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THE HISTORY OF THE DISEASE CONCEPT OF SUBSTANCE DEPENDENCY

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THE HISTORY OF THE DISEASE CONCEPT OF SUBSTANCE DEPENDENCY

By

Brooke April Lewis

THESIS

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SIGNATURE APPROVAL FORM

THE HISTORY OF THE DISEASE CONCEPT OF SUBSTANCE DEPENDENCY

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ABSTRACT

THE HISTORY OF THE DISEASE CONCEPT OF SUBSTANCE DEPENDENCY

By

Brooke April Lewis

The nomenclature used to signify substance dependence has evolved throughout history. Previously, substance dependence was referred to as specific forms of mania, as addiction, and as a habit. The origins of the disease concept of substance dependence have been disputed. Benjamin Rush (1746-1813) and Thomas Trotter (1760-1832) have been credited as being the founders of the movement to acknowledge substance dependence as a disease. Through efforts of scientists of the 19th and 20th centuries, the concept of substance dependence as a disease has become widely accepted by professionals, the medical community, and the government. Significant contributors to this concept include T. D. Crothers (1842-1918) and E. M. Jellinek, (1890-1963) as well as groups such as the World Health Organization, American Society of Addiction Medicine, and the American Psychiatric Association. Criticisms (Gori, 1996; Jellinek, 1960; Peele, 1989) of this concept include the vagueness in definitions in addition to changes of these definitions of substance dependence over time. Considering substance dependence to be a disease is of importance due to the stigma often associated with the condition, which can be a barrier to treatment. Government policy has acknowledged substance dependence as a disease that requires treatment. Recognition of substance dependence as a disease has evolved over time and is advancing through further research on the subject.

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DEDICATION

This thesis is dedicated to Mom, Dad, Nana, and Nonno.

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INTRODUCTION

Addiction is defined by the Oxford English Dictionary as “immoderate or compulsive consumption of a drug or other substance;... a condition characterized by regular or poorly controlled use of a psychoactive substance despite adverse physical, psychological, or social consequences, often with the development of physiological tolerance and withdrawal symptoms” (“Addiction,” n.d.).

The American Society of Addiction Medicine (ASAM) currently describes *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. This is reflected in an individual pathologically pursuing reward and/or relief by substance use and other behaviors. Addiction is characterized by inability to consistently abstain, impairment in behavioral control, craving, diminished recognition of significant problems with one’s behaviors and interpersonal relationships, and a dysfunctional emotional response. Like other chronic diseases, addiction often involves cycles of relapse and remission. Without treatment or engagement in recovery activities, addiction is progressive and can result in disability or premature death (American Society of Addiction Medicine, n.d.-a).

According to Prus (2014), the disease model of addiction is considered to be comparable to the standard definition of *disease*, which the Encyclopaedia Britannica (Burrows, & Scarpelli, n.d.) describes as “a harmful deviation from the normal structural or functional state of an organism. A diseased organism commonly exhibits signs or symptoms indicative of its abnormal state.”

According to the *Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5)* (American Psychiatric Association, 2013a), there are 11 possible criteria used to diagnose substance use disorders. These disorders are described as mild, moderate, or severe (e.g., alcohol use disorder, severe or opioid use disorder, mild) (American Psychiatric Association, 2013c). Criteria for diagnosing substance use disorders are as follows: [1] taking the substance in higher quantities or for a longer amount of time than was anticipated, [2] desire to cut down use or control use, as well as possible failed attempts to do so, [3] spending a great deal of time seeking the substance, using the substance, or recovering from use, [4] cravings, or urges, to use, [5] affected social impairment, including failing to fulfill obligations, [6] social issues, [7] giving up on important activities because of use, [8] using substances in situations that are dangerous, [9] continued use despite knowing use could cause or worsen physical or psychological condition, [10] increased tolerance, and [11] withdrawals. The word *addiction* is not used because it is nondescript and also due to the negative implication associated with the term. The *DSM-5* describes the term substance dependence as being unbiased (American Psychiatric Association, 2013b).

The National Drug Control Strategy, somewhat redundantly, has recognized substance use disorders as both a brain disease and a medical condition (U.S. Office of National Drug Control Policy, 2014; U.S. Office of National Drug Control Policy, 2015). These documents address issues including, but not limited to, treatment of addiction and stigma associated with the condition. “Stigma, rooted in the misperception that a substance use disorder is a personal moral failing rather than a brain disease, is a major obstacle to drug policy reform” (U.S. Office of National Drug Control Policy, 2014, p.

19). The National Drug Control Strategy reported that the United States Government is a proponent for the recognition of substance use disorders as chronic diseases (U.S. Office of National Drug Control Policy, 2014). The policy explicitly suggested avoiding terms such as *addict*, *addiction*, *alcoholic* and the like, due to the negative connotations associated with these terms. A person with a substance use disorder is suggested as more appropriate terminology (U.S. Office of National Drug Control Policy, 2015). Concomitantly, the World Health Organization (2012) suggested a change in the terminology regarding substance dependence and persons with substance dependency issues.

The word *addiction* is derived from the Latin word “addict” meaning “assigned” (Stevenson & Lindberg, 2010a). Addiction was originally used to describe “assignment (of disputed property)” or “assigning of a debtor to the custody of his creditor” (“Addiction,” n.d.). Markel (2011) described the origins of the word addiction: “...typically referred to the bond of slavery that lenders imposed upon delinquent debtors or victims on their convicted aggressors. Such individuals were mandated to be 'addicted' to the service of the person to whom they owed restitution” (p. 7). By the 16th century, the word was used to describe devotion to someone or something (Stevenson & Lindberg, 2010a). In the 19th century, the term addiction shifted to being used to describe people engaging in “bad habits” (Markel, 2011) perhaps by semantic extension of the concept of “devotion to.”

Historically, addiction became the contemporary term to describe what was previously known as a *habit*, *inebriety*, or *morphinomania*. Habit is defined as a regular or repetitive behavior or tendency and is derived from the Latin term “habitus,” meaning

condition (Stevenson & Lindberg, 2010b). The term *inebriate* is synonymous with *drunkard* and also is used to refer to intoxication from alcohol. Inebriate is derived from the Latin words “inebriare” and “ebrius,” meaning “intoxicate” and “drunk,” respectively (Stevenson & Lindberg, 2010c).

Other words historically used to describe what is now known as substance dependence include the following: *morphinism*, *narcomania* (Crothers, 1902), *dipsomania*, *opium invalidism*, *opium habit*, and *alcoholism* (Markel, 2011). Those dependent upon substances were previously known as *alcoholists*, *morphinists*, (Crothers, 1902) *eaters*, as well as the commonly known term *drunkards* (Markel, 2011).

1700s-1800s

There is a dispute in the literature as to when the diagnosis of addiction as a medical condition was established. The concept of substance dependence as a medical concern was described as early as the 18th century. However, Markel (2011) indicated an addiction diagnosis was not present in medical literature until the end of the 1800s. Common use of the word addiction, according to Berridge and Mars (2004), was “first in widespread use in medicine in the early 20th century to describe compulsive drug taking” (p. 747).

