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Review Article

Addiction - A Medical Model of the Disease

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Abstract

The Medical Model of Addiction had many significant implications for how addiction is understood, treated, and addressed at individual, societal, and policy levels. While it shifted a common view of addiction from being social aberration to acceptance of addiction as a medical condition, it also resulted in acceptance of a multidisciplinary medical approach to addiction treatment that integrates medical, psychological, social, and environmental factors in addressing this complex issue. The Medical Model of Addiction perceived addiction as a chronic, relapsing brain disease characterized by compulsive drug seeking, use, and lack of control despite harmful consequences emphasizing the biological and neurological aspects of addiction, suggesting that changes in brain structure and function drive addictive behaviors.

Introduction

Historically, there is a societal stigma associated with Addiction. Addiction and chemical dependence are viewed as a choice rather than a health issue. These attitudes need to change. Addiction must be viewed as a medical problem that involves biological, psychological, behavioral, and societal elements. Addiction is a treatable medical disorder. While the medical community was taught for years that Addiction belongs to the psychiatric realm of medicine, modern health care acknowledges that a comprehensive medical and pharmaceutic approach to the treatment of Addiction is most effective.

This article presents how the Medical Model of Addiction was developed and its further influence on the development of addiction medicine.

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Addiction

Merriam-Webster dictionary defines addiction as

A compulsive, chronic, physiological, or psychological need for a habit-forming substance, behavior, or activity having harmful physical, psychological, or social effects and typically causing well-defined symptoms (such as anxiety, irritability, tremors, or nausea) upon withdrawal or abstinence [1]. While this definition is well-developed and all-encompassing, it does not truly define the term "addiction" from a medical point of view. While developing, the current acceptance of the concept of Addiction as a "disease" indeed required comprehensive terminology to define it. Application of proper medical terminology in the definition of a disorder is critically important because it provides clear language and medical terms to communicate, in a professional way, a scientific understanding of the disease, its risk factors, an appropriate diagnosis, treatment prognosis, treatment options, and the disease's relationship to the public health policy.

The American Society of Addiction Medicine defines Addiction as

A treatable, chronic medical disease involving complex interactions among brain circuits, genetics, the environment, and an individual's life experiences. People with Addiction use substances or engage in behaviors that become compulsive and often continue despite harmful consequences [2]. Vast research validated again and again that addiction is a medical disorder rather than a social phenomenon. That all started with the development and introduction of a Medical Model of Addiction that is currently accepted by the medical profession as a valid theory of chemical dependency.

Addiction as a Medical Disorder

Addiction is a disease

Diagnostic and Statistical Manual of Mental Disorders (DSM-5-TR) is the manual of mental disorders developed by the American Psychiatric Association. DSM5-TR provides a standard classification of mental disorders used by mental health professionals in the United States.

DSM-5-TR defines an addiction as a Substance Use Disorder (SUD). As with any other disorder, SUD presents with particular patterns of symptoms that develop as a result of and are caused by the use of chemical substances that an individual continues to use despite their multiple adverse effects. DSM-5 differentiates between the use and misuse of the substances used by individual users and lays out eleven (11) specific criteria that can arise from substance misuse.

In general terms, these 11 criteria are subdivided into four (4) basic categories:

- Impaired control
- Physical dependence
- Social problems and

- Risky use

The 11 criteria presented by DSM-5 are:

- Using more substance than intended or using it for longer than intended
- Trying to cut down or stop using the substance but being unable to do so
- Experiencing intense cravings or urges to use the substance
- Needing more of the substance to get the desired effect (also referred to as tolerance)
- Developing withdrawal symptoms when not using the substance
- Spending more time getting and using drugs and recovering from substance use
- Neglecting responsibilities at home, work, or school secondary to substance use
- Continuing use even when it causes relationship problems
- Giving up essential or desirable social and recreational activities due to substance use
- Using substances in risky settings
- Continuing to use despite the problems the substance use causes to one's physical and mental health [3]

Additionally, DSM-5 defines three (3) Levels of Severity that are determined by the number of symptoms presented by the patient. For example, the presence of two to three symptoms indicates a mild substance use disorder, four to five symptoms indicate a moderate substance use disorder and six or more symptoms indicate a severe substance use disorder.

A severe level of Substance Use disorder SUD is also known as an addiction. Determination of the severity level of the substance use disorder is important because it helps the treating practitioner develop the most optimal treatment plan. It is essential to state that, like other illnesses, SUD and, subsequently, addiction get worse over time, similar to many other chronic diseases. Fortunately, effective treatment and further prevention efforts are generally as successful as those for other chronic diseases.

Finally, most patients suffering from SUD are likely to need ongoing treatment and recovery support using a chronic care model for several years after more urgent detoxification and intensive therapy phases of treatment are completed.

