POSTNOTE

Number 356 May 2010

Addictive Behaviours

Behaviours such as gambling and over-eating can become compulsive and are linked to personal and social problems. This note reviews research on the addictive dimensions of gambling, eating, sex, internet use and shopping. It provides an overview of factors contributing to addictive behaviours and the personal and social consequences. It also examines the implications for treatment provision, public health and prevention strategies and industry regulation.

Overview

- Many experts consider excessive and compulsive behaviours as analogous to other addictions such as alcohol and drug use.
- Addictive behaviours place burdens on individual, families and communities, and are linked to social problems such as obesity, debt and crime.
- Treatment provision for behavioural addictions varies considerably throughout the UK, with metropolitan areas much better served than rural ones.
- The prevalence and burden of addictive behaviours may be reduced by the use of anti-addiction medicines, improved public awareness and increased regulation of industries and products.
- Cross-departmental involvement in a strategy focusing on both drug and behavioural addictions could help mitigate a wide range of social problems.

Background

Some individuals experience a loss of control over behaviours such as gambling, eating, sexual activity, shopping, internet use and stealing. Recent discussions, including those in the government's 2005 Foresight report on Brain Science, Addiction and Drugs have focussed on whether non-drug behaviours should be viewed as disorders that are essentially similar to drug addictions. At present the most widely used psychiatric diagnostic manuals[1,2] place such behaviours in a range of broad categories such as impulse control, anxiety, sexual and eating disorders. However, many researchers and clinicians propose that future diagnostic manuals should recognise behavioural addictive disorders in their own right, for example by grouping them with addictive disorders like alcoholism and drug abuse.

Similarities between Drug and Non-drug Addictions

Drug- and non-drug addictions co-occur in many patients, and addiction counsellors observe that patients who give up alcohol or drugs may transfer their addictive behavioural patterns to activities such as gambling or eating. There are also striking similarities in the physical and psychological symptoms associated with drug dependence and addictive behaviours. Many individuals exhibiting addictive behaviours satisfy the clinical criteria developed to diagnose drug addiction (Box 1).

Box 1. Signs and Symptoms of Addiction

Substance addictions are diagnosed when drug use leads to clinically significant impairment or distress, and where three or more of the following symptoms occur within a year.

Tolerance: the effects of the same amount of a drug diminish over time.

Withdrawal: psychological and physiological symptoms that occur when the drug use/behaviour is discontinued.

Escalating use: greater than intended use of drug or display of behaviour. For example, the drug is taken in larger amounts or for longer periods than intended.

Continued drug use despite harmful consequences.

Desires and/or unsuccessful efforts to cut down on substance use or behaviour.

Significant time and effort spent on obtaining and using substance or recovering from the drug's effects.

Important social or occupational activities given up or reduced because of substance use.

Box 2. The Biology of Addictive Behaviour

Advances in neuroscience indicate that the distinction between drug and non-drug addictions is not clear-cut. Addictive drugs (such as cocaine, heroin and alcohol) activate 'pleasure centres' in the brain associated with euphoria and positive feelings. This mechanism evolved to reward behaviour essential to survival and reproduction. Substance use shifts from casual to addictive behaviour as drugs act on these parts of the brain and over-stimulate them to the point that other, non-drug behaviours pale in comparison. Scientists have found that some intensely-experienced behaviours also over-stimulate pleasure centres. Their activation results in the release of chemicals whose structures and effects are very similar to those of heroin and cocaine. The most important of these substances – sometimes referred to as the brain's own drugs – are dopamine and endorphins.[3]

Brain imaging studies have found evidence of similarities between patients addicted to cocaine or alcohol, and those experiencing behavioural compulsions. For example, when a compulsive overeater is shown images of palatable foods, the brain's pleasure centres are activated in a way that differs from 'normal', non-addicted eaters, but is similar to drug addicts. While taking illicit drugs can stimulate the brain to a greater degree than engaging in non-drug behaviours, the basic biological processes are the same. Gambling addiction - for which a large research literature is available - is studied by scientists who wish to examine the fundamental mechanisms of addiction without the confounding effects caused by illicit drugs.

For example, as a result of experiencing compulsive sexual behaviour an individual might spend a great deal of time seeking and engaging in sexual activities, avoid social activities in order to do so, and experience health problems such as sexually-transmitted infections.

