

Confirmation Bias Effects on Healthcare & Patients: A Literature Review

Sierra Sohan Ramachandran¹, Pravallika Padyala², Jungwoo Park³, Rajesh Goud Aithagoni³, Vishnu Hasini Pokala¹, Mohamed Ismael Mohamed¹, Krupavaram Bethala⁵ and Sailaja Nandennagari^{3*}

¹Neuqua Valley High School, Naperville, Illinois, USA

²Baylor University, Texas, USA

³Avalon University School of Medicine, Curacao

⁴Alexandra Faculty of Medicine, Egypt

⁵KPJ Healthcare University, Nilai, Malaysia

*Corresponding Author: Sailaja Nandennagari, Avalon University School of Medicine, Curacao.

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Abstract

Confirmation bias is the tendency to search for, interpret, and remember information that confirms preexisting beliefs, and significantly impacts healthcare and patient outcomes. This literature review explores the various impacts of confirmation bias on medical professionals, patients, caregivers, etc, and draws from a variety of studies, observations, and surveys. For healthcare providers, confirmation bias can result in diagnostic errors, specified treatment decisions, and biased/skewed interpretation of data regarding a patient which has detrimental effects on clinical judgments and healthcare quality. Similarly, on the patient side, confirmation bias influences health behaviors, following medical advice, and thoughts regarding illnesses, which cause adverse health outcomes. The review emphasizes key mechanisms by which confirmation bias appears in clinical settings, including cognitive heuristics, diagnostic anchoring, and patient-practitioner interactions. Furthermore, the review discusses ways to alleviate the negative impacts of confirmation bias, such as incorporating specified guidelines, increasing training and awareness, and enhancing open communication. By understanding current research, this literature review emphasizes the need for proactive measures addressing confirmation bias to improve decision-making processes and healthcare solutions/outcomes in medical practice.

Introduction & Background

Misdiagnosis continues to plague the healthcare system, claiming thousands of lives every year due to mistakes made in decision-making [1]. Much of this can be blamed on a single cognitive bias: confirmation Bias. Confirmation bias is defined as the tendency to search for information that supports preconceptions and to ignore or distort contradictory evidence. Humans are highly susceptible to this cognitive bias, which can create unnecessary overconfidence and stubbornness; when mixed into healthcare diagnosis, it can even become fatal.

Before observing the effects on healthcare, the purpose of confirmation bias and its role in human behavior must be understood. Confirmation bias is a form of cognitive bias, a systematic pattern of deviation in rational thinking. Confirmation bias causes the person to search for specific information catering to their beliefs, failure to properly assess the situation, resistance to change beliefs once formed, and overconfidence in the validity of the stance taken [2]. It could even be a subconscious response to new information, in order to avoid change or adaptation. Of course, sometimes confirmation bias can be helpful, especially in situations where mental conflict would be detrimental. However, in a profession where all possible errors need to be minimized, avoiding and ignoring indisputable evidence can be dangerous.

Impact on Patient Care

Confirmation Bias causes physicians to see what they want to see; as they diagnose and create a treatment plan for the patient early on, misdiagnosis can get passed on and built up [3]. The errors can prevent and delay appropriate treatment, endangering the patient at various levels [4].

Self-Reflection Survey (Japan)

According to a survey run in Japan to study the role of the many cognitive biases in diagnostic errors, Confirmation bias caused roughly 32.3% of the errors. Additionally, this study explored the effects of many other heuristics, including Anchoring Bias, the tendency to rely on the first piece of information received; Premature Closure, quick diagnoses; and Availability Bias, the tendency to rely on immediate examples that comes to mind regarding a certain topic. Out of all the cognitive biases studied, Confirmation Bias was ranked 5th out of 10; the study is statistically significant as confirmed by p-value. In addition, roughly 11.1% of all errors caused by cognitive biases in general occur almost daily [5].

Critical Review of Cognitive Biases & Heuristics in Decision-Making

This study was run to confirm the presence of cognitive biases in healthcare decision-making; they found that roughly 61% of the decisions that involved patients had some level of cognitive biases [6]. Confirmation Bias is heavily focused on due to its nature of oversimplifying information.

Review

Stereotypical Factors & Confirmation Bias

Many factors can contribute to a physician's adoption of confirmation bias. One of the most prominent factors is stereotypes involving race; stereotypes in general can affect the information that people can become attentive to/ignore altogether. Even more, subconsciously, people search for and remember information that accommodates their own pre-existing notions. In a medical setting, this can translate to healthcare professionals unknowingly searching for and fixating on symptoms and possible diagnoses related to the social group of the patient [7]. Relying on stereotypes can impede the employment of effective practice and influence the health care professional to make an inaccurate diagnosis. For people of color, this can be very detrimental, as they are most commonly affected by stereotype-driven diagnoses. For instance, it was found to be more common for Black and Hispanic Patients with Bipolar Disorder to get misdiagnosed as Schizophrenic compared to their White counterparts [8].

