

Introduction and Clinical Application of the Biopsychosocial Model

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A biopsychosocial model is an approach that postulates the interaction between biological (genetic and biochemical), psychological (thoughts, emotions, and behaviors) and social factors (culture and family) in the context of a pathological process. This model was initially designed by George Engel in the 70s, with a relevant limitation such as its theoretical bases and principles cannot be validated by the experimental scientific method. This model has a more integrative and less biological vision of the health and disease process.



The Biomedical Model in Organic and Mental Disease

The biomedical model was adapted by many scientists, physicians and surgeons in the mid-20th century. The biomedical model is still the preferred model to explain diseases and pathogenesis by doctors, insurance companies and the pharmaceutical industry nowadays for two main reasons.

1. First, the biomedical model is **easy to understand, experiment upon, be modulated and provide consistent results** in response to intervention.
2. Second, by employing the biomedical model, one can **easily generalize his or**

her results and observations about a certain disease, condition or new treatment. The second feature of the biomedical model is of crucial importance to the pharmaceutical industry and insurance providers.

While the biomedical model can easily explain simple illnesses such as pneumonia, it has many shortcomings which made it **unpopular among psychiatrists** that follow psychodynamic approaches, or those who are looking for a holistic approach in medicine.

The biomedical model **tries to explain physical and mental disorders on the molecular and cellular level** without considering the possible causative relationship of the patient's psychology or the effect of the social environment on the patient's condition.

This approach was seen as **dehumanizing to the patient by some psychiatrists and physicians in the 1970s**; therefore, a new model was born to make medicine more humane again and that model was known as the **biopsychosocial** model.

What is the Biopsychosocial Model?

The biopsychosocial model was first defined by George Engel in the 1970s. The model was created to explain the **interaction between the patient's biology, psychology and social interactions** in health and disease. It can be **considered more as a philosophy** than a scientific approach to health and disease because many aspects of the model cannot be confirmed or studied in an experimental design.

The biopsychosocial model aims to understand the patient's suffering and disease from the societal to the molecular level and in between. The model was put in place because science, at the time, has started to become exclusively reductionistic, analytic and very specialized.

The **main driving force** for the creation of the biopsychosocial model was the observation that many clinicians in the mid-20th century started to **consider their patients as objects rather than humans**. Medicine has become emotionless and dehumanized in the eyes of George Engel.

The Main Limitations of the Biomedical Model

Before we explain the added value of the biopsychosocial model, we must define a few terms related to biomedical model limitations. The biomedical model, according to Engel, had three main features that made it dehumanized. These features were **dualism, reductionism and the detached observer**.

Dualism in the Biomedical Model

The biomedical model acknowledged that the human being consists of a body and a mind. The mind is different from the organic brain which is part of the "real" body. **The biomedical model focused on the "real" body and completely ignored the "mind" of the patient** which, in the eyes of Engel, made the biomedical model very dehumanizing.

The biomedical model focused on the body because it was considered an easy target for experimenting and learning compared to the mind. Because of the separation between the two, it was **difficult to explain how fear, anger, and sadness influenced the physiologic and pathologic status of humans**.

For instance, it was not possible to explain why the risk of a second myocardial infarction was higher among patients who develop a major depressive disorder or an anxiety disorder after the first heart attack.

Reductionism in the Biomedical Model

The second problem in the biomedical model according to Engel was reductionism. The biomedical model **only focused on what can be measured and objectively analyzed** while ignored other parts of the disease that are impossible to objectively measure. In other words, Engel argued that a doctor who follows the biomedical model to the core is a cold, impersonal technical clinician who can have a negative impact on the physical well-being of the patient.

The Observer and the Observed

Because Engel wanted to study the human as a system, he wanted to include the human part, “the mind”, in the experimental design of medical research and the clinical evaluation of the patient. The biomedical model argued that it **is only possible to alter the status of the body to provide more evidence** that what is being observed is directly related to the patient’s disease or pathology. Engel stated that the same can be done on the human part as we will explain later.

