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Behavioural Approach to Alcohol Dependence: Towards a Multidimensional Model

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P S D V Prasadarao &, H Mishra .

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- *Department of Clinical Psychology, National Institute of Mental Health & Neuro Sciences, Bangalore 560 029, India*

Abstract

This article is an attempt to conceptualize alcohol dependence in a behavioural perspective. Behaviourally oriented models explaining alcohol dependence were discussed. A multidimensional model was formulated considering the predisposing factors (eg., personality), acquisitional factors (e.g., psychological cues) and maintaining factors (eg., alcohol related expectancies) concerning drinking and alcoholism. Accordingly, behavioural formulation was arrived at and a multidimensional therapeutic programme was discussed.

Key words -

Alcohol dependence,
Behavioural Intervention,
Multidimensional approach,
Behavioural formulation
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Alcohol dependence is a complex disorder involving physical, psychological and social aspects of the individual and having far reaching harmful effects on the family and society [1]. The social, familial and cultural contexts in which the problem drinking occurs are significant factors in determining which treatment approach can be most effective with an individual. To formulate the treatment approaches assessment of the sociocultural norms, attitudes and needs of the client are considered essential [2].

Research in the behavioural treatment of alcoholism has produced valuable information. Behavioural methods have been increasingly recognized as making significant contributions to the treatment of alcoholism and related problems [3]. Behavioural approach in understanding alcoholism and its intervention involves diverse conceptual models emphasizing the interaction between environmental factors and the individual's response. Behaviourally, alcoholism is viewed as a response maintained by its consequences, with cognitive, physiological, emotional, social and situational cues [4]. Models such as classical conditioning, operant conditioning, drive reduction, social learning and various others provide varying mechanisms to understand the nature of alcoholism. These models have provided alternative approach to the traditional

models in conceptualizing the etiology of alcoholism with emphasis on the acquisition and maintenance of problem drinking, leading to the development of appropriate intervention strategies. In general, the behavioural models assume that

(1) all patterns of alcohol use and abuse are learned;
(2) the antecedents of drinking behaviour can be objectively identified, assessed and intervened; and
(3) alcoholics can be helped through application of specific learning principles [5].

In the following section a few behaviourally oriented models explaining alcohol dependence are briefly reviewed.

Classical conditioning model

The classical conditioning model [6] postulates that contiguous pairing of a neutral stimulus with an unconditioned stimulus leads the conditioned stimulus to elicit an anticipatory (conditioned) response when presented alone. From the classical conditioning perspective, dependence or craving can be explained. Presence of exteroceptive (e.g., physical setting or drinking companions) or interoceptive (e.g., emotional states) cues associated with heavy drinking/withdrawal leads to craving, predisposing the individual to take alcohol; this further intensifies the craving and it leads to loss of control. According to this model, craving occurs due to

(1) the presence of conditioned stimuli that elicit the internal state; and
(2) the convergence of certain situational factors that determine how the internal state is labelled [7].

The classical conditioning model has been adapted in the treatment of alcoholism.

Aversive procedures developed based on this model are in use.

Operant conditioning model

The operant model explaining the acquisition, maintenance and modification of problem drinking, posits that the problem drinking is developed through selective reinforcement of incipient components of behaviour. When the behaviour is established by the intermittent occurrence of reinforcement it enhances the resiliency of the behaviour. The reinforcement seeking behaviour caused by the drug in the individual motivates him to learn compensatory responses to ameliorate this interference. Modification of drinking behaviour caused by the drug in the individual motivates him to learn compensatory responses to ameliorate this interference. Modification of drinking behaviour requires removal of positive reinforcers (i.e., extinction) and/or application of punishment. A variety of positive (e.g., money, social interaction) and negative (e.g., electric shock, social isolation) reinforcers have been in use within a number of operant paradigms (e.g., punishment, escape, token economy and contingency contracting) to modify drinking behaviour [5].

Social learning theory

According to Bandura [8] drinking behaviour is governed by principles of learning, cognition and reinforcement. The social learning theory suggests that drinking as a social behaviour, is acquired and

maintained by modelling, social reinforcement, the anticipated effects of alcohol and physical dependence. Parental norms and peer modelling of drinking behaviours also influence the development of internalized expectancies for alcohol effects [9]. The modelled behaviours get translated into expectancies which in turn determine the alcohol consumption. Certain individual factors (learned and/or inherited, biological and/or psychological) interacting with situational or environmental demands, may overwhelm an individual's ability to cope effectively and may lead to a decreased sense of efficacy [10]. The individual learns that alcohol can help to cope with the immediate situations, hence the probability of alcohol consumption increases. Socialization deficits may also predispose an individual to heavy drinking.