In the late 18th century and early 19th century, two physicians, Benjamin Rush (1746-1813) and Thomas Trotter (1760-1832) provided detailed accounts of addiction as a disease. Benjamin Rush was an American physician and politician (Butterfield, n.d.). It is not clear whether Rush considered addiction to be a mental or physical disease, or both. Thomas Trotter was a Scottish physician. Trotter practiced as a surgeon, and also

served as physician to the British Naval Fleet. His research interests included mental illnesses and substance dependence (Cockburn, 1845).

Benjamin Rush first published his review on substance dependence in 1790, titled *An Essay on the Pernicious Effects of the Use of Ardent Spirits*, later revised under a different title: *An Inquiry into the Effects of Ardent Spirits upon the Human Body and Mind, with an Account of the Means of preventing, and the Remedies for Curing Them*. The last revised edition of this book, the eighth edition with additional revisions continued to be re-published until 1900.

Rush defined *ardent spirits* as liquor obtained from distillation of any fermented substance. In his *Inquiry* (1819), Rush described dependence upon ardent spirits as an “odious disease (for by that name it should be called)” (p. 5). Rush provided details regarding the effects of long-term use of ardent spirits:

1. A decay of appetite, sickness at stomach, and a puking of bile or a discharge of a frothy and viscid phlegm by hawking in the morning.
2. Obstructions of the liver....
3. Jaundice and dropsy of the belly and limbs, and finally of every cavity in the body. A swelling in the feet and legs....
4. Hoarseness, and a husky cough, which often terminate in consumption, and sometimes in an acute and fatal disease of the lungs.
5. Diabetes, that is, a frequent and weakening discharge of pale, or sweetish urine.
6. Redness, and eruptions on different parts of the body. They generally begin on the nose, and after gradually extending all over the face, sometimes descend to the limbs in all the form of leprosy. They have been called ‘Rum-buds,’ when they appear in the face. In persons who have occasionally survived these effects of ardent spirits on the skin, the face after a while becomes bloated, and its redness is succeeded by a death like paleness....
7. A fetid breath....
8. Frequent and disgusting belchings....
9. Epilepsy....
10. Gout....
- Lastly, 10. Madness.” (pp. 9-10)

Additionally, he provided a description of abnormalities observed in the human body following death in those who consumed ardent spirits in excess. It was believed that ardent spirits could destroy a person’s life even if he or she had never experienced

intoxication. In *Inquiry* (1819), Rush reported effects of excessive liquor consumption, such as memory impairment and moral deficiencies. “They produce not only falsehood, but fraud, theft, uncleanness, and murder” (Rush, 1819, p. 11). Details are provided as to how the estate of the person addicted to ardent spirits is neglected and derelict. Rush described the financial, social, and medical problems caused by chronic alcoholism: “Thus we see poverty and misery, crimes and infamy, diseases and death, are all the natural and usual consequences of the intemperate use of ardent spirits” (Rush, 1819, p. 13). Rush explicitly refers to death caused by overconsumption of alcohol as suicide (Rush, 1819).

In *Inquiry* (1819), the existence of “necessary” (p. 14) uses of alcohol suggested by others was refuted. These uses included using alcohol in cold weather to keep warm or using alcohol in warm weather to either make work easier or the heat more bearable. Rush (1819) also suggested that some individuals might be predisposed to alcohol addiction, just as some are predisposed to other diseases. He refers to ardent spirits as “the great destroyer of...lives and souls” (Rush, 1819, p. 27).

Rush estimated that at least 4,000 people died per year from the use of alcohol in the United States (Rush, 1819). At the time of the first census in 1790, the United States population was 3,929,214. This increased to 5,308,483 in 1800, and by 1810 the population was 7,239,881 (U.S. Bureau of the Census, 1975). Based on Rush’s estimate, between 1790 and 1810, only approximately .1% to .055% of the population was killed by alcoholism per year. Rush compared the death of 4,000 people from alcoholism to the death of 4,000 people in a year from the yellow fever (Rush, 1819) during the epidemic that occurred in Philadelphia, Pennsylvania in 1793 (Stough, 1939).

The following question was proposed by Rush: why did the deaths from alcohol consumption not arouse the same attention as the deaths from the yellow fever? He stated that these deaths from the yellow fever “awakened general sympathy and terror, and called forth...laws, to prevent its recurrence” (1819, p. 28). Rush suggested governing bodies should limit the number of establishments able to serve liquor; to enforce high taxes on liquor; “to inflict a mark of disgrace, or a temporary abridgement of some civil right upon every man convicted of drunkenness; and finally to secure the property of habitual drunkards...by placing it in the hands of trustees...appointed by a court of justice” (Rush, 1819, p. 28). Last, religious establishments were asked by Rush to aid in upholding the laws regarding liquor (Rush, 1819).

Thomas Trotter’s *An Essay, Medical, Philosophical, and Chemical on Drunkenness* was initially published in 1804, around 14 years after Rush’s *Inquiry*. A revised edition including corrections was published in 1813. Although Trotter’s publication followed Rush’s, Trotter’s *Essay* made no mention of Benjamin Rush, which is somewhat curious considering that Rush completed his medical education in Edinburgh, Scotland. Nevertheless, both definitions of drunkenness were similar. Trotter (1804) defined *drunkenness* as “the delirium occasioned by fermented liquors” (p. 8) and later, more descriptively, as “the offspring of habitual intoxication” (p. 12).

Drunkenness, at the time, had not been medically described or studied: “The habit of inebriation...has seldom been the object of medical admonition and practice” (Trotter, 1804, p. 3). In the opening pages of Trotter’s book, he stated “...the drunkard...has been allowed to perish, without pity and without assistance; as if his crime were inexpiable, and his body infectious to the touch” (1804, p. 3). Trotter (1804) considered drunkenness,

as well as habitual use of the narcotics “*opium* and *bang*,” (p. 10) as diseases.

For the purpose of this publication, Trotter (1804) chose to focus only on the disease of drunkenness because of its prevalence at the time. Trotter stated it was difficult to identify a set of symptoms of the disease of drunkenness, but nonetheless offered a remarkably descriptive collection of symptoms in his book. In a chapter titled “Definition of Drunkenness,” Trotter designated delirium as the “most certain, . . . most prominent, and general” (p. 8) symptom. Trotter reported that a comatose state accompanies this delirium, and that a common cause of death in a drunkard was apoplexy. *Apoplexy* was described as being “a privation of sense and motion, while respiration and the action of the heart and arteries remain” (Trotter, 1804, p. 97).

The second chapter of the *Essay* goes on to discuss the effects drunkenness can have on a person. His list of symptoms included nausea and vomiting, or in the absence of these gastrointestinal issues, a quick descent into sleep that is often accompanied by snoring. Trotter also provided a description of withdrawal symptoms from alcohol without referring to these symptoms as withdrawals (Trotter, 1804).

