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The concept of alcohol craving

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Summary

The aim of the article was to assess how the perception of alcohol craving, which is one of the symptoms of alcohol dependence, evolved, as well as how it was reflected in the diagnostic classifications. The purpose of this article was also a discussion of the models of the origins of craving, explaining the etiology of this phenomenon and the tools for measuring this concept. The concept of craving, defined as a strong need or compulsion to drink alcohol, functioned for many years, not only in the clinical practice but also as a concept inherently associated with alcohol dependence. However, among experts and researchers, there was no consensus about the etiology of this phenomenon and its development. Some emphasize the emotional – motivational aspect of it, while in the literature also its cognitive – behavioural nature is highlighted. Craving as a symptom has been recognized as a diagnostic criterion of alcohol dependence in the International Statistical Classification of Diseases and Related Health Problems – ICD-10. In the year 2013, it was also indicated as a symptom of disorder resulting from alcohol abuse in the Diagnostic and Statistical Manual of Mental Disorders – DSM-5. It seems to be significant also to discuss the tools used to measure craving, both in clinical trials and therapeutic practice, among them: the Alcohol Specific Role Play Test, Obsessive Compulsive Drinking Scale (OCDS) Lubeck Craving Scale (LCRR) and Alcohol Urge Questionnaire (AUQ).

Key words: alcohol addiction, alcohol craving, DSM-5, ICD-10

Introduction

The World Health Organization estimates that there are approximately 140 million people addicted to alcohol in the world [1], whereas in Poland, according to the State Agency for Prevention of Alcohol Related Problems, there are about 800 thousand

This study was not sponsored.

of them, accounting for 2% of the population. Another 5–7%, that is approximately 2–2.5 million people are hazardous drinkers who may join the group of addicts if they do not alter their drinking behaviour [2]. In the years 2001–2007, recorded intake of alcoholic beverages in Poland increased from approximately 6.5 to 9.3 liters per capita, which places our country in the top ten consumers of alcoholic beverages in Europe [3]. Given such statistics, it seems extremely important to track transformations in terms of diagnostic classifications adopted, as we observe changes in terms of the operationalization of the criteria for diagnostic classification of alcohol dependence. The most recent of these changes seems to be the inclusion of the symptom of alcohol craving in Diagnostic and Statistical Manual of Mental Disorders – DSM-5 [4]. This is of vital importance not only with respect to the scientific and substantive aspect but above all, to the practical one, improving the diagnostic process. It is worth noting that the concept of craving is highly relevant in the treatment of addictions and learning effective ways of dealing with it often becomes one of the major goals to be achieved by a patient at the primary stage of treatment.

It seems that despite the fact experts agree that craving is extremely important, when it comes to understanding alcohol dependence, there is no consensus as to the definition of the term. One of the first officially approved definitions of craving for alcohol was created in 1955 by the World Health Organization, discriminating between symbolic craving – related to loss of control and relapse into drinking, and non-symbolic craving – referring to the withdrawal syndrome [5]. Much controversy is also raised over the components of craving. Some authors emphasize that it is more of a phenomenon affecting the emotional and motivational sphere, defining it as a strong desire to drink [6]. A cognitive-behavioural nature of this phenomenon related to the intention of using alcohol and emphasizing its compulsive nature is also often referred to. The psychophysiological aspect is not to be underestimated, as an example of this may be the studies accounting for the galvanic skin response measured on encounter with the conditioned stimulus such as the smell of alcohol.

Alcohol craving as a criterion for alcohol dependence in selected diagnostic classifications

In accordance with the International Statistical Classification of Diseases and Related Health Problems (ICD-10) applicable in Poland (the publication of the subsequent edition of this Diagnostic Manual is expected in 2015), 6 symptoms of alcohol dependence are identified, and alcohol craving is defined as a strong need or compulsion to drink [7]. For a definitive diagnosis of alcohol dependence, three or more of the manifestations should have occurred together for at least 1 month or, if persisting for periods of less than 1 month, should have occurred repeatedly within a 12-month period [Table 1]. Should be noted, however, that the classification of ICD-10, having a rather clerical nature, serves to unify the terminology and scope of terms, and due to the imprecise of the clinical description, in the scientific research is a DSM classification is preferred [8].