Expectancy theory

The importance of cognitive factors in the initiation and maintenance of drinking behaviours is central to expectancy model [11]. Individual's drinking is determined by his alcohol expectancies rather than by its mere pharmacological effects. Individual learns to expect short-term positive consequences of drinking as alcohol consumption leads to initial increase in the physiological arousal. Alcohol also tends to reduce the negative affect as it blocks the memory; alcohol reduces the past negative consequences and thereby reducing the outcome expectation of negative consequences of excessive consumption. Accordingly, drinking tends to transform negative feelings into positive feelings rather than reducing the negative affect. Hence, such positive expectations of an individual about alcohol and its consumption would interact with the degree of perceived stress and other coping responses to determine the extent of drinking [12]. Expectancy theory offers various directions for prevention and treatment. The individual's expectancies can be assessed systematically and attempts might be made to modify these expectancies accordingly [13].

Tension reduction hypothesis

According to tension reduction hypothesis [14] an increased internal tension in an individual leads him to a heightened drive state; alcohol consumption reduces this tension by lowering the drive-level due to its pharmacological properties; hence this drive reduction, acts as a reinforcer and in turn, strengthens alcohol consumption. This leads an individual to habitual drinking as alcohol consumption becomes a primary response to heightened internal tension [15]. This model does not adequately explain alcohol consumption as the tension reduction quality of alcohol is a single factor explanation but alcohol has various other characteristics along with reducing tension [11]. It is also considered incomplete as the cognitive component is not given importance in explaining the problem drinking its etiology and maintenance [5].

Motivational model of alcohol use

This model posits that such aspects as nonchemical incentives and affective changes due to alcohol

determine alcohol use, by contributing to the individual's motivation to drink, The individual decides to drink or not to drink based on whether the expected positive affective consequences of alcohol outweigh the expected ones due to nondrinking. Addiction occurs when factors that contribute to the decision to drink strongly outweigh factors that contribute to the decision not to drink. According to this model, individual's drinking depends on his decision to drink; historical factors (e.g., personality, sociocultural environment and physical reactivity to alcohol), his positive and negative incentives obtained from alcohol consumption, cognitive mediating events (thoughts, perceptions and memories), and physiological and instrumental expectancies of alcohol [16].

Biopsychosocial model

Mishra and Kumaraiah [17] proposed a model in which the biopsychosocial factors are given emphasis in the acquisition and intervention of substance abuse. According to this model acquisition can occur at three levels:

(1) Psychological
(2) Physiological and
(3) Social.

When acquisition occurs at a particular state of cue control (i.e., psychological, physical or social), then the intervention should start at that level first, and subsequently all other associated 'cues' be intervened adequately. According to this model, a broad spectrum approach for the management and prevention is needed to combine biopsychosocial and rehabilitative efforts in dealing with addiction. It also emphasizes on the cognitive and resocialization aspects with additional intervention for the associated problems of alcoholics.

The present paper is an attempt to conceptualize alcohol dependence, behaviourally, and to formulate a multidimensional treatment program dealing with various aspects concerning the acquisition and maintenance, specifically to suit the Indian clients.

Alcohol dependence; Behavioural analysis and formulation

The behavioural paradigm concerning alcohol dependence deals with the acquisition, mediational and maintaining factors of the problem behaviour, consequently, emphasis is given to these three factors while dealing with the problem behaviour in the therapeutic process. Accordingly, in the behavioural perspective, the problem drinking is conceived as a complex maladaptive behaviour pattern

(1) acquired through vicarious learning and drive reduction;
(2) mediated by heightened drive state, i.e., biopsychosocial in nature or consequent upon their interaction; and
(3) maintained by positive or negative affects/experiences engendered due to alcohol consumption [18].

Alcoholism is viewed as a condition in which the individual is predisposed due to certain characteristics (e.g., genetic vulnerability and personality). He acquires the habit of alcohol intake due to various physical, psychological and social reasons. He also maintains the drinking behaviour due to such reasons as attraction towards alcohol, alcohol related expectancies, alcohol related withdrawal

and inappropriate reinforcement strategies from within the environment.

In the following section, these predisposing factors, acquisition factors and factors that maintain alcohol intake are discussed.