Trotter (1804) recognized that alcohol circulated in the blood and reported the scent of alcohol could be detected in the breath. An increase of blood flow within the brain was also described. Trotter (1804) perceived the causation of the commonly reported and observed comatose state as being attributed to this increased flow of blood to the brain (Trotter, 1804). He described deoxygenation of the blood, indicated by the darker color of the blood “of a professed drunkard” (p. 56). A symptom brought about by drunkenness also included blood vessels that appeared to be “clogged with a dense blood” (p. 43). Trotter (1804) reported that alcohol coagulated blood and other secreted

bodily fluids. Chronic consumption of alcohol can affect the physiology of blood, leading to increased risk for coagulation, also known as blood clotting (Ballard, 1997). The perceived anesthetic properties of alcohol were also described (Trotter, 1804).

Trotter (1804) reported that the liver was greatly affected by heavy consumption of alcohol. He believed that alcohol consumption hindered the healing of injuries. Trotter stated that those who consume alcohol in great quantities and over a long period of time had higher incidences of ulcers (Trotter, 1804). In point of fact, alcohol use disorders have been shown to significantly increase the risk of developing peptic ulcers (Goodwin, Keyes, Stein, & Talley, 2009).

A person's body did not return to its original state following the cessation of drunkenness according to Trotter (1804). Symptoms that continued included physical and emotional issues such as headache, nausea, lethargy, and sadness. Suggested remedies for restoring the body's condition included "pure air, animal food, and mental exhilaration" (Trotter, 1804, p. 44).

All people who have drunk alcohol are aware that the substance may cause a person to behave or speak in a manner that he or she normally would not. Therefore, Trotter contended that while the drunkard should still be held responsible for whatever acts he or she commits while intoxicated, perhaps consequences should be made less severe. The reason for this was the unlikeliness that an intoxicated person acted out some injustice based on a prior conceived notion. Trotter also provided a guide for interacting with "a drunken man" (Trotter, 1804, p. 93-94).

In his concluding chapter, Trotter (1804) chronicles the diseases and physical consequences that accompany alcohol consumption. These consequences included

seizures or convulsions, nightmares, hysteria, effects on the female menstrual cycle, and miscarriage. Trotter (1804) provided descriptions of diseases that accompany chronic drunkenness. He suggested that the disease of drunkenness developed gradually; at first the consumption may be enjoyable and later causes “nothing but disease and pain” (p. 176). These diseases included “*phrenitis, brain-fever, rheumatism, pleurisy*” (pp. 107-108), “*gastritis and enteritis*” (p. 108), inflammation of the whites of the eyes (“*ophthalmia,*” [p. 109]), which he described as a distinguishing feature of a drunkard, inflamed skin, tumors, and “leprous eruptions” (p. 110), hepatitis, gout, “*schirrus of the bowels*” (p. 112), indigestion, edema, “*emaciation of the body*” (p. 120-121), heart palpitations, diabetes, “*locked jaw*” (p. 124), tremors, ulcers, “*madness and Ideotism, (sic.)*” (p. 126), structural damage of the brain, “*melancholy*” (p. 130), impotence and diminished libido, advanced aging, and death. Other issues he reported as a result of drunkenness include effects on physical appearance and balance (Trotter, 1804).

The diseases described by Trotter (1804) were explained in great detail. The digestive tract of chronic drunkards was likely to be greatly affected by heavy consumption, due to alcohol passing through the digestive system. He recognized that obesity as well as “fullness” (1804, p. 43) were common occurrences following habitual intoxication. He stated that after a certain point in the drinker’s disease, the damage to the body could be irreversible (Trotter, 1804). In regards to reparation of the liver following chronic drunkenness, Trotter (1804) indicated that it was possible for the liver to heal following sustained abstinence: “Feb. 24. I have at present a patient just recovering from *diseased liver and jaundice*; who by giving up the vinous stimulus at once, has been miraculously snatched from the verge of the grave!” (1804, p. 116).

An increased tolerance was described in individuals who subjected their bodies to heavy alcohol consumption over long periods of time. Edema was suggested to be an indicator of impending death of the drunkard. The cause of edema was reported as being due to an increase in the production of bodily fluids and a decrease in the body's ability to absorb the fluids. Trotter (1804) reported that not only is the drunkard's appetite affected but his or her body's ability to absorb nutrients is also affected.

Trotter (1804) referred to drunkenness as a "temporary madness" (p. 127) and stated, "the habit of intoxication belongs to the mind" (pp. 176-177). He indicated that "drunkenness, is like some other mental derangements..." which require care from medical professionals. The mental condition ("insanity" [p. 127]) of drunkenness could last for weeks or months especially if the individual has a predisposition to insanity. Brain or head wounds, lesions, or contusions were reported to have effects similar to the insanity he described in the drunkard. Trotter (1804) attributed the cause of delirium in these subjects to either an over-accumulation or uneven circulation of blood in the head.

The effects of alcohol on children were described as being similar to the effects on adults (Trotter, 1804). The effects on infants that were given alcohol by nurses to aid in sleep were explained: "such children are known to be dull, drowsy, and stupid; bloated...eyes inflamed, subject to sickness at stomach, costive, and pot-bellied" (p. 134). Trotter (1804) suggested must have also been present in a nursing mother's breast milk if she has been ingesting alcohol. He reported that physicians at this time did not emphasize the hazardous consequences of consuming alcohol whilst breastfeeding (Trotter, 1804). Trotter's understanding alcohol and breastfeeding was advanced for this time, as it has been shown that alcohol is present in the breast milk (Lawton, 1985).

Trotter (1804) asked, "...are not habits of drunkenness more often produced by mental affections than corporeal diseases?...Does not the inebriate return to his potation rather to raise his spirits, and exhilarate the mind, than to support and strengthen the body?" (1804, p. 179). Trotter's proposed treatment for chronic drunkenness was that the drunkard entirely cease consumption of any beverages containing alcohol. In addition, an explanation was provided of treatments for the aforementioned ailments associated with drunkenness. If a person died after achieving sobriety, that the cause of his or her death was the lengthy duration of alcohol consumption, "which rendered his disease incurable" (Trotter, 1804, p. 179).

In comparison, the approach of Trotter in his *Essay* is much more humane than the approach of Rush in his *Inquiry*. Rush seems to take a more religious-oriented approach towards alcohol, often referring to it as "evil." He was a proponent for punitive measures in order to endorse abstinence. Rush believed shame should be imparted upon the drunkard, whereas Trotter supposed the drunkard to be a person with a disease deserving of treatment and sympathy, while nonetheless still suggesting the drunkard be held responsible for his or her own actions.

Edwards (2011) indicates that although others before Trotter began to view habitual drunkenness as a disease, none of his predecessors produced any literature or research on the subject. Although Trotter's work was not entirely his own idea, his essay on habitual drunkenness was "an original contribution" (Edwards, 2011, p 1565).

Differences between Trotter's and Rush's approaches exist. Particularly, "Rush did not enunciate the idea of learnt habit as 'disease of the mind' as distinctly as did Trotter, and he did not show the same kind of innate clinical sensitivity as did Trotter, nor did he

show Trotter's evident gifts of empathy toward his patients" (Edwards, 2011, p 1565).