Medical Model of Addiction

As of today, there is no single, universally accepted alcohol or drug addiction model that would provide an accurate theoretical foundation for addiction. The main reason for such a theoretical vacuum is the fact that addiction is a very complex and multifaceted ailment. Additionally, chemical dependency and addiction are specific to each type of drug, especially with the consideration that each additional "designer" street drug comes with its own elements of addiction. The original Medical Model of awas introduced by Elvin Morton Jellinek (1890-1963) - a psychologist and biostatistician who is one of the founders and the key figure of modern addiction science - an interdisciplinary field of basic research, applied science and clinical practice.

The Medical Model of Addiction was developed on research related to alcohol abuse and alcoholism, which was the main focus of Jellinek's life work.

The scientific foundation of the "Disease Model" of substance abuse (known today as the "Medical Model of Addiction") rests on three following principles:

- Addiction is a medical disorder (similar to cardiovascular disease or hernia)
- There is a biological predisposition towards addiction.
- The disease of addiction is progressive [4]

Ultimately, the Medical Model of Addiction rests on the belief that "individual biological vulnerability to the effects of certain chemicals, […] is expressed as a loss of control over their use" [5]. Moreover, according to Doweiko [4], the Medical Model of Drug Addiction is based on the belief that "much of behavior is based on the individual's biological predisposition [to substance use]" [4]. Furthermore, Doweiko [4] states: "Thus, if the individual behaves in the way that society views as inappropriate, the medical model suspects that a biological dysfunction is responsible for this "pathology" [4].

Historically, any form of addiction was seen as a moral disorder. The Medical Model of Addiction developed by Jellinek [6] focused on the impacts of alcoholism and ultimately led to the decision of the American Medical Association to classify alcoholism as a formal disease in 1956. This recognition allowed physicians to view alcoholism treatment as a form of medical cure that would include pharmaceuticals, mental health issues, and psychotherapy treatment in the recovery phases of the treatment. The Medical Model of Addiction viewed alcoholism as a medical disorder with a series of specific physical symptoms as well as multiple complications that arise from alcohol misuse, which included emotional, social, and vocational elements of the disease that were similar to other commonly diagnosed psychiatric disorders.

Importantly, Jellinek viewed alcoholism as "a progressive disease that, if not arrested, would ultimately result in the individual's death" [4]. Applying the concept of the Medical Model of Addiction, Jellinek identified five forms of alcoholism that were characterized by psychological dependence, physical complications, tolerance, progressive nature of alcohol use, and drinking patterns. While the Medical Model of Addiction was a novel theoretical concept, it was based on multiple research findings that ultimately led to the development of the theory.

Jellinek and his team [6] suggested that alcohol addiction is a result of a progressive development. There are four stages that an atypical user goes through to become an addict. These phases are:

- Pre-Alcoholic Phase - when an individual's use of alcohol is aimed at the relief from social tension
- Prodromal Phase - when the individual experiences memory blackouts, develops a preoccupation with alcohol use, and ultimately the feeling of guilt over one's behavior while intoxicated

- Crucial Phase - when an individual becomes physically dependent on alcohol, loses control over drinking, experiences social withdrawal in favor of alcohol use, and neglects proper nutrition while drinking
- Chronic Phase - when an individual experiences motor tremors, obsession with drinking, moral deterioration, and risky use of "substitutes, like rubbing alcohol, when "safe" alcohol is not available [4].

The American Society of Addiction Medicine (ASAM) today defines addiction as:

A primary, chronic disease of brain reward, motivation, memory and related circuitry. Dysfunction in these circuits leads to characteristic biological, psychological, social, and spiritual manifestations [7].

It is important to emphasize that the medical Model of Addiction established essential critical components of the disease, which include:

- Brain changes: Addiction is associated with alterations in brain structure and function, particularly in areas related to motivation, reward, decision-making, and self-control. Chronic drug use can lead to changes in neurotransmitter systems, such as dopamine, which plays a central role in the brain's reward circuitry
- Genetic factors: Genetic predisposition can influence an individual's susceptibility to addiction. Specific genes may contribute to differences in how people respond to drugs, their likelihood of developing addiction, and their ability to recover from addiction
- Environmental influences: Environmental factors, such as stress, trauma, peer pressure, and access to drugs, can also contribute to the development of addiction. Adverse childhood experiences and exposure to substance use in the family or community can increase the risk of addiction later in life
- Psychological factors: While the medical Model emphasizes the biological aspects of addiction, it also recognizes the role of psychological factors, such as mental health disorders, trauma, and coping mechanisms, in contributing to substance abuse and addiction
- Chronic nature: Addiction is often characterized as a chronic condition that requires ongoing management and support. Like other chronic diseases, such as diabetes or hypertension, addiction may involve periods of remission and relapse, and long-term treatment may be necessary to maintain recovery
- Treatment approaches: The Medical Model informs various approaches to addiction treatment, including medication-assisted treatment, behavioral therapies and support services. These interventions aim to address the biological, psychological, and social factors underlying addiction and promote long-term recovery

Critics of the medical Model argue that it oversimplifies the complex nature of addiction by focusing primarily on biological factors while neglecting the influence of social, cultural and environmental factors. However, proponents argue that understanding the neurobiological basis of addiction is essential for developing effective prevention and treatment strategies.