The DSM-IV, like the previous editions of this classification, includes separate criteria for alcohol abuse and alcohol dependence [9]. Alcohol abuse could be diagnosed when at least one of the following four symptoms have occurred [Table 1]. Research has shown that there is a link between a diagnosis of dependence and such information from a clinical interview as the amount of alcohol consumed, cases of dependence in the family, previous therapies or suicide attempts. Such a correlation was not confirmed for the diagnosis of abuse [10].

However, much controversy has arisen over the proposed division in the DSM-IV. The researchers emphasize that the criteria for alcohol abuse have little in common with the diagnosis of a mental disorder, but more with impaired social functioning [11]. This opinion is only fortified by the fact that to identify alcohol abuse it suffices that a person meets only one of the four criteria, which increases the risk of a false positive diagnosis. It is worth mentioning that studies show that many people meet the criteria for dependence before they meet those of alcohol abuse. So, the diagnosis of alcohol abuse precedes the diagnosis of alcohol dependence in 66.8% of alcoholics [12].

In the scientific debate addressing the distinction between alcohol abuse and dependence, it has been argued that the subsequent classification should perhaps maintain the concept of alcohol dependence exclusively. Potential pejorative associations with a diagnosis of dependence are less devastating when compared to the number of patients who were not included in the treatment because they were classified in the group of abusers [13]. These considerations seem to be of particular interest when taking the cultural context into account and in this case, the considerable value attached to political correctness in the U.S. When compiling the new DSM-5 published in 2013 it was decided, however, that the term of substance use disorder be used [14]. In this classification disappeared (or remained residual) division into addiction to alcohol and alcohol abuse, which can be questioned.

The most significant modification in DSM-5 is related to the introduction of the craving criterion. Research shows that the inclusion of craving as a diagnostic criterion has increased the discriminative power by reference to an area which was not operable in the previous classifications [15]. The researchers postulate to take account of alcohol abuse disorder and other diagnostic methods, such as genetic testing or brain neuroimaging [16], which could be helpful in identifying a subtype of dependence, which in turn would undoubtedly enhance the accuracy and quality of the diagnostic process. The practice of the diagnostic process should not be left behind, however, and therefore the optimal criteria should be clear, concise and easy to remember by people using them while verifying them should not generate excessive costs.

Table 1. **Summary of diagnostic criteria for alcohol dependence and alcohol abuse in ICD-10, DSM-IV and DSM-5**

ICD-10 diagnostic criteria for alcohol dependence syndrome	DSM-IV diagnostic criteria for alcohol abuse	DSM-IV diagnostic criteria for alcohol dependence	DSM-5 diagnostic criteria
1. A strong desire or sense of compulsion to drink alcohol ("craving") 2. Impaired capacity to control drinking behaviour (impaired capacity to abstain from drinking, terminate it, or limit the levels of use). 3. A physiological withdrawal state when alcohol use is reduced or ceased (tremor, hypertension, nausea, vomiting, diarrhoea, insomnia, anxiety, delirium tremens at the final stage), or use of alcohol with the intention of relieving withdrawal symptoms; 4. Evidence of (usually increased) tolerance to the effects of alcohol, a need for significantly increased amounts of alcohol to achieve the desired effect. 5. Preoccupation with alcohol use at the expense of interests or role obligations. 6. Persistent alcohol use despite clear evidence of harmful consequences.	1. Recurrent use of alcohol resulting in a failure to fulfil major role obligations at work, school, or home. 2. Recurrent alcohol use in situations in which it is physically hazardous (e.g., driving an automobile or operating a machine). 3. Recurrent alcohol-related legal problems (e.g., arrests for alcohol-related disorderly conduct). 4. Continued alcohol use despite having persistent or recurrent social or interpersonal problems caused or exacerbated by the effects of the substance.	1. Need for markedly increased amounts of alcohol to achieve intoxication or desired effect; or markedly diminished effect with continued use of the same amount of alcohol. 2. The withdrawal syndrome for alcohol; or drinking (or using a closely related substance) to relieve or avoid withdrawal symptoms. 3. Drinking in larger amounts or over a longer period than intended. 4. Persistent desire or one or more unsuccessful efforts to cut down or control drinking. 5. Important social, occupational, or recreational activities given up or reduced because of drinking. 6. A great deal of time spent in activities necessary to obtain, to use, or to recover from the effects of drinking. 7. Continued drinking despite knowledge of having a persistent or recurrent physical or psychological problem that is likely to be caused or exacerbated by drinking.	1. Drinking in larger amounts, more often or over a longer period than intended. 2. Persistent desire or one or more unsuccessful efforts to cut down or control drinking. 3. A great deal of time spent in activities necessary to obtain, to use, or to recover from the effects of drinking. 4. Craving, or a strong desire or urge to use alcohol. 5. Recurrent use of alcohol resulting in a failure to fulfil major role obligations at work, school, or home. 6. Continued alcohol use despite having persistent or recurrent social or interpersonal problems caused or exacerbated by the effects of the substance. 7. Important social, occupational, or recreational activities given up or reduced because of drinking. 8. Recurrent alcohol use in situations in which it is physically hazardous. 9. Continued drinking despite knowledge of having a persistent or recurrent physical or psychological problem that is likely to be caused or exacerbated by drinking. 10. Need for markedly increased amounts of alcohol to achieve intoxication or desired effect; or markedly diminished effect with continued use of the same amount of alcohol. 11. The withdrawal syndrome for alcohol; or drinking (or using a closely related substance) to relieve or avoid withdrawal symptoms.