Rush, rather than Trotter, was credited in the medical community for the development of the disease concept of alcoholism (Edwards, 2011). Trotter's book did not receive as much attention as Rush's. Rush's signature is one on the United States Declaration of Independence, and Rush also served as Surgeon General. Although Trotter was known for his involvement in the British Navy, evidently he was not as renowned as Rush. Rush also campaigned against alcohol consumption, whereas Trotter did not do any advertisement of the subject or of the book itself (Edwards, 2011). Edwards (2011) also suggested that the Temperance Movement in America helped to promote Rush's idea, whereas the British were not opposed to consumption of alcohol at the time of Trotter's publication.

Nearly a century after Rush's and Trotter's publications, Thomas Davison Crothers, M. D., (1842-1918) described addiction to drugs and alcohol in several books. In 1893, *The Disease of Inebriety from Alcohol, Opium and Other Narcotic Drugs, its Etiology, Pathology, Treatment, and Other Medicolegal Relations* was published. According to Crothers (1893), a group of physicians formed the American Association for the Study and Cure of Inebriety. This organization was established in 1870, in New York, New York. Among their principles, this association referred to inebriety as a curable disease. Members of the organization had publications on the subject of substance abuse and dependence. In 1877, the *Quarterly Journal of Inebriety* began. Physicians who had a large impact on the disease concept of inebriety are mentioned and their contributions described. It is noted that both American and European scientists published literature on the subject (Crothers, 1893).

Not only did Crothers (1893) refer to inebriety as a disease, he reported this as a fact. He referred to the study of inebriety as a scientific branch of study. The novelty of the idea was acknowledged, and the author encouraged others to explore the subject as little research had been done on inebriety as a medical condition. The intent of this 1893 book was to present research on behalf of the formerly mentioned Association (Crothers, 1893).

Ancient descriptions of substance dependence as well as research over the past hundred years were described (see Crothers, 1893, pp. 18-21). Also described was the establishment of treatment centers for inebriates. Two classifications of inebriety were designated: *dypsomaniacs* and *inebriates*. Within the inebriate classification, there are many classes described, and within dypsomaniacs there are different forms.

Classes of inebriates described by Crothers (1893) included *accidental*, *emotional*, *solitary*, and *pauper* inebriates. Accidental inebriates drank only in certain environments or situations and remained sober in others; additionally, some in this category drank in an attempt to alleviate physical ailments. Emotional inebriates were those who drank in an attempt to relieve their mental instability. Those who drank at night, alone, or in secret were referred to as solitary inebriates. The inebriates considered to be the underbelly of society were termed pauper inebriates (Crothers, 1893).

Acute, *periodic*, and *chronic* were the designated forms of dipsomania. Acute was described as being infrequent, periodic as being common, and chronic as the most common. Acute dipsomania was the result of some strain—emotional, physical, or mental—experienced by the person.

The periodic dypsomaniac experienced bouts of intoxication, varying in duration.

The friends or family of the periodic type could determine when a bout was near, as the demeanor of the person would change. This type of dypsomaniac would experience cravings, withdrawal symptoms, and relapses after periods of sobriety. Periodic inebriety was progressive in nature and described as having some sort of hereditary etiology. Another potential cause of this type of inebriety was a head injury. The presence or absence of morality had an effect on the ability, or lack there of, to achieve sobriety (Crothers, 1893).

Chronic dypsomania reportedly began around the age of 17 or 18 and would often cause death in these dypsomaniacs before the age of 30. The chronic type were rarely, if ever, sober. Chronic dypsomaniacs would attempt to decrease consumption, but were unable to do so. The health was affected. The chronic dypsomaniac would drink in order to be able to get some sleep, though such sleep was never of quality. Delirium tremens were possible. Other effects included red face and neck, watering eyes, heavysset body, bloody noses, liver damage, and damage to the brain (Crothers, 1893).

Crothers (1893) provided descriptions of potential causes of inebriety, including head and spinal injuries. Also listed as predispositions include epilepsy, heart conditions, hepatitis, melancholy, and fevers. Exhaustion, whether physical or mental in origin, was cited as another potential cause. The seasons, cosmos, and barometrical pressure were reported as additional factors that could lead to development of inebriety (Crothers, 1893).

The genetic predisposition to alcohol dependency is referred to by Crothers (1893) as “alcohol heredity” (p. 145) Crothers stated “There must...be a predisposition to inebriety in order to effect its evolution” and also, “Hereditary influences are among the

most potent that determine this disease...” (p 242). Different different types of this alcohol heredity were designated: *direct*, *indirect*, and *complex borderland*. The direct inebriates inherit the condition from their parents and grandparents, typically passed to the progeny of the opposite sex. One-third of inebriates were reported to be of this type. Indirect inebriates resulted from minor mental conditions in other generations of the family that eventually led to inebriety in the offspring. The borderland cases were reported to make up one-fourth of inebriates, and were the result of severe mental illnesses in preceding generations. Physical and mental ailments would be present in the offspring of inebriates (Crothers, 1893).

Crothers (1893) stated that the blood of a chronic inebriate contained alcohol, as did the cerebral spinal fluid, the urine, and breast milk of nursing mothers. The effects on the bodily organs, including the kidneys, liver, and nervous system were described. Also described were findings from animal studies that Crothers (1893) reported as evidence of the hereditary nature of the disease and the health effects of chronic alcohol consumption.

The Disease of Inebriety from Alcohol, Opium and Other Narcotic Drugs, Its Etiology, Pathology, Treatment, and Other Medicolegal Relations (1893) provided great detail about inebriety from alcohol and other drugs. This included the effects on the mind and body, as well as descriptions of research findings from this time period and earlier. The inebriety from other drugs was also chronicled in his later book, published in 1902 (Crothers, 1902a).

1900s-Present

A book by Crothers titled *Morphinism and Narcomanias from other Drugs, Their Etiology, Treatment, and Medicolegal Relations* was published 1902. At the time of this

publication, Crothers was president and superintendent of Walnut Lodge Hospital in Hartford, Connecticut (Crothers, 1902a; Shrady, & Lathrop, 1918). He was also the Editor of the Journal of Inebriety (Crothers, 1902a) beginning in 1876 (Shrady, & Lathrop, 1918), as well as a Professor of Mental and Nervous Diseases at the New York School of Clinical Medicine (Crothers, 1902a), and a dean (Shrady, & Lathrop, 1918). Crothers specialized in addiction research and treatment (Shrady, & Lathrop, 1918).