Evidence in Favor of the Biopsychosocial Model

To think that the human body is affected by pathogens in a linear model is very limited and inaccurate. For instance, genetic predisposition is known to play a role in arterial hypertension. However, it is quite clear that the age of onset of hypertension, response to medication, and the causes of hypertensive crises in the patients are largely affected by the social environment as well. Therefore, Engel and others have argued that the **relationship between the potential causes of a health problem and the problem itself is a complex one.**

Complexity and Circular Causality

One approach in the biopsychosocial model is to understand that several environmental factors, in addition to biologic determinants, interact with each other to cause disease.

An exemplary patient

For example, a patient with a **strong family history** of premature myocardial infarction is at an increased risk of developing a myocardial infarction himself, especially if he is a male. If that person is also **obese**, then the risk of myocardial infarction increases even more. Now, let us imagine that that patient is so obese that he started to develop **knee pain** and osteoarthritis because of being overweight. This means that the patient will opt to follow a **sedentary lifestyle to avoid knee pain**. Accordingly, that patient will eventually add more weight.

Now, at some point, that patient will become **depressed** because of his body figure or because his girlfriend has broken up with him because of his body shape. Because of being depressed, he might become more anxious about his life and eventually start **cigarette smoking**.

Now the patient has several risk factors for myocardial infarction, i.e., obesity, cigarette smoking, depression, anxiety, and a sedentary lifestyle.

The relationship between these different causes of myocardial infarction and the end-point “myocardial infarction” is complex and not linear. This approach in medicine is **known as circular causality** and is **inspired by the biopsychosocial model**.

The problem with the complexity and circular causality model is that **it identifies too many possible causes of the problem** that are in play in a closed system. You, as a physician, can only modify a limited number of these factors and you usually cannot modify more than one or two factors at the time; therefore, a structural hierarchical causality model was needed.

Structural Causality

The problem of circular causality

The main problem with circular causality is that **one can identify too many risk factors for a condition**. This approach can have a negative effect on the treating physician. For instance, the physician might start thinking that if only his patient did not smoke cigarettes, he would not have developed myocardial infarction.

Failure to understand the relationship between the other causative factors is the reason behind this negative ideation. If that same physician understood that the patient started smoking because he is depressed and anxious about his obesity problem, he would have understood the real problem here and started working on fixing it.

The aim of structural causality

Therefore, the aim of structural causality is to **understand which potential cause of the end-point “myocardial infarction” can be modified easily, strongly, and cost-effectively** in this example.

- Genetic predisposition and family history are two things that cannot be modified in the patient, as well as male gender.
- On the other hand, the patient’s smoking habit, depression, obesity and perhaps hypertension or hypercholesterolemia can be modified.

Now, **trying to modify all of them at the same time is doomed to fail** in most cases. Instead, a physician should learn how to prioritize.

Prioritizing potential causes

Perhaps in this patient, the two most important things to improve are **hypertension and depression**. Once the arterial blood pressure is brought down to normal levels, the risk of myocardial infarction is expected to drop significantly.

Additionally, when the patient is provided with **adequate psychiatric care** for his or her depression, he might stop feeling guilty “my obesity is the reason that my girlfriend left me”.

Once the patient’s mood is improved, he might start **partaking in regular physical exercise**. When the patient understands that regular exercise would lower the risk of myocardial infarction, even if he does not lose weight significantly in the first few months, he would start doing more physical exercise while learning to accept his body shape.

Once the patient does more regular exercise, one would expect that he will **start losing more weight**; therefore, the patient’s satisfaction with his life choices will be improved and his **high cholesterol blood levels might start dropping**.

Therefore, structural causality is the main key for the successful application of the biopsychosocial model in modern clinical practice.

The Application of the Biopsychosocial Model in Clinical Practice

If someone chooses to apply the principles of the biopsychosocial model in his or her own clinical practice, that physician is expected to face a few challenges.

Patient-Centered Health Care

A physician who follows the principles of the biopsychosocial model would generally employ a patient-centered or a relationship-centered approach in his or her clinical practice. This approach **considers the patient's ideas, thoughts, emotions, and concerns about their medical condition**; therefore, it usually introduces the structural causality model of the biopsychosocial approach to medical disease.