Models of alcohol craving incubation

As with the definition of craving, the researchers are not in agreement as to the etiology of this phenomenon. It seems that no single model explains all aspects of craving, but each contains elements that are likely to contribute to the creation of a comprehensive, holistic model. Some light on this issue could be shed by the division of craving incubation models based on conditioning mechanism and cognitive mechanisms proposed by Singleton and Gorelick [17].

The former models based on the assumptions of classic conditioning presume that alcohol-related stimuli (such as the sight of a bar or a beer bottle), become conditional stimuli as a result of associating them with alcohol consumption. They trigger the same psychological and physiological response as alcohol itself (such as the release of certain neurotransmitters in the brain) [18]. If the consumption of alcohol does not follow immediately, this results in craving. The models based on assumptions of classic conditioning should include: the model of conditional withdrawal, the incentive sensitization model, or the model of reactivity to stimuli [19]. Instinctively – conditional model based on learning theories explains the formation mechanism of addiction conditioning coming from the moderating influence of alcohol and the adverse impact of alcohol withdrawal, as well as the occurrence of craving. Thus, the behaviour aimed at avoiding withdrawal symptoms lead to seek alcohol for its positive effect, which leads to the development and maintenance of alcohol addiction.

The latter group of models of craving is based on assumptions related to the cognitive functioning of the individual. The processes taken into account include anticipation of positive effects of alcohol or individual beliefs about the capacity to cope with craving. The cognitive social learning theory is worth noting in this context [20]. Although Marlatt and Gordon focused primarily on explaining the process of relapse in alcohol dependence, the concept of craving is also important. It is defined as "the desire for a positive effect related to the use of alcohol." Thus, in high-risk situations, success in coping depends on the addict's confidence in his/her ability to resist the urge to drink [21]. This model recognizes craving only as one of several factors necessary to induce relapse. Therefore, four types of craving have been identified: craving in response to the withdrawal syndrome (desire to feel good again), craving in response to the lack of pleasure (to feel better), craving in response to the conditional stimulus and craving in response to the hedonistic pleasure. The models based on cognitive mechanisms also include e.g. a neurocognitive model (which assumes that the craving affects cognitive processes, as well as that it is moderated by them and when craving is experienced, areas of the brain responsible for memory and emotions are activated) and a model of cognitive processing.

Also noteworthy is a neuropsychoanalitical model of alcohol craving by Jaak Panksepp. Psychoanalysis treats addiction as a consequence of traumatic experiences in the early childhood and self-destructive consumption of alcohol as the realization of the desire of death. The craving of psychoactive substances, may be redefined in terms

of a number of emotional systems present in the mammalian brain. The use of opiates seems to endure separation anxiety and inhibit efforts to seek a guardian or substitute for, as demonstrated by studies in mice and monkeys [22]. The author points to of the connection between addiction and opiate dependency in a relationship, stressing that the intake of psychoactive substances may be a manifestation of self-healing, in which the acute mental pain is a result of an isolation from a loved one [22]. Panksepp also refers to a descriptions of the state of opiate deprivation, experienced by addicts that deceptively resembles those experienced by people in the states of infatuation, such as the loss of rationality or deficits in self-control. This model seems to be very promising as a starting point for further research on the link between affective processes and the development of craving, such as the impact of the 12 – steps program that accents aspect of spirituality on the activation of neural networks [23] .