Some addiction researchers argue that non-drug behaviours should be viewed as similar to drug addiction because the same biological pathways are involved in both drug and non-drug behaviours (Box 2). They suggest that there is a range of objects and activities that can be both pleasurable and risky for humans such as drugs, food and sex. Some individuals are liable to develop such strong attachments to these that their ability to moderate their behaviour is significantly diminished. This note focuses on evidence supporting the view that behavioural addictions are legitimate medical conditions, though at present there is a lack of scientific consensus on the matter.

Scale of the Problem

Prevalence of Excessive Behaviours

There are no reliable data on the overall prevalence and costs because the notion of addictive behaviours remains controversial and hence little studied. While there is some data on overeating and problem gambling, very little research exists on the prevalence and costs of other addictive behaviours, such as compulsive shopping or internet use.

Overeating and Obesity

Obesity causes significant chronic health problems, including heart disease, diabetes and lowered life expectancy. It costs the NHS an estimated £0.5 billion a year and the wider economy in excess of £2 billion per year. The government's 2007 Foresight report, Tackling Obesities, notes that the majority of adults in the UK are already overweight, and that by 2050 60% of men and 50% of women could be clinically obese. While the causes of obesity are complex, evidence suggests that some cases are linked to addictive eating. Moreover, foods high in fat and/or refined sugar have been found to be particularly pleasurable, and are associated with high levels of food craving in some individuals.

Gambling, Debt and Financial Problems

Addictive behaviours (notably gambling and shopping) are associated with financial problems and debt, as individuals overspend on pleasurable activities or products. Gambling addiction often leads to negative personal, family, financial and employment consequences. In addition to its links with debt and bankruptcy, divorce, lost productivity and crime (such as theft and fraud), it is also linked to mental health problems such as depression and anxiety. Surveys published in 2000 and 2007 estimate that between 0.6% and 0.8% of the adult population in Great Britain are problem gamblers. The charity GamCare estimates the social and economic costs of problem gambling at £2 billion per annum. The NHS estimates that around 50% of gambling addicts are also addicted to alcohol, and depression and attempted suicide among gambling addicts is at least double the national average. Some experts feel that because many gambling problems are dealt with as health issues, the Department of Health should have some responsibility for gambling policy.

Contributing Factors

The underlying causes of addictive behaviours are many and complex. Most of the available evidence comes from studies of gambling, which provide evidence implicating a range of personal factors including genetics and personality traits (Box 3). Such traits are likely to be common to many different addictive behaviours. For example, impulsivity and novelty-seeking traits have been linked to some criminal offending behaviours such as theft and to compulsive sexual behaviours. There is also evidence that some social groups are more vulnerable to problem gambling than others. Disadvantaged groups experiencing poverty, unemployment and low levels of education are most likely to suffer gambling problems. Among these groups, single men are the most at risk. Studies suggest that the earlier a child or adolescent starts to gamble, the greater the risk of problems relating to gambling in later years; and the prevalence of gambling problems is often several times higher among adolescents than among adults.[4]

Technological and regulatory changes may also contribute to problems. Some gambling and addiction researchers believe that the 2005 Gambling Act favoured expansion of the gambling industry without due consideration to possible negative consequences. The internet provides broad and easy access to many kinds of gambling, and also facilitates a range of other potentially addictive behaviours such as online shopping, videogame playing, and pornography viewing.[5] Experts in the US have also observed that the dramatic rise of internet stock trading that has occurred

since online brokerage firms emerged in the late 1990s has led to a rising incidence of addictive problems relating to online trading.

Treatment Strategies

Treatment Programmes

Treatments for compulsive behaviours are often modelled on approaches developed for drug and alcohol addiction. For example, the 12-step addiction recovery model established by Alcoholics Anonymous has been adapted by organisations dealing with a range of behavioural problems:

- Gamblers Anonymous;
- Overeaters Anonymous;
- Debtors Anonymous;
- Sex & Love Addicts Anonymous;
- Offenders Anonymous.

Cognitive Behavioural Therapy

Efficacy of different interventions is poorly defined due to a lack of systematic research evaluating treatment outcomes. However, Cognitive Behavioural Therapy (CBT), a psychological therapy designed to change patterns of thought and behaviour, is endorsed by psychologists and the NHS as an effective clinical approach. Because anxiety, depression and other mental health conditions often co-exist with behavioural addictions, CBT is often used in conjunction with other strategies such as support groups and medicines.