Limitations of patient-centered healthcare

When the health-care choices and decisions are patient-centered, the treating physician might become **overwhelmingly affected by the patient's emotions**; therefore, the choices made and offered by the treating physician might not be the best available option for the patient. In other occasions, the **physician's own emotions and ideas might be projected onto the patient instead of truly empathizing with the patient**. These mistakes should be avoided whenever possible.

Autonomy in a Patient-Centered Health Care

When the healthcare provider follows a patient-centered approach, he or she might give the patient **too much autonomy which could backfire**. While patients always prefer to be part of their management plan, they do not want to be included in every single decision, especially if they are reluctant.

If you tell too much information to a reluctant patient, he or she might not be able to make any decision regarding their management plan; therefore, it is better to **provide the patient with an informed choice that is supported by the current evidence in a healthy and caring environment**, and then the patient can choose if he or she agrees to accept this management plan.

Acknowledging the Social Part of the Problem

When you follow a patient-centered approach, you will start to understand that the social environment of the patient has a huge impact on his presenting illness.

An exemplary patient

For instance, a **woman with multiple bruises from an abusive husband** might seek medical intervention for the bruises. If you are following a purely biomedical approach, you will only focus on the molecular basis of the bruise and how they form and you will just provide medical care for the bruise, exclude any fractures and treat accordingly.

On the other hand, when you follow the biopsychosocial model, you come to **realize that these bruises have been caused by a social situation which is domestic**

violence.

Now, you might end up in a **dilemma**.

- Should you act immediately to remove the patient from that environment, or
- Should you listen to the story passively and only provide medical treatment for the bruises without any social intervention.

The best approach nowadays is to **acknowledge the social problem of the issue and provide some advice about what one in her shoes can do**. Never suggest to the patient that she should get out of that relationship without forming a long-term trusting relationship first.

Now, that does not mean, in any way, that you should accept this form of social injustice towards your patient, instead, you should **ask for consent to intervene as soon as possible** once you have gained the patient's trust. Once the patient gives her consent, you can contact the responsible authorities and take action to solve the issue.

Principles of Biopsychosocial-Oriented Clinical Practice

The main goal of the physician is to **understand the patient**, acknowledge the biological causes of the current medical condition, but also know that the psychological well-being of the patient and the societal surroundings can also affect the patient; therefore, the patient is the center of the process and the physician is calibrated per the patient's needs and concerns.

The main goal of meeting with the patient and obtaining the history should be **creating a trust**. Once you have the trust of the patient, you will start to learn more about the psychological and social aspects of their illness.

The treating physician should **show curiosity and should care about the patient**. Even if you know too much about the biological part of an illness, do not assume that all cases are the same.

You should always provide an **evidence-based treatment plan** to your patients before getting their consent instead of a treatment plan that is based on your experience. When the treatment plan is based on the experience of a doctor who employs the biopsychosocial model, that doctor might project his or her own feelings and opinions in the treatment plan.

When you follow the biopsychosocial model, you will stop thinking of your patients as objects and numbers. You will learn to **understand that every patient is indeed different**. You will start treating patients instead of diseases.

Once this happens, sometimes you will have an **intuition that you should not provide the typical treatment** for a given condition for some patients for an unknown cause. In that case, you should **trust your intuition** and start looking for an explanation of why you think you should not provide the typical treatment. However, you should do so as long as you are following an evidence-based medical practice and not your own experience.

Finally, the last principle is to know that you **need to get informed consent on a management plan** that is based on clinical evidence. Explaining this evidence to the patient might be difficult and challenging. You should learn how to explain medical terminology to the patient and then provide the most recent evidence behind your suggested management plan. Only then, the patient can provide informed consent. This is the autonomy your patient should have when being treated by you.

References

Borrell-Carrió, Francesc et al. "[The Biopsychosocial Model 25 Years Later: Principles, Practice, and Scientific Inquiry.](#)" Annals of Family Medicine. 2004;2(6):576-582. Available at: <http://www.annfammed.org/content/2/6/576.abstract>

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