Race & Reaction Time

It was found through a study that doctors automatically associate certain diseases with Black patients even before proper analysis. When shown a face (either white or black) and subsequently asked to categorize names of treatments and diagnoses, the doctors were faster in associating and coming up with a diagnosis when exposed to the face of the black patient than they were with the white patient (Gordon et al., 2012) [9]. The doctors were mentally primed to come up with specific diagnoses that are commonly known to be associated with black people, thus influencing judgment. Although there are medical conditions, such as skin-related diseases, in

which race plays a big role, jumping to conclusions during medical diagnosis can be detrimental; clinicians need to make sure to support the diagnosis with evidence including lab data, diagnostic imaging, etc. to avoid generating misdiagnosis.

Diversity in Workforce

To decrease the frequency of stereotyping in patient diagnosis, workforce diversity should also be increased and invested in. The diversity of healthcare professionals is gradually increasing, however, it is a very slow process. Yet, there has already been an established inverse relationship between discrimination and diversity within the workforce. As people of different ethnicities enter the profession, logically, there would be a complementary influx of accurate diagnoses: not only do doctors fall less likely to stereotypical errors when patient-doctor races are matched, but the patients become more compliant and trusting of their doctor's decisions [10].

Relationship Between Stereotypes & Confirmation Bias

A stereotype is defined as a "widely held but fixed and oversimplified image or idea of a particular type of person or thing." They involuntarily cause people to change their demeanor towards certain people depending on associated perceptions of the social groups the person belongs to, creating prejudiced attitudes. Confirmation bias draws on subliminal information, such as stereotypes, to simplify and draw conclusions, thus making the person prone to ignoring contradictory information altogether. In a medical setting, this could mean that the healthcare provider disregards certain symptoms in favor of others that comply with a possible stereotypical condition, thus further consolidating their inaccurate diagnosis.

Limiting Confirmation Bias in Healthcare

Confirmation Bias is more likely to occur in decision-making situations due to humans' common use of intuitive thinking strategies. Intuitive thinking strategies can be explained as "gut feelings," or without proper reasoning. In such situations, heuristics are used to jump to conclusions in order to save time; healthcare providers are trained to overcome this urge by using evidence-based practice, and more often than not, they often do use this method. However, as humans, they are prone to instinctively using information from previous experiences, stereotypes, environmental factors, etc. to advance into a diagnosis, especially when attributed to situations. Of course, in time sensitive situations where the patient is in dire need of medical attention, this can be helpful for doctors to act fast. The use of heuristics is an ingrained method for problem-solving that is meant to help people be able to come up with a solution without wasting time and effort, yet it yields a higher risk for mistakes. To limit confirmation bias, hospital faculty must make an active effort in order to train their employees to impart unbiased diagnoses and continuously practice evidence-based.

Possible Strategies

1. **Recognize Confirmation Bias** - Healthcare professionals should be familiarized with the concepts and examples of confirmation bias, especially under the context of healthcare provision. In addition, they should also learn how to detect the employment of confirmation bias in their own workspace, as it occurs unconsciously; by using appropriate testing, second opinions, etc., providers can find ways to limit their own biases.
2. **Metacognition** - Providers should practice guided reflections to make sure they are not fixated on a specific diagnosis and are open to/prepared for other possibilities [11]. They should be willing to reason with their own conclusion and effortfully consider all given facts and data to come up with an accurate diagnosis. Hospital facilities acknowledging the presence of confirmation biases and their role in inequities in treatments can eliminate the risk of irrational decision-making.
3. **Diversity Education** - In addition to diversifying employees, hospital training facilities should also invest in helping healthcare professionals to become more aware of their own microaggressive behavior and to avoid it, along with strategies to help them avoid stereotyping altogether. Some studies have proven such educational efforts in the form of "faculty role-modeling and interprofessional rounds" have positively impacted learners' attitudes among other aspects. Educating healthcare providers to become more self-aware of their biases can play a pivotal role in combating mistakes stemming from subconscious biases [12].

4. Balance Testing - Doctors should try to perform balanced testing in order to avoid fixation. This way, they can try to avoid choosing the over-favored diagnosis and catch on to other possibilities. An example of this would be to test different kinds of samples from a patient to holistically analyze their bodily regulation even if the doctors feel inclined toward a diagnosis in initial processing. In more severe cases, as time is of the essence, the doctor can start preparing for their inclined diagnosis, but be open to switching if further testing indicates another diagnosis.