Discussion

Since its original introduction in 1960, many researchers have had doubts about the validity of the Medical Model of Addiction. The first reason is that the medical establishment was not receptive to the idea of "accepting" a "moral illness" as a valid medical disorder. The second reason for such a cautious rejection was the fact that, at that time, no pharmaceutical or clinical treatment protocols were developed to treat addiction successfully. Multiple attempts were made to validate or dispute the model.

While research by Sobel and Sobell found that only 30% of the cases examined in their study underwent the progression of alcoholism as postulated by Jellinek's model [8], the study of 636 inpatients conducted by Schuckit, Smith, Anthenelli, and Irwin confirmed that there was "clear evidence of progression in the severity of problems experienced by the alcohol dependent men in their research sample [4,9]. Like many theoretical innovations, the Medical Model of Addiction brought about new experimental concepts that resulted in the development of solid hypothetical models.

One such theory - the Genetic Predisposition Theory, postulated that many alcohol users are genetically predisposed to addiction. A milestone study by Cloninger et al., through the examination of 3000 adopted individuals, found solid evidence that "the children of alcoholic parents were likely to grow up to be alcoholic[s]" [4,10]. More recent research provided additional evidence that the Medical Model of Addiction provided a good direction for future theoretical developments in the medical field. A pharmacogenetic study by Li presented "compelling evidence" [11] of genetic predisposition towards alcoholism.

Like any theory, the Medical Model of Addiction has its opponents. The counterarguments are primarily based on the notion that addiction is a form of maladaptive response to an underlying psychological condition, such as depression or anxiety, and an expression of a "nonspecific inability to cope with the world" [12]. Holden, in an article published in the Canadian Medical Association Journal, argues that "There has been a steady erosion of individual responsibility and loss of any concept of personal blame for bad choices" [12] stated:

The statement in a CMAJ editorial [13] that addiction is a disease is not supported by the evidence and reads more like a political policy statement than a reasoned intellectual argument [12].

Furthermore, Kottow argued that:

- Addiction does not meet the criteria specified for a core disease entity, namely the presence of a primary measurable deviation from physiologic or anatomical norms [14]

Supporting this argument, Holden (2012) advocated for social intervention in addition to medical treatment on the basis that:

- Addiction is self-acquired and is not transmissible, contagious, autoimmune, hereditary, degenerative, or traumatic. Treatment consists of little more than stopping a given behavior [12]
- Medicalizing addiction has not led to any management advances at the individual level. The need for helping or treating people with addictions is not in doubt, but a social problem requires social interventions [12]

Indisputably, the biggest drawback to the Medical Treatment Model of Addiction is the lack of focus on patients' personal accountability and responsibility. Even though very few researchers and practitioners today challenge the nature of substance abuse as a medical problem, many practitioners feel that addiction treatment requires more than just medical and pharmaceutical care. Substance abuse occurs along with many forms of mental illness, making the treatment much more complex. The consensus among addiction professionals today unequivocally indicates that the most effective solution for substance abuse treatment is to address all of the contributing factors, including physical, mental and spiritual issues that lead to substance abuse to begin with. The Medical Model of Addiction did not address these elements when it was introduced in 1960.

Conclusion

The introduction of the Medical Model of Addiction in 1960 was essential in developing a new field of medical science - Addiction Medicine. At a time when many in the medical establishment viewed alcohol dependency as a moral failing, Jellinek and his team introduced a new scientific paradigm into medical science that would ultimately allow physicians to see other forms of addictive behavior as specific substance use disorders. While the medical Model of Addiction conceptualizes addiction as a chronic, relapsing brain disease characterized by compulsive drug seeking and use despite harmful consequences, the model highlights the biological and neurological changes that occur in the brain as a result of repeated substance use.

Regardless of the critical view that argues that the model oversimplifies the complex nature of addiction by focusing primarily on biological factors while neglecting the influence of social, cultural, and environmental factors, understanding the neurobiological basis of addiction is essential for developing effective prevention and treatment strategies.

Conflicts of Interest

The authors have no commercial conflicts of interest to disclose.

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