Access to Treatment

NHS treatment availability for compulsive behaviours is uneven throughout the UK, with access varying significantly for different kinds of behaviours and across different geographic areas. Treatment for compulsive eating can be accessed relatively easily throughout much of the UK via GPs and/or eating disorder clinics. In contrast, while several cities have established some treatment and referral pathways for problem gambling (for example, a National Problem Gambling Clinic was recently established in London), treatment provision is patchy outside of major urban areas. A 2008 review of research, education and treatment by the Gambling Commission suggests that less than 1% of those who could benefit from treatment receive it. Treatment provision for problems such as compulsive sexual behaviour and excessive internet use is even more minimal within the NHS. However, private addiction clinics and other treatment providers offer programmes for a range of behavioural addictions, and a number of non-profit organisations, such as GamCare and 12-step organisations, provide free services.

Medicines

There is growing interest in 'anti-addiction' medicines, although these are unlikely to provide a complete solution to problems associated with addictive behaviours. Some are being developed specifically for behavioural compulsions, but many were originally developed for drug addiction. A number of biological processes implicated in addiction have been identified as possible targets for new medicines (Box 4). Medicines are also being investigated as a means of reducing the urges associated with compulsive sexual offending behaviour, as a way of reducing recidivism.

Box 3. Case Study: Gambling Addiction

Current Policy

The Department for Culture, Media and Sport (DCMS) is responsible for gambling policy and legislation. The 2005 Gambling Act introduced a new licensing regime on gambling operators to encourage innovation and expansion of the industry, to respond to technological changes, to keep gambling open, fair and crime-free and to protect vulnerable people from harm. Among the key revisions was limiting restrictions on setting up new casinos, gambling advertising and the introduction of new regulations for online gambling sites. Though industry de-regulation was based in part on perceptions of general public approval of gambling, recent research indicates that the public considers gambling to be more harmful than beneficial for society, and should not be encouraged.[4] The Act established the Gambling Commission, an independent non-departmental public body sponsored by the DCMS, to regulate commercial gambling in the UK.

Risk Factors for Gambling Problems

Biological, psychological and social factors are associated with the incidence of gambling addiction. The 2007 British Gambling Prevalence Survey indicated that children of problem gamblers have an increased risk of becoming problem gamblers themselves. Family and twin studies suggest a link to genetics, and research suggests abnormalities in genes associated with serotonin and dopamine systems in the brain's reward system may be implicated. Psychological studies suggest that some personality traits – particularly impulsivity and novelty-seeking – play a predisposing role.

The availability of gambling opportunities is a key social factor that contributes to the variation of rates of gambling problems in different regions. Widely-available electronic gaming machines are associated with the highest rates of problem gambling worldwide; in contrast, casinos that require deliberate planning and travel efforts tend to discourage repetitive and impulsive conduct. Anecdotal evidence suggests that some forms of gambling are more addictive than others. Clinicians report very little addictive behaviour arises through participation in the National Lottery. Problems are more likely to emerge from betting on horse and dog races, table games in casinos and gambling-machine playing. Generally, forms of gambling considered most addictive are those that allow for continuous play and which offer quick and frequent payouts.[5] Current regulations allow children to gamble on fruit machines, making the UK one of the few jurisdictions in the world to permit this.[6]

Reducing Addictive Behaviours

Critics suggest that government approaches to understanding and managing social problems resulting from addictive behaviours could make greater use of scientific evidence. For example, the Department of Health's 2008 'Healthy Weight, Healthy Lives' report did not consider whether addictive eating contributes to the UK's high rates of obesity. This may result from the tendency to view individual social problems (for example, debt, obesity and gambling) as completely separate issues, rather than as problems that may have common features. Some have suggested that it might be useful to establish a policy framework for reducing addictive behaviours that would cut across problems such as drug abuse, obesity, gambling, smoking and binge-drinking.[7]

Awareness and Prevention

There is limited public understanding of the risks that excessive non-drug behaviours pose, and of the treatment services available. Moreover, individuals suffering from addictive behaviours such as overeating and problem gambling face stigma, partly due to a moral presumption that all behaviours are or should be completely under voluntary control. The provision of public health information, targeted towards at-risk groups, can help to alleviate stigma and to reduce the prevalence of addictive behaviours. Awareness could also be increased among GPs and other healthcare professionals. At present there is no training for GPs to identify and refer individuals with behavioural addictions to available treatment providers.

It is difficult to measure directly the impacts of education and prevention campaigns on individual behaviours, but there is some evidence of the ability of media campaigns to reduce prevalence.[8] For example, a controlled trial of a TV-based anti-smoking campaign in England reduced smoking prevalence by about 1.2% over 18 months. However, as noted in a 2010 government-commissioned review of health inequalities, prevention efforts are a low priority in the NHS, with only 4% of total NHS funding spent on them.

