The classification and organization of alcohol misuse prevention with a focus on environmental prevention

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Oxford Brookes University has received funding from the alcohol industry for unrelated education and training work

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Abstract

Purpose of review:

Classifying prevention as universal, selective or indicated only considers the form of interventions. This is limited as it fails to explain the function, or purpose, of interventions. This paper discusses a taxonomy for alcohol misuse prevention that considers both the form and function of prevention interventions. It adds to the previous literature by incorporating subcategories of classification for environmental prevention.

Recent findings:

Within each taxonomy category there are interventions which are more, and less effective, but not one single category has comprehensive evidence of efficacy. Environmental prevention may have the greatest potential to deliver interventions that are efficient, cost effective and reduce health inequalities. However, comprehensive, systems oriented, prevention coverage should combine all three functional approaches.

Summary:

This taxonomy can be used to organise and classify alcohol misuse prevention interventions and to determine where alcohol misuse prevention strategies and research is warranted. Furthermore, it can help practitioners and researchers to consider the subcategories of environmental prevention: an area that is rapidly gaining traction in the prevention field.

Introduction

Following the report of the Commission on Chronic Illness in 1957 a prevention classification system incorporating the categories of primary and secondary prevention was established. Primary prevention was defined as "…practiced prior to the biologic origin of disease…" and secondary prevention as "…practiced after the disease can be recognised, but before it has caused suffering and disability…" (1). This classification system was left unchallenged until 1983, when Special Assistant to the Director at the United States National Institutes for Health, Robert Gordon, queried its relevance to multifactorial chronic diseases, which constitute a major cause of mortality and morbidity (2). Gordon recognised that the categories of primary and secondary prevention, whilst relevant to communicable diseases, were not so easily applied to non-communicable diseases with complex aetiologies and no clear biological origin, for example mortality and morbidity associated with alcohol misuse. Gordon therefore proposed an alternative system that went beyond diseases with a distinct biological origin, to those which manifest as a result of a complex fusion of behavioural and social factors. Gordon described universal, selective and indicated prevention categories, representing the target population group(s) for whom the intervention is deemed most optimal:

Universal prevention: a measure that is provided for everyone in a given population regardless of individual risk.

Selective prevention: a measure that is provided for sub-groups that are at increased risk.

Indicated prevention: a measure that is provided for high-risk individuals who have minimal but detectable signs, symptoms or markers foreshadowing a disorder.

Gordon's classification system has been increasingly influential. In 1994 the United States Institute of Medicine (IoM) adopted a prevention classification system that was based on Gordon's typology for application in the mental health field (3). Later on, in 2009, the IoM undertook a review for a report on how to prevent mental, emotional and behavioural disorders in young people, which assessed the historical groupings of primary and secondary prevention; the classification system (universal, selective and indicated) that was in usage; and emerging developments. This review concluded that the system comprising universal, selective and indicated prevention remained the most appropriate for classifying preventive interventions prior to the onset of a condition (4).

Although this classification system is increasingly used, there are some limitations, and so an enhanced classification system was proposed in 2013 (5••). The universal, selective and indicated dimension only covers the form that a prevention intervention would take, that is the population group it would be delivered to. An important limitation of this form based system is that it does not incorporate or clarify the purpose, or function, of a prevention intervention. For example, environmental prevention approaches aim to reduce the opportunity for maladaptive behaviours and evoke more healthful behaviours by altering the regulatory, economic and/or physical environment (6•). They include laws, regulations, taxation, and alterations to products and their placement in the physical environment. A key aspect of environmental prevention interventions is that they do not require a high input from personal resources such as conscious decision making, motivation and intent to prove beneficial (6•). Recently there has been a shift in attention toward prevention interventions that work via non-conscious processes (6•), and therefore this paper specifically focuses on environmental prevention. However, alongside environmental prevention there are also other,

functional, prevention types that we should still consider, namely skills development and information provision:

Environmental: prevention interventions that aim to limit the opportunity for maladaptive behaviours by altering the context of behaviour within the regulatory, economic and/or physical environment.

Skills development: prevention interventions that aim to promote adaptive behaviours and limit maladaptive behaviours through the socialization and development of individual skills so that individuals have greater personal competencies.

Information provision: prevention interventions that aim to increase knowledge and awareness by altering the focus of attention toward the positive aspects of adaptive behaviours and/or the negative aspects of maladaptive behaviours, in order to make certain behaviours more, or less, appealing.

Both the form and function of prevention are important and useful dimensions for classification. When put together, the form and function dimensions provide a prevention matrix that can be used not only for classification but also, importantly, for planning and organising comprehensive prevention strategies. Table 1 gives an illustrative example of alcohol misuse prevention interventions when considering both the form and function of prevention.