In Crothers's (1902a) book, he described *opium mania* as "a very old disease" (p. 5), referring to addiction to opium and referred to addiction to morphine ("morphin") as "*morphinomania*, a modern form of the same disease" (Crothers, 1902a, p. 5). Crothers reported there were few publications at the time that examined morphinomania and narcomanias¹; the publications that did exist focused primarily on treatment methodology rather than etiology or symptomology (Crothers, 1902a). Crothers provided an explanation of *morphinism* in the second chapter of his book:

...a condition following the prolonged use of morphin (sic.) either by the needle under the skin or in solution by the mouth. Morphinomania is a term used to designate the condition of persons in whom the impulse to use mophin (sic.) is of the nature of a mania, possessing the mind and dominating every thought, leaving but one supreme desire-to procure morphin (sic.) and experience the pleasure it gives. Such a person insists on relief at once, and is not contended with anything less." (p. 42)

The history of opium and morphine were described by Crothers (1902a), including a citation of a 1901 publication that described the discovery of morphine derived from opium first in 1804. The derivation of morphine from opium was overlooked until 1817. Morphine was introduced to the United States in the late 1830s and early 1840s (Crothers, 1902a). Another well-known derivative of opium mentioned

¹ "Chloralism," "chloroformism," "coffee addiction," "tea inebriety," "tobacco inebriety," and "addictions from other drugs" were also described by Crothers (1902a).

by Crothers (1902a) is codeine.

Crothers (1902a) described a distinction between morphine and opium. While he compared opium addiction to morphinism, he suggested that addiction to opium was less likely than addiction to morphine and that there were differences in symptomology. Addiction to opium was considered a more gradual process and a less severe condition than addiction to morphine. He suggested that the opium-eater might be more able to conceal his addiction than the morphinist. Methods of use (oral, injecting, smoking) were addressed and individual differences among those addicted were considered (Crothers, 1902a).

In 1846, *The Lancet* expressed concerns of the danger of morphine addiction, which Crothers described as a “first warning” (1902a, p. 26) against the use of morphine. Its use was popularized by the introduction of the hypodermic needle (Crothers, 1902a). Continued use after multiple injections of morphine was attributed to the “weak will” (Crothers, 1902a, p. 27) of the patient and considered unusual incidences.

Morphinism was referred to as a “modern disease” (p. 33), and Crothers (1902a) warned of the dangers it could pose society. Like his predecessors, Crothers (1902a) provided proposals for treating morphinism, including the use of placebos such as injections of water rather than of morphine. This was suggested as a means of ending the habitual use of morphine, despite reporting that individuals continued to inject water over long periods of time as a treatment (Crothers, 1902a).

Some descriptions of the disease of morphinism that are comparable to current diagnostic features of substance use disorders: Crothers (1902a) reported individuals often continued to use morphine “with apparent unconsciousness of the dangerous

consequences” (p. 46). Crothers did not believe morphinism was a moral corruption but rather a physical ailment: “No study of moral causes should be considered by a physician, . . . The present knowledge of the physiology and psychology of the brain has indicated no causes other than physical in the development of morphinism” (Crothers, 1902a, p. 56). Additionally, addiction was described as a hereditary disease. He provided in depth descriptions of cases of individuals considered to be morphinomaniacs or morphinists, and also described predispositions (both physical and mental) to morphinism, symptomology, and effects of long-term use on the brain and body.

Some effects of the use of morphine reported by Crothers (1902a) included: anemia, cognitive impairments, fatigue, dilated pupils, tearful eyes, skin paleness, lack of expression of emotion, constipation, dry mouth and thirst, gastro-intestinal issues, edema, presence of morphine in urine, dishonesty, paranoia and delusions, personality changes, stealing, lack of sexual desires, heart and lung problems, and premature aging. In the absence of use of morphine after prolonged use, symptoms may become worse or other symptoms may become present. Descriptions of withdrawals included headache, nausea, malaise, as well as the mention of cravings and continued use of morphine to avoid the symptoms of withdrawal from the substance (Crothers, 1902a).

Individuals addicted to morphine were unlikely to survive a constant ten-year habit according to Crothers (1902a). He also reported dangers associated with substituting morphine for alcohol, indicating that symptoms would worsen. Crothers (1902a) reported that if someone addicted to morphine were to deny his or her continued use, he or she was likely being dishonest.

Similar to Rush and Trotter, Crothers (1902a) addressed the question of legal

ramifications for addicts. A “medical decision” (p. 230) was suggested in these cases to determine the responsibility of the individual. He argued that the physiological effects on the brains and bodies of these individuals was the reason behind their proposed inability to be responsible persons in that mental faculties, character, personality, and health is totally altered by the use of these substances (Crothers, 1902a).

Another condition described by Crothers (1902a) was *cocainism*. Twenty years after the first description of cocaine as a local anesthetic, an account had been given of cases of cocainism. Crothers (1902a) indicated that this was the first time cocainism was recognized and that cocainism was not considered a disease by many. Cocainism was referred to as a “new disease,” (p. 273) similarly to the consideration of morphinism as a “modern disease” (Crothers, 1902a, p. 33). The stimulating and anesthetizing properties of cocaine were described and included hyper-verbal speech, perceived increased strength, as well as decreased or non-existent pain as some of the effects of cocaine. Ultimate effects of chronic use of cocaine included insomnia, imagined sensations of bugs crawling on the skin, decreased appetite, and anemia. Concluded was that cocainism was very dangerous, increasing in incidence, and that there had been very little research or belief of the condition at that time. With treatment the prognosis could be hopeful for cocainism (Crothers, 1902a).

The conclusion of Crothers (1902a) was that the substances he chronicled in his book were among “the most prominent and dangerous of the many drugs which are used for their...effects until their use becomes a veritable mania” (p. 339). The study of addiction was proclaimed to be a new area of exploration in regards to psychopathy and encouraged evidential work to discover a remedy for the ailment of addiction. Although

not always explicitly stated, it is implied that Crothers (1902a) considered all of the addictions mentioned in his book as diseases.

At the beginning of the 20th century, a second book by Crothers was published, titled *The Drug Habits and Their Treatment: A Clinical Summary of Some of the General Facts Recorded in Practice*. Crothers (1902b) referred to substance dependency using both the terms habit and disease. Specified was that the word *habit* in this context described “a physiological and psychological tendency to repeat the same acts apparently outside of the control of the will (Crothers, 1902b, p. 9). Similarly to his other books, he described alcoholism, opium addiction, the damaging effects of alcohol, as well as addictions to other substances such as cocaine as diseases (Crothers, 1902b).

A number of factors contributed to the popularization of the disease concept of addiction in the 20th century. Alcoholics Anonymous is considered to be a significant contribution to the spread of the disease concept. According to Jellinek (1960), purportedly AA was under the impression that the description of alcoholism as a disease was a novel idea, when in reality it had been around for more than a century. Nonetheless, the attention AA received brought awareness of the disease concept to the public and professionals (Jellinek, 1960). Dr. Bob Smith (1879–1950), known as Dr. Bob, a physician and recovering alcoholic, along with a fellow recovering alcoholic Bill Wilson (1895-1971) founded Alcoholics Anonymous (AA) (“Alcoholics Anonymous,” n.d.). Bill Wilson was a New York stockbroker and Dr. Bob was a surgeon. The pair met in Akron, Ohio in May of 1935 and formed a plan of action to help others in the same predicaments. In 1939, *Alcoholics Anonymous: The Story of How Many Thousands of Men and Women Have Recovered from Alcoholism*, known as the *Big Book*, was first

published (Wilson, 2001). The personal story of Bill W. is chronicled in Chapter 2, titled “Bill’s Story” (p. 1) and Dr. Bob’s story is in the section of Personal Stories, titled “Doctor Bob’s Nightmare” (p. 171) (Wilson, 2001).