Many of the works seem to indicate the existence of the genetic underpinnings of alcohol dependence, and hence the craving. The genes contained in chromosomes 1, 4, 7, 11 and 16 can be linked with greater susceptibility to the development of alcohol dependence [24]. Dopaminergic neurons in the ventral tagmental area are responsible for escalating the consumption of alcohol, which is linked to the DRD2 receptor polymorphisms.

It is worth mentioning the metabolic theory. Kostowski emphasizes that the development of alcohol dependence, in accordance with its objectives, would promote metabolic disorders, mainly the weakening of the function of liver enzymes involved in the metabolism of alcohol, which would lead to prolonged contact with alcohol receptors in the central nervous system [25].

Instruments used to measure craving

Until recently, the main tool for measuring craving were scaling questions, such as “have you felt a craving lately”, “how strong was your craving on a 1–10 scale.” This technique, due to the speed and clarity of its application, seems to be invaluable in clinical practice, however, it is difficult to apply it to research procedures. This is due to the fact that its accuracy and reliability is not ascertained. Based on this assumption, the researchers have developed tools for measuring craving that have been standardized [26], some of them have also been adapted to specific cultures [27]. It should be noted that the analog scales are the most commonly used in researches.

The following procedures and instruments designed to conceptualize and measure craving merit attention

One of them is The Alcohol Specific Role Play Test whose authors identified 10 categories of situations out of 600 potential ones reported by those addicted to alcohol which trigger craving. The subjects were asked to describe how they would react in a particular situation, while on completion of the task they assessed the level of

craving they felt in each of the scenes on an 11-point scale. The arbiters competently evaluated the effectiveness of assertive behaviours taken by the subjects [28]. Studies have shown that there is a correlation between high scores in the Specific Role Play Test and the number of relapse-related situations in patients over 6 months of the study [29].

The 14-item Obsessive Compulsive Drinking Scale (OCDS) developed based on existing questionnaires for the diagnosis of obsessive-compulsive disorder unrelated to alcohol use is yet another tool [30, 31]. It includes both the scale of craving, as well as subscales encompassing the component of obsession and compulsions related to drinking. This tool has also found its application in predicting the recurrence of drinking [32]. It is also worth noting that based on the OCDS an A-OCDS tool was developed to measure the level of craving in adolescents and young adults [33].

The Alcohol Urge Questionnaire (AUQ) consists of eight questions, four of which relate to the desire to drink, two relate to the hope, expectations of the positive effects of alcohol, while the final two pertain to the inability to refrain from using alcohol when it is available [29]. Respondents are asked to mark on a 7-point scale to what extent they agree with the given statements (where 1 means "strongly disagree" and 7 "strongly agree"). Studies have shown that there is a high negative correlation between the index of craving as measured by the AUQ and the length of time of abstinence [29].

Another tool, deployed among others studies such as GATE-1, is Lubeck Craving Scale (LCRR). It contains 10 questions, including those with multiple choice. Just as the other technique – the OCDS, this tool is also retrospective in its nature, however, the time perspective, to which it refers is longer. Patients are asked about the intensity of the desire to drink alcohol and the realization of this desire, in the last 30 days, the last year and the last three years [34].

Regarding the proposals for the operationalization and measurement of craving, the application of neuroimaging techniques or a 24-hour observation of the behaviour and monitoring physiological indicators also seem to be of interest.

Recapitulation

Many researchers regard craving as an important factor in the development and maintenance of alcohol dependence, but there is no consensus about its specific definition and creation of a single model. These ambiguities are reflected in consecutive created diagnostic classifications. The coexistence of multiple often contrasting theories may indicate that different subtypes of patients may present different mechanisms of craving. It seems to be promising to take into account in clinical researches typology of alcoholism, such as those created by Cloninger, Lesch and Zucker. Extending the reflection of genetic testing, may result in the creation of targeted treatment strategies, considering the clinical and pharmacological effects [35]. The issue that has not been included in this publication, but could not be forgotten, is an aspect of pharmacotherapy

of craving. According to the recommendations of the Pharmacotherapy Section of the Polish Society for Research on Addiction and the Section of Clinical Psychopharmacology of Polish Psychiatric Association, the first line treatment of alcohol craving is naltrexone. It inhibits activation of endogenous opioids after the administration of alcohol that results in the reduction of craving [36].

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