Table 1: Prevention form and function matrix: illustrative example of interventions for alcohol misuse prevention

	Universal	*Selective*	*Indicated*
Environmental	Drink driving legislation; minimum unit pricing; serving alcohol in smaller glasses in licensed premises	Prohibition of alcohol purchasing by minors; reducing alcohol retail outlet density in high-risk neighbourhoods	Restrictions on individuals accessing licensed premises through Pubwatch or Best Bar None schemes
Skills development	School wide social/life skills curriculum or strengthening families programmes	Social competency development programme for youths with a family history of alcohol misuse	Individual counselling and motivational skills sessions with heavy drinking adults
Information provision	Mass media campaign to raise awareness of recommended limits for alcohol intake; NHS Choices website page with information about "Drinking and alcohol"	Informational campaign targeted at pregnant women in deprived areas; Drinks Tracker mobile 'app' to monitor drinking and give tailored advice to reduce alcohol consumption	Social norms personalised feedback for college students who have screened positive for risky drinking

Environmental prevention interventions can be further categorised according to the aspect of the environment that they modify, namely regulatory, economic or physical. Table 2 gives an illustrative example of how the matrix can be expanded to incorporate these sub-categories.

Table 2: Prevention form and function matrix for subcategories of environmental prevention: illustrative example of interventions for alcohol misuse prevention

	Universal	*Selective*	*Indicated*
Environmental Regulatory	Drink driving legislation, restrictions on alcohol advertising	Prohibition of alcohol purchasing by minors, prohibition to sell alcohol within high-risk sporting venues	Restrictions on individuals accessing licensed premises through Pubwatch or Best Bar None schemes
Environmental Economic	Taxation, minimum unit pricing	Offering free or reduced price soft drinks to designated drivers in licensed premises	Offering free drinking water to intoxicated individuals in licensed premises
Environmental Physical	Serving alcohol in smaller glasses in licensed premises, placing lower strength alcoholic products at eye level within supermarkets	Serving alcohol in polycarbonate/plastic vessels in venues in high-risk areas, reducing the volume of background music played within high-risk venues, reducing alcohol retail outlet density in high-risk neighbourhoods	Providing local "booze buses" and sobering-up centres for intoxicated individuals

In practice environmental prevention interventions may straddle more than one subcategory and prevention strategies and initiatives may combine informational, developmental and/or environmental interventions to create a particular ethos or culture. For example, government alcohol strategies, healthy workplaces, safer cities or health promoting schools (6•).

Theory and Evidence

Informational approaches

Informational health promotion campaigns have, on the whole, been a disappointment for policy makers and prevention scientists. Whilst substantial public funds are spent on such

campaigns, including those that relay responsible drinking messages, there is a paucity of evidence of their effectiveness (7••). However, there is evidence to suggest that the much publicised government recommended guidelines for alcohol use are generally ignored as they are believed to have little relevance to, and be unrealistic for, people's drinking behaviour (8). Similarly, a more sophisticated informational intervention that relies on providing personalised feedback about an individual's own drinking compared to how much their peers are drinking, called social normative feedback, has good evidence of weak or no effects (9••). The same applies to social cognition interventions based on well-established psychological theories, such as the theory of reasoned action and planned behaviour, and derivatives such as the theory of triadic influences, which propose that behaviour is mediated through cognitive intentions to engage in behaviour (10, 11).

The evidence for screening and brief interventions (SBIs) in primary health care is mixed. SBIs have been found to be effective for addressing hazardous and harmful drinking in middle-aged males, but there is a paucity of evidence for females, younger and older drinkers, those from ethnic minority groups, and in different settings (12••). For example, whilst SBIs are likely to be cost saving in the long-term in the UK, their provision in England is limited and inconsistent (13, 14). Fewer than 10% of patients who drink excessively (AUDIT score ≥8) reported having received a brief intervention from their GP, and provision is disproportionate towards males (13).

Digital interventions, delivered online via websites or mobile applications ('apps') have emerged as an increasingly popular format for both universal and targeted informational prevention. Digital interventions offer advantages over face to face interventions because of their potential to reach large numbers relatively cheaply, without the need for an individual to

attend a consultation (15). In recent years a large number of digital interventions have been developed, with the aim of exploiting this potential. Indeed, the UK National Health Service (NHS) has created an 'app library' with the aim of organising some of the large numbers of available health apps into an accessible resource for patients (16).

However, evidence suggests that many publicly available medical apps are of poor quality and are unregulated and untested (17). This has implications for the privacy and safety of people who use them. Research to determine the effective features of apps, or the mechanisms of action by which they bring out behaviour change is also still in its infancy. A review of the content of apps for reducing alcohol consumption suggested than none were based on theory, and few mentioned any effective behaviour change techniques (BCTs) (18). A recent Cochrane review paints only a slightly more positive picture of the potential for digital interventions for alcohol reduction (19••). Fifty-seven studies were examined, and alongside determining effectiveness, the authors explored their use of theory and BCTs. Findings showed that when performance bias in included studies was controlled for, the overall effect size dropped from around three drinks per week to around one drink per week, with substantial heterogeneity. Remaining methodological and bias issues cannot be discounted as contributing to this remaining, small, effect. The review authors also stress that publication bias might be an issue, and whilst they found that none of the included studies reported any adverse effects, others have reported the possibility of iatrogenic impacts from digital interventions in some populations (20).

In this light of this evidence, it seems that the shift towards digital interventions is based on naïve and untested assumptions of 'technological utopianism' or economic cost-effectiveness, rather than a rigorous and systematic evