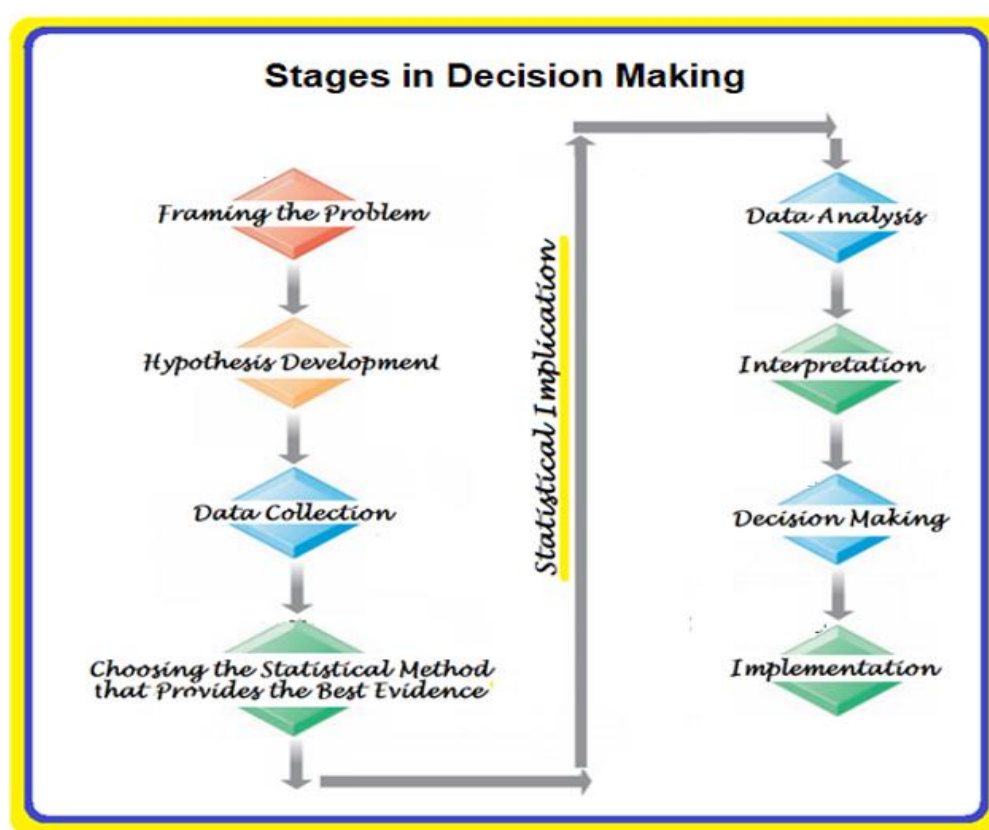

Figure1. Stages in Decision Making

According to Figure 1. There are main eight stages in the decision-making process are as follows;

1. Framing the problem

2. Hypothesis development

3. Data collection

4. Choosing the statistical method that provides the best evidence

5. Data analysis

6. Interpretation

7. Decision making

8. Implementation

Statistical thinking in decision making, statistical inferences, suggests and provides important solutions in problem formulation, hypothesis development, data collection, data analysis, evidence-based method selection, interpretation, decision making, and application of results. A statistical thinker can also look beyond the variables suggested by the practitioner and protect against ignoring influential variables or drawing erroneous causal conclusions. Oftentimes, people tend to jump to causal consequences. In general, researchers should realize that they might not be able to predict all relevant variables; before collecting data, it is important to see the importance of brainstorming, discussing with practitioners, and properly designed experiments (13,14).

Unfortunately, the real role of statistics in research is still unknown to some amateur researchers. The methods developed by statistics are an important branch of science in obtaining new interpretations and new solutions. In every field of medicine, continuous decisions are made regarding the diagnosis and management of patients. The two primary decision-making modes are intuitive and analytical. Physicians must be taught the features of intuitive thinking and the decision-making that comes with it. The mark of a well-calibrated thinker is the ability to balance the right blend of intuition and analytical reasoning in decision-making for a particular situation. Statistics have developed methods to explain the variables that make the variation in the problem complex, to determine and reveal their degree of influence. Decision-makers need to demonstrate their ability to apply their statistical knowledge to answer a question of interest. The development of statistical thinking should be specially developed for all decision-makers. The development of the types of thinking used by statisticians, ways of approaching problems, and applying methods should be taught to all decision-makers.

Statistical thinking is the set of interconnected processes in which "thinking processes that recognize that diversity is around us and exist in everything we do" work. Identifying,

characterizing, measuring, controlling, and reducing variation provides opportunities for improvement. It enhances the complex thought processes involved in solving real-world problems, using statistics to enhance this type of problem-solving (13,14).

As a result, it is necessary to increase the Biostatistics education, which gives the methods of decision theory to prevent errors in the field of health and to make applications that will gain this skill.

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