William D. Silkworth, M. D. (1873-1951) was a psychiatrist who specialized in the treatment of addiction to drugs and alcohol (Wilson, 2001). Dr. Silkworth authored a letter and a statement that are included verbatim in a section of AA’s *Big Book* titled “The Doctor’s Opinion” (Wilson, 2001, p. xxv). The letter was requested by the AA program and provided support for AA’s purpose and approach (Wilson, 2001).

Dr. Silkworth characterized alcoholism as an illness and specifically, he described alcoholism as an allergy (Jellinek, 1960; Silkworth, 1937a; as cited by Wilson, 2001). He did not believe or support the idea the alcoholic had a problem of mental control. Once the condition had been formed, Dr. Silkworth reported that an alcoholic could never drink in moderation again; abstinence was required for recovery (as cited by Wilson, 2001).

Craving was a feature noted that defined the chronic alcoholic (Silkworth, 1937a; as cited by Wilson, 2001). Other symptoms that accompanied alcoholism included anxiety, sleeplessness, and absence of hunger (Silkworth, 1937a). He also provided a description of the withdrawal symptoms from alcoholism, including fever, perspirations, hypertension, and tremors (Silkwork, 1937b). According to Silkworth, (1937a), some individuals were born with this allergy, but the allergy gradually manifested later in life.

Silkworth supported the AA ideology that the alcoholic must come to believe in a power greater than him or her in order to have successful recovery from the disease (as cited by Wilson, 2001). Implied in Silkworth’s statement (as cited by Wilson, 2001) was that Bill W., one of the founders of AA, was in fact a patient in his hospital, and it was at

this hospital where Bill W. began what would become AA.

Treatment procedures for chronic alcoholics were described by Silkworth (as cited by Wilson, 2001). Hospitalization for medical treatment was suggested and ought to precede any psychological treatment (See also Silkworth, 1937b). The alcoholic would need to change his or her entire mindset. Silkworth (as cited by Wilson, 2001) reported he had not seen anything work as well to resolve the allergy as the help AA provided to alcoholics.

In the following years, The World Health Organization (WHO) began making contributions to the advancement of the disease concept of substance dependence. Alcoholism was pronounced a disease by WHO in 1951, but a clear description of the disease was not provided. In order to provide a more precise description of the medical condition, the WHO conceived that knowledgeable professionals should confer on the subject. To address this, a special committee was organized in 1953 and composed of pharmacologists and physiologists (World Health Organization, 1955).²

In 1955, the WHO released a report of information addressed during a convention a year prior. In this report, it was acknowledged that other professionals did not exhibit a willingness to consider alcoholism a medical concern, although it was accepted that the conditions that arise from the complications of alcoholism were considered to be diseases:

While the physical and the mental sequelae of alcoholism have been recognized as medical disorders, there has been—outside the circle of specialists—much less readiness to regard as a matter of medical concern of the behavior which results in these complications. (WHO, 1955, p. 3)

² For a list of World Health Organization Committees and other organizations that were important to the development of the disease concept of substance dependence, see Table 1.

The WHO argued that in order to make progress towards recognition of alcoholism as a medical disease, scientists needed to communicate as well as come to a general consensus on some issues (World Health Organization, 1955). In 1955, the WHO report summarized in detail cravings, withdrawal symptoms, inability to stop drinking and loss of control, alcoholic amnesias or blackouts, comparison of alcohol addiction to opiate addiction as well as classification and public-health implications of alcohol-related disorders. One year prior, the American Medical Association (AMA) had declared alcoholism as an illness (American Medical Association, n.d.). A numeric classification system of the alcohol-related disorders, ranging from acute intoxication to disorders associated with chronic use of alcohol was described in the 1955 report (World Health Organization, 1955). Some of the criteria for these classifications are similar to those of the DSM-5 (American Psychological Association, 2013b) criteria for substance use disorders, including loss of control and symptoms of withdrawal from alcohol (e.g., hallucinations, tremors, seizures) (World Health Organization, 1955).

Periodically, the WHO revised descriptions of addiction and related terms. In a 1957 WHO report, a description was provided of *addiction* and *habituation*, making a distinction between the terms. Addiction encompassed the compulsion to use, increased tolerance, psychological and physical dependence on the drug, and negative effects on self and others. Habituation differed in that the desire to use was not compulsive; the quantity of the substance did not typically increase, there was an absence of physical dependence, and negative effects on others were not present. Discontinuation of using the term *habit-forming* when referring to drugs was suggested, due to the distinction between addiction and habituation. Further, the meaning of habit-forming pertains to addiction

and not habituation (World Health Organization, 1957). Even earlier than 1957, the WHO mentioned these distinctions between a habit and addiction (WHO, 1950; WHO, 1952).

A contributor to the disease concept of alcoholism of the same era was E. M. Jellinek (1890-1963). Jellinek published his book entitled *The Disease Concept of Alcoholism* in 1960. He was a researcher of alcoholism and an advocate for the conceptualization of the disease model. In the United States, he began researching alcoholism at a Massachusetts hospital in 1939. He later conducted research and taught at Yale and Stanford Universities (“Elvin M. Jellinek,” n.d.).

Thomas Trotter and Benjamin Rush were referred to by Jellinek as “forerunners of a movement” (1960, p. 1). It was indicated that both were influential in the study of the disease of addiction. However, Trotter’s and Rush’s notions of addiction as an illness did not make impressions until nearly a century later (Jellinek, 1960).

According to Jellinek (1960), an organization of the AMA referred to as the American Medical Association for the Study of Inebriety and Narcotics had minimal success. Also having little success was this group’s *Journal of Inebriety* (Jellinek, 1960). Neither the AMA for the Study of Inebriety and Narcotics nor the *Journal of Inebriety* gained much attention from the public, nor from other professionals in the field (Jellinek, 1960).

Several explanations as to why the journal, The Society, and the disease concept had little success were provided by Jellinek (1960). Historical explanations of the disease of addiction were described as being vague. Also, it was suggested that the Temperance Movement hindered the advancement of the disease concept since it did not coincide with

Temperance ideology of the time. Consequently, the disease concept was not popular with the general public because of the apparent support the public had for Temperance philosophy. Although the Temperance movement acknowledged the disease concept, it was rejected by the protagonists of the movement (Jellinek, 1960).

Another reason cited for the disease concept lacking in acceptability was that only a minority of physicians specialized in the field of substance abuse rather than the more typical range of physicians, researchers, and professionals (Jellinek, 1960). “Exaggerated sentimentalism” (p. 7) was stated by Jellinek (1960) as another reason the medical community did not accept the disease concept. Years prior to this, Silkworth argued that if others perceived the psychiatrists who treated the disease to be too sentimental, they should experience the effects alcoholism has on individuals and their families. The potential solution for alcoholism that AA proposed was cited as a reason Silkworth was in support of the program (as cited by Wilson, 2001).