Case Studies/Examples

1. A child was brought to a university medical center with symptoms such as involuntary movement of limbs; the prior diagnosis of the child was "conversion disorder." Over the course of the next few months, the child was brought to the hospital with amplified symptoms, but the neurologists continued to stand by the original diagnosis, without further testing. Unfortunately, during this period, the child lost the ability to speak, but an independent neurologist agreed to examine him and found that the issue was with the immune system and got the child the treatment that he needed very much. However, despite the treatment, the child lost the permanent ability to speak and had impaired abilities in reading and writing [13].
2. American Heart Association & American College of Cardiology released guidelines in 2013 for Cholesterol to identify patients at risk and different forms of therapy. Yet, it was later discovered that they failed to incorporate contradictory evidence in the publication. Similarly, the American Diabetes Association was caught making the same blunder in the 2016 Standards of Medical Care in Diabetes; they claimed that Statin Drugs (reduce Cardiovascular disease) for most diabetic patients, citing a trial with the medications. They failed to incorporate the results of the study, which was that Statin drugs have no effect on Cardiovascular mortality and failed to mention the lack of benefits for diabetic patients in certain subgroups when taking Statin [14].
3. A patient came in with severe chest pain, which the healthcare providers had suspected was either cardiac or pulmonary-related. They performed a chest x-ray on her, which came out clear, but there was an indication of inflammation in her blood work due to a high C-Reactive Protein, and they discharged her with anti-inflammatory medication without follow-up. After discontinuing the medication, the symptoms returned and in another hospital, they performed ultrasound scans in her abdomen, revealing gallstones. They then gave her an accurate treatment and resolved her issue [15].

These three cases derived from a lack of verification and failure to consider and search for other possibilities. Confirmation Bias can be highly dangerous in a medical setting because ignoring or failing to probe for information could cause the provider to overlook the correct diagnosis altogether. When the evidence is presented suggestively, in the sense that it seemingly leans on a disease, it can be easy for providers to fixate on a certain diagnosis. Still, by failing to look at other dimensions, they can ultimately put the patient at severe risk.

Ethical Considerations

When healthcare providers misdiagnose based on anything, let alone due to Confirmation Bias, they vehemently put the patient's life in danger. Upon entry into the profession, healthcare providers are expected to do what is in the best interest of the patient, also known as beneficence [16]. Even if it is an involuntary mistake that occurred, putting the patient's life at risk is non-negotiable and will result in penalization; patients have the right to speak against a provider if they are concerned with the treatment plan [16]. Confirmation Bias is a trap very easy for healthcare providers to fall into, overlooking other options, thus tunneling the patient's treatment pathway from the beginning. By actively pursuing their goal of helping patients overcome ailments, they can consciously assess their treatment plans and open themselves up to other possibilities and reduce the chances of falling into biases. Doctors continuously care for patients in a majoritively altruistic attitude; by eliminating the chances of biases to cloud judgment, providers can continue to excel at providing quality care for patients. All the articles considered for this review are tabulated in table 1 as follows.

S.No.	First Author	Year of Publication	Type of Study	Types of Bias
1	Deidre McPhillips	2023	Quantitative (Survey)	Misdiagnosis Rates
2	Uwe Peters	2020	Observational	Confirmation Bias Function
3	Timothy M. Smith	2021	Fundamental	Overview of Cognitive Biases
4	Erin P. Balogh	2015	Quantitative (Survey)	Diagnostic Errors
5	Takashi Watari	2022	Quantitative (Survey)	Cognitive Biases in Japanese Hospitals
6	Giampaolo Perna	2022	Exploratory	Confirmation Bias in Mental Healthcare
7	Katherine Pudifoot	2019	Cross-sectional study	Stereotyping Patients
8	S. Mukherjee	1983	Case Study	Misdiagnosis of Bipolar Patients as Schizophrenia; ethnicity
9	Gordon Moskowitz	2012	Experiment	Unconscious stereotyping in ethnic patients; race, discrimination
10	Carrington Moore	2022	Quantitative (Survey)	Ethnic Patient's Preferences in Doctors
11	Tiffany S. Doherty	2020	Experiment	Overcoming Cognitive Biases
12	Brandon M. Togioka	2023	Exploratory	Diversity and discrimination in healthcare; discrimination, race
13	Faraci Lange LLP	2018	Case Study	Medical Malpractice due to Confirmation Bias
14	Robert DuBroff	2017	Exploratory	False suggestions given by health corporations due to Confirmation Bias
15	Rodney Peyton	2023	Case Study	Misdiagnosis due to Confirmation Bias
16	Jacob P. Olejarczyk	2022	Exploratory	Patient Rights; Ethics

Table 1: Literature review of Articles.

Conclusions

Confirmation Bias in healthcare refers to when healthcare providers subconsciously use pre-existing information and parts of the facts to construct their own diagnosis, thus ignoring all other possibilities, putting the patient's life potentially at risk. In terms of patient care, this could delay the employment of effective treatment; in healthcare, time is a crucial factor, and falling victim to assumptions can waste the crucial period for a treatment to work sufficiently. Many factors can play into the professional falling into the trap of Confirmation Bias when making a diagnosis, such as stereotypes, pre-existing notions, prior experiences, presentation of the symptoms, etc. However, with effective and mindful strategies, healthcare providers can minimize the effects of bias and increase the quality of care. Patients seek professionals to better their own health and minimize concerns; conversely, healthcare professionals aspire to administer quality care on patients. Through the employment of adequate strategies and open-mindedness to combat Confirmation Bias, healthcare professionals can continue to do the best for their patients, and patients can continue to receive excellent care.

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