I. Predisposing Factors

All individuals are not equally predisposed for developing alcoholism and alcohol related problems. Predisposition to alcoholism may be due to certain factors such as

(1) genetic vulnerability; and

(2) personality.1)

Genetic vulnerability

It is known that some individuals are more susceptible than others for alcohol problems due to certain genetic factors. Such aspects as ability to metabolize alcohol, central nervous system's sensitivity to alcohol and the capacity to adapt rapidly to the presence of alcohol are known to be genetically inherited. Some of these inherited predispositions are:

(a) enzyme variation and acquisition of alcoholism: some individuals have a deficiency of enzyme aceta [19].

(b) Neurotransmitter variations and alcoholism: it was hypothesized that alcoholism could be due to ger [19].

(c) reinforcing effects of alcohol: Individual's genetic predisposition to alcoholism could be due to inhe [19].2)

Personality

Research on personality characteristics and susceptibility to alcoholism suggests that individuals with specific personality characteristics are more prone to develop problem drinking. Various longitudinal studies have provided valuable information about the personality precursors of alcohol problems. Across studies, certain personality characteristics have been consistently found among adolescents who later developed problems with alcohol. These characteristics include independence, aggressiveness, nonconformity and rejection of societal values, antisocial behaviour, impulsivity and hyperactivity. Adolescents who developed problems with alcohol were also found to be less interested in working to achieve long range, enduring goals that are generally valued in the society. They find sources of positive reinforcement in immediately available, short-term incentives that they act impulsively to acquire [20]. 'Prealcoholics' were found to be significantly higher on the F, Pd and Ma scales on the MMPI [21].

II. Acquisition of problem drinking

The individual may acquire drinking behaviour through various ways. These may include peer group pressure, curiosity, fun, avoidance of negative emotional states and certain physical states [17], [18]. The alcohol related antecedents were classified into internal e.g. (anxiety) vs external (e.g. work problems) and acute (e.g., seeing an alcohol bottle) vs. chronic (e. g., depression) [22].

Alcohol intake is viewed as a learned behaviour acquired in a vicarious fashion due to certain antecedent cues. These antecedent cues can be classified as

(1) physical;

(2) psychological; and

(3) social.

Often one or more antecedent cues may influence the drinking behaviour, in combination within an individual [17], [18].
(1)

Physical cues:

Many a time, alcohol consumption temporarily helps an individual in alleviating certain physical states such as fatigues after a day's work, physical exhaustion and bodily aches and pains. These physical antecedents may force the individual to continue drinking regularly [17].
2)

Psychological cues:

Certain psychological cues play a significant role in the acquisition of drinking behaviour. These may include nonassertiveness, lack of socials skills, psychological states such as anxiety, depression, feelings of inferiority, boredom and inadequacy. Other aspects such as temporary relief from psychosocial stressors may also influence the alcohol consumption. When the individual consumes alcohol he may feel subjectively well with decreased inhibition. He may also feel more assertive due to the short-term positive effects of alcohol. Consequently, the individual learns that alcohol helps him and hence would attempt to drink regularly [17].
3)

Social cues:

various social cues play a major role in the acquisition of drinking behaviour. These may include peer group pressure, approval from friends, enhanced social interaction, reduced inhibition in the social situations and modelling the significant others. Other social cues include familial, marital, occupational and financial stressors. Alcohol is also consumed during religious rites or as a family custom. In some cultures consumption of alcohol is regarded as a 'Status symbol' and also due to sense of 'belongingness' [17].

III. Maintaining factors

Individual learns vicariously that alcohol consumption would help in various physical, psychological and social states and he starts drinking. Subsequently, consumption may increase in quantity and frequency, due to the development of tolerance. Daily consumption is also maintained by such factors as
(1) attraction towards alcohol;
(2) alcohol related expectancies; and
(3) alcohol related withdrawal.(1)

Attraction towards alcohol:

As the individual drinks regularly, he may develop attraction towards alcohol. Consequently, when the individual comes across the alcohol related stimuli (e.g., alcohol glasses, alcohol bottle, bar and wine shop) either overtly or covertly, he tends to develop attraction because of which the drinking behaviour is maintained and hence the problem of drinking starts.
(2)

Alcohol related expectancies:

It has been described that alcohol related expectancies play a major role in the maintenance of drinking behaviour. The individual expects that alcohol would help in developing positive behvaioural effects

(e.g., feeling assertive and better occupational and sexual performance) and in reducing negative affect (e.g., alleviating anxiety and depression). Hence he continues drinking to maintain these expected effects of alcohol intake [13].
(3)

Alcohol related withdrawal:

As the individual continues drinking regularly, he may develop dependence; consequently during the abstinence periods, he develops both physical and psychological withdrawal symptoms. In order to avoid distressing withdrawal symptoms he continues drinking. this becomes a vicious cycle and the individual continues drinking to avoid withdrawal and drinks more and more due to tolerance.
(4)

Inadequate reinforcement from significant others:

Often the significant others (eg., alcoholic individual's family members) develop a behaviour such that the reinforcement patterns are inadequate. They do not reinforce the alcoholic's positive behaviour. Moreover, they always tend to use improper reinforcement patterns in dealing with an alcoholic individual. This may also act as a maintaining factor for problem drinking.