Physicians’ knowledge regarding alcoholism as a disease increased, which co-evolved with more advanced capabilities to treat alcoholics at various stages (Jellinek, 1960). Jellinek (1960) argued this was crucial to the treatment of alcoholics, since hospitals previously denied admission or treatment to those who suffered, as the disease was not characterized as a medical concern. Research was being conducted on alcoholism (Jellinek, 1960). Studies of nutrition and metabolism involving alcohol began to increase the understanding of alcoholism as a disease (Jellinek, 1960). Additionally, the clarification of the definition of the disease model increased acceptance of the concept; however, there was still not complete agreement on a description. This lack of agreement was perceived as an indication that there were, in fact, different types of alcoholism

(Jellinek, 1960).

Jellinek (1960) contended that there was prior, and at the time of his publication, need for an objective description of alcoholism. He described alcoholism as “*any use of alcoholic beverages that causes any damage to the individual or society or both. Vague as this statement is, it approaches an operational definition*” (p. 35).

There were several distinguished types of alcoholism, according to Jellinek (1960), and he refers to these types as species. These species were labeled *alpha*, *beta*, *gamma*, *delta*, and *epsilon* alcoholism. He provided descriptions of these species of alcoholism with the exception of *epsilon* alcoholism, as it was the “least known” (Jellinek, p. 39). It seems that Jellinek (1960) considered only *gamma* and *delta* alcoholism as diseases. Despite this, he considers alcoholics to be individuals possessing any of the species of alcoholism and again reiterated his operational definition of alcoholism: any drinking that causes harm.

Jellinek (1960) indicated the loss of control present in some of these species advanced progressively. Since addictions to morphine, heroin, and barbituates could also lead to cravings, these addictions could also be designated as diseases. At the time of Jellinek’s publication, the American Medical Association (AMA) considered both alcoholism and addictions to morphine, heroin, and barbituates to be diseases (Jellinek, 1960). In addition to descriptions of the species, descriptions of the disease concept from a variety of viewpoints were provided (e.g., psychological, physiological, and pharmacological) (Jellinek, 1960).

The WHO continued to change the terms used to describe substance dependence. The term *drug dependence* was first introduced by the WHO in 1964 as an attempt to

further clarify the previous definitions of addiction. Cited as reasoning for this was continued confusion regarding addiction and habituation. The term was intended by the WHO to refer to both addiction and habituation, contradictory to its previous attempts to delineate the two as separate conditions. Also described in this report are the dependencies upon different types of substances and the respective symptoms (World Health Organization, 1964). In 1965, the difference between dependence on and abuse of substances was described: *substance abuse*, or excessive use of drugs or alcohol, did not equate to *dependency* (World Health Organization, 1965).

Again, in 1974, the WHO re-defined *dependence* upon substances. Dependence then referred to psychological and physical changes attributed to use of drugs or alcohol. The WHO reported tolerance might not be present. Compulsion or cravings and use of substances to avoid symptoms of withdrawal were included in the 1974 definition. Also provided are definitions for both physical and psychological dependence (World Health Organization, 1974).

In 1993, the WHO report replaced the term *abuse* with the term *harmful use*. The definition of substance dependence by the WHO was compared to the definition of the *International Classification of Mental and Behavioral Disorders. Clinical Descriptions and Diagnosis Guidelines* published the year earlier. The WHO reported the definitions did not have discrepancies. Also provided were details about withdrawal, tolerance, and drugs capable of producing drug dependency (World Health Organization, 1993). A criticism of the WHO organizations was its evolving, increasingly vague descriptions of substance dependence (Gori, 1996).

Beginning in 1990, physicians could be trained and practice as Addiction

Specialists acknowledged by the American Medical Association (American Society of Addiction Medicine, n.d.-c). Addiction Specialists can now be certified by either The American Board of Addiction Medicine (ABAM), founded in 2007 (American Board of Addiction Medicine, n.d.), or the American Academy of Addiction Psychiatry or both (American Society of Addiction Medicine, n.d.-c).

Criticisms of the Disease Concept of Addiction

There have been multiple criticisms of the disease concept of addiction. Mentioned by several authors (Gori, 1996; Jellinek, 1960; Peele, 1989) is that the description of addiction or addictive disorders have been vague. Other criticisms include the belief that addiction is a voluntary behavior or choice. In the late 1990s, one of the same issues regarding addiction reported 40 years earlier (World Health Organization, 1955) was still present: the public views of addiction as merely a social problem was drastically different from the medical understanding of addiction as a disease that in turn resulted in social consequences (Leshner, 1997).

Peele (1989) provided many persuasive arguments refuting the disease concept of addiction. Addiction was referred to by Peele (1989) as a blanket-term and asked what the “addiction industry” (p. 4) intends on accomplishing. From a medical standpoint, Peele (1989) contended by seeking a biological cure for both addictions and mental health issues, medicine was going in the wrong direction; the reasoning behind this was that medicine did not know the cause of these disorders to begin with. He denied that the medical profession knew how to prevent and treat mental health issues and addiction (Peele, 1989).

In the book of Alcoholics Anonymous, a comparison of addiction and cancer was

made, referring to both as *illnesses*:

An illness of this sort—and we have come to believe it an illness—involves those about us in a way no other human sickness can. If a person has cancer all are sorry for him and no one is angry or hurt. But not so with the alcoholic illness, for with it there goes annihilation of all the things worth while in life. It engulfs all whose lives touch the sufferer's. It brings misunderstanding, fierce resentment, financial insecurity, disgusted friends and employers, warped lives of blameless children, sad wives and parents—anyone can increase the list. (p. 18)

On the other hand, without making reference to Alcoholics Anonymous, Peele (1989) argued that cancer does not go into remission based on a behavioral change, whereas to eliminate alcoholism, one changes his or her behavior by ceasing to drink.

Peele (1989) referred to the disease concept of addictions as being “bad science” (p. 26) as well as “morally and intellectually sloppy” (p. 26). “People’s belief that they have a disease makes it less likely that they will outgrow the problem,” (p. 27) stated Peele (1989). Additionally, it was argued that the disease concept eliminates the obligation of taking responsibility along with experiencing consequences for one’s actions (Peele, 1989).

Treatment of addiction was argued as being typically involuntary, and when chosen, the purpose was to receive services in lieu of jail or some other negative consequence (Peele, 1989). Peele (1989) even reported that the disease concept resulted in even higher numbers of addictions, which he referred to as behaviors. It should be noted that Peele (1989) provided no citation or data following this claim, but citations are present for other information in his book.

In order to reduce the incidences of addiction, Peele (1989) suggested people ought to teach appropriate behavior to their children, as children are capable of learning this by appropriate socialization. Otherwise, he claimed the medical field would continue

to try to treat an issue that is not of medical concern. People have quit smoking or lost weight without treatment, the author contended, therefore people with drug or alcohol addictions do not need any sort of treatment (Peele, 1989).