Industry and Product Regulation

One effective way to reduce the prevalence of addictive problems is to control individuals' exposure to risky products and environments. A key strategy for doing this could be to raise the costs of engaging in certain behaviours. Some commentators suggest that one way of raising costs is by taxation - for example, by imposing tax on junk foods that may encourage unhealthy and excessive eating. While such a tax could produce modest but meaningful changes in food consumption, it would disproportionately impact those with lower incomes.

Another strategy would be to impose direct price controls, which establish minimum pricing regimes for such products. Price control policies have been endorsed by alcohol researchers and the House of Commons Health Select Committee, but are opposed by industries and supermarkets. A related but more moderate approach is to regulate the kinds of products offered by industries, and the information that industries provide about their products. In relation to food products, the Department of Health is encouraging food manufacturers to reduce fat and salt content in some products, and to include better nutritional labelling.

Industry-funded Initiatives

Many addictive behaviours are linked to the activities and interests of 'consumptive industries' that profit from the provision of services and products that may be consumed to excess. Some suggest that these industries should be held more responsible for funding independent research, treatment and prevention initiatives. This principle has been adopted to an extent in relation to problem gambling. Since publication of a report by the Gambling Review Body in 2001, the industry has been contributing funds on a voluntary basis to an independent charity that in turn funds research and treatment efforts. However, the £3.6m provided in 2007 amounted to about £17 per problem gambler, a figure considered insufficient by the British Medical Association, which has called on industry to increase its contributions to at least £10m.

In 2009, as a response to government pressure, the gambling industry provided voluntary contributions (£5m in 2009/10) to sponsor additional research and treatment costs. In addition to providing funding, industries can also provide services to help individuals control their own behaviour. For example, the Institute for Government has suggested that casinos could make existing 'self-exclusion' programmes more accessible. These allow gamblers to voluntarily ban themselves from casinos, which venues enforce.

Box 4. Targets for Anti-Addiction Medicines

Pleasure Systems
Studies show that medicines that make the brain's pleasure centres less susceptible to the effects of addictive drugs may be useful as adjuncts to psychological therapies for behavioural addictions. For example, naltrexone, used to treat heroin and alcohol addiction,[2] may be useful in the management of overeating, compulsive sexual behavior, and compulsive shopping and stealing. Some medicines in this class cause serious side effects that prevent their widespread use. However, there is hope that more targeted drugs with fewer side effects will be developed.

Decision-Making Processes
Brain imaging and neuroscience studies indicate that addiction is linked to impaired cognitive functioning in many individuals. Such deficits have a negative impact on treatment outcomes, as they render addicts less able to make balanced choices about their behaviour, and less likely to benefit from cognitive and behavioural therapies. Medicines that improve cognitive functioning, such as donepezil, modafinil and ampakines are under investigation as addiction treatments. It is hope that these will improve the success rates of concurrent psychological treatments.

Memory
Addictive behavior is partly driven by memories of powerful experiences, as individuals remember intensely pleasurable experiences and seek to re-live them. Because of this connection, researchers are investigating medicines that block the formation and consolidation of memories as potential addiction treatments. For example, animal studies suggest that compounds affecting brain proteins involved in storing long-term memories may provide therapeutic benefit. Potential medicines include memantine and d-cycloserine.

Endnotes

1 American Psychiatric Association, *DSM-IV: Diagnostic and Statistical Manual of Mental Disorders*, 1994
2 www.who.int/classifications/icd/en/
3 POSTnote 334, *Treatments for Heroin and Cocaine Dependency*, June 2009
4 Gambling Commission, *British Gambling Prevalence Survey*, 2007
5 Orford, J., *Problem Gambling and Other Behavioural Addictions*, Foresight Report, Brain Science, Addiction and Drugs, 2003
6 www.gamblingcommission.gov.uk
7 Giddens A., *All Addictions Turn from Pleasure to Dependency*, The Guardian, October 16 2007
8 POSTnote 283, *Health Behaviour*, May 2007

POST is an office of both Houses of Parliament, charged with providing independent and balanced analysis of policy issues that have a basis in science and technology. POST is grateful to Dr Scott Vrecko for researching this briefing, to the Wellcome Trust for funding his parliamentary fellowship, and to all contributors and reviewers. For further information on this subject, please contact the co-author, Dr Sarah Bunn.