Thus, the behavioural diagnosis of alcohol dependence can be viewed as
(1) a conditioned maladaptive pattern which is drive reducing;
(2) a conditioned response pattern which is anticipatory in nature and cue-controlled response;
(3) a conditioned vicarious response; and
(4) an instrumental operant response maintained by biopsychosocial consequences.

These behavioural formulations are the pointers towards differential therapeutic programming with manifest individualistic pattern of behaviour. Alcohol dependence is a form of competing response as a substitute for absence of reinforcement or its inadequacy in the social dimensions.

Alcohol dependence: towards multidimensional therapeutic programming

From behavioural point of view, the treatment program concentrates on the antecedent cues and maintaining factors in order to deal with alcoholism successfully and to have a stable outcome. As alcoholism is viewed as a condition with various physical, psychological and social factors influencing it, the treatment program should also contain various therapeutic procedures dealing with all these three aspects effectively [23]. Hence a multidimensional treatment is advocated in the intervention. Due to the heterogeneity and complexity of problem of alcoholism, dealing with a single dimension could be ineffective and/or inadequate. Research indicates that when two or more treatment modalities are used in combination, the effectiveness of treatment improves significantly. Hence multimodal therapeutic procedures need to be used in a logical and consistent fashion considering antecedents, nature of acquisition and maintaining factors.

This approach provides the individual with alcohol dependence with the means of achieving reinforcement from sources other than alcohol consumption. It also involves identifying both the discriminative stimuli for drinking and the reinforcing consequences, and making the occurrence of other more satisfying behaviours through various therapeutic methods [24].

Behavioural procedures frequently used in the broad spectrum treatment programs include aversion

therapies, cover sensitization, relaxation training, self-control training, cognitive restructuring, social skills and assertiveness training and contingency management [3], [25], [26]. Based on the multidimensional model, a broad spectrum therapeutic program with suitable components of therapy needs to be formulated [27], [28], [29].

1)**Physical:**

In order to reduce the attraction towards alcohol, aversion therapy which reduces the attraction towards physical cues of alcohol and alcohol related stimuli is essential. Thus, aversive conditioning is used with electric shock as a noxious stimulus associated with alcohol related visual and olfactory stimuli.

2)**Psychological:**

Providing adequate knowledge about various aspects concerning alcohol and alcoholism would bring about a change in the individual and make him ready for treatment. Hence imparting such information through alcohol education program is essential in a multidimensional treatment program. Moreover, the individual also needs to be taught self-control methods in order to reduce his attraction towards drinks. Hence a therapeutic procedure which creates aversion at the cognitive level. i.e., covert sensitization, is useful in order to reduce the attraction towards drinks in the natural environment. This would help the individual by inducing a cognitive cue control for dealing with his own urges towards alcohol effectively.

3)**Social:**

As drinking behaviour has its social antecedents it is also essential to deal with these aspects in order to control the problem effectively in a comprehensive manner. Various techniques have been suggested to deal with the social aspect; these include social skills training, assertiveness training and communication skills training. As described in the literature, the problem drinking behaviour may also be maintained due to the inadequate and/or improper reinforcement patterns in the immediate environment. Hence it is essential to modify these reinforcement patterns to provide adequate positive reinforcement contingent upon the individual's sober behaviour. Hence behavioural counselling to the significant others is also essential.

As indicated in various theoretical models, alcohol dependence is a form of cognitively controlled habit pattern wherein, appraisal and attraction are in the form of self inadequacy, satisfaction from drive reduction, satisfying peer group and misconceptions/expectancies and in achieving self-assertion. Hence therapeutic programming would remain incomplete and would not achieve psychoprophylactic value unless cognitive behaviour therapeutic procedures are interwoven into the treatment programs which are individually tailored to an index person. The cognitive behaviour therapies have an edge over the directly conditioning methods as they form the bond between breaking of a 'habit' and prevention of relapse.

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