Harm-reduction has been cited as a crucial reason for substance use disorder treatment (Goldstein 1994; O'Brien & McLellan, 1996). Chronic conditions such as asthma and arthritis require on-going treatment; similarly, substance use disorders are chronic and therefore long-term treatment may be necessary in order to alleviate symptoms or to reduce risks associated with the condition. Additionally, the effects of substance use disorders do not disappear after an individual becomes abstinent. These negative effects, if not addressed, can contribute to the individual's relapse to substance use. Identifying ways in which to manage the effects substance use disorders cause is a reason treatment is beneficial. Treatment has also been associated with better outcomes in comparison to (Goldstein, & McLellan, 1996).

Levy (2013) agreed that "pathological neuropsychological dysfunction" (p. 1) is present in addiction, but argued that many other behaviors also produce changes in the brain. Addiction could not be considered a brain disease based on the consideration of brain dysfunction alone; in addition, this dysfunction must be present "in almost every accessible environment" (p. 1), meaning that the dysfunction could hardly—or not at all—be avoided (Levy, 2013).

Addiction as a disease has been criticized and considered to be of other origins. Addiction has also been considered as a moral decision or behavioral issue. Although behaviors change remarkably throughout the course of an addiction, the physiology and chemistry of the addicted brain changes considerably with prolonged use.

Additional Support of Disease Concept of Addiction

Leshner (1997, 2001) described addiction as a brain disease characterized by craving, seeking, and using drugs compulsively and negative consequences that do not impede drug or alcohol use. Also reported by Leshner (2001) is that the disease is both biological and behavioral. The addicted person first made an initial decision to use a drug or alcohol, but once the mechanisms of the brain were changed by chronic drug use, the person eventually lost the power of choice over drugs or alcohol. The resulting behavioral changes were reasoned to be a result of the changes in the “highjacked” (sic.) (p. 75) brain. Also mentioned is the heritability of the condition (Leshner, 2001).

Similarly to the belief of Thomas Trotter (1804), Leshner (2001) contended the addicted person was still responsible for his or her actions. Just as a person makes the first choice to pick up a drug or drink, he or she must put forth effort to become a person in recovery from an addiction. The person is viewed as a responsible party in his or her condition, in that he or she has the power to seek help for the condition. Contrary to the argument of Peele (1989), Leshner (2001), O’Brien and McLellan (1996) contended conditions such as diabetes or heart disease can be somewhat attributed to the behavior of the person. As an example, a lack of exercise and habitual over-eating can lead to either condition.

According to Leshner (2001), “addiction should be understood as a chronic and recurring illness” (p. 76). Arguing against the suggestion that addiction is an entirely behavioral issue, Leshner (2001) mentioned conditions such as Alzheimer’s Disease and Schizophrenia, which both could result in considerable behavioral changes. Similarly, Leyton (2013) reported that conditions such as phobias, Schizophrenia, and Post-

Traumatic Stress Disorder sometimes or always require some exposure to a particular stimulus, as the addiction process initiates with the first use of a drug. Addiction is compared to mental health disorders and physical disorders by Leyton (2013), and the author contended that addiction is similar while having distinctions of its own. Additionally, research of addiction contradicted the notion of addiction being a lack of willpower or character fault (Leshner, 2001).

Substance dependence has also been compared to infectious diseases; some individuals may have higher susceptibility to developing a substance use disorder. People who have recently contracted an infectious disease are most likely to spread disease, as new users are the ones most likely to impose the behavior in peers. As in the case of infectious diseases, education is provided; with infectious diseases, people are educated on how to live healthy and hygienic lifestyles. In the case of addiction, education is provided to divert people from engaging in these behaviors in the first place. Treatment is provided to both individuals with substance use disorders and infectious diseases (Goldstein, 1994).

Goldstein (1994) argued against the belief that people typically contract infectious diseases passively. He contended that people sometimes do not use preventative measures and engage in behaviors that lead to the contraction of a disease (e.g., being aware of a communicable diseases, not practicing safe sex, and thus contracting a communicable disease). Failure to use necessary precautions exacerbates infectious conditions, and some people contract the conditions by way of their behaviors or negligence of behaviors needed to prevent transmission; Goldstein (1994) related this to behaviors that lead to addiction.

Conclusion

Substance dependence has often been considered a moral failing or choice behavior. Research on substance dependence throughout modern history has shown increased knowledge of substance dependence as a disease both physical and psychological in nature. The conception of substance dependence as a disease appears to have begun in the 18th and early 19th centuries in the writings of Thomas Trotter, Benjamin Rush, and later T. D. Crothers.

Initially, the disease concept was not widely accepted. This was in part due to the Temperance Movement of the 1900s. Other reasons for this included vague and changing definitions of substance dependence and a lack of diversity of professionals focused on the studying the disease concept. Later, the concept became more popular during the 20th century because of the contributions of several organizations and researchers, including the World Health Organization, Alcoholics Anonymous, and E. M. Jellinek.

Substance dependence has evolved from a vague concept to an entire medical specialty. Several medical organizations such as the American Society of Addiction Medicine have been integral in this process. These advances have led to wider acceptance of the disease concept as well as improvements in treatment for individuals suffering from substance dependence.

Rather consistently, defining characteristics of the disease model include physical dependency characterized by increased tolerance and withdrawal symptoms, cravings, and continued use despite adverse consequences in various of areas of life. Physical dependence is also often referred to as a chronic and relapsing, or recurrent, condition. There has been a shift of the perception and treatment of substance use disorders

throughout history, which has implications not only for professionals but also for those who have substance dependency issues.

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APPENDIX A

Table 1.

Organizations that Contributed to Development of Disease Concept of Substance Dependence.

Organization Title	Year Established
American Association for the Study and Cure of Inebriety	1870
Alcoholics Anonymous	1939
National Committee for Education on Alcoholism	1944
National Council on Alcoholism (formerly National Committee for Education on Alcoholism)	1950
WHO Expert Committee on Habit-Forming Drugs	1949
WHO Expert Committee on Mental Health Sub-Committee on Alcoholism	1950
WHO Expert Committee on Drugs Liable to Produce Addiction	1950
New York City Medical Committee on Alcoholism	1951
WHO Expert Committee on Alcohol and Alcoholism	1953
WHO Committee on Alcohol and Alcoholism	1954
New York Medical Society on Alcoholism	1954
American Medical Society on Alcoholism (formerly the New York Medical Society on Alcoholism)	1967
WHO Expert Committee on Addiction-Producing Drugs	1964
WHO Expert Committee on Dependence-Producing Drugs	1966
WHO Expert Committee on Drug Dependence	1969
California Society for the Treatment of Alcoholism and Other Drug Dependencies	1972
Special Office of Drug Abuse Prevention	1972
National Institute of Alcoholism and Alcohol Abuse	1972
American Academy of Addictionology	1976
American Society on Alcoholism and Other Drug Dependencies (formerly the American Medical Society on Alcoholism)	1983
California Society of Addiction Medicine	1982
American Society of Addiction Medicine (formerly American Medical Society on Alcoholism)	1988-1989
National Council on Alcohol and Drug Dependence (formerly National Council on Alcoholism)	1990
American Board of Addiction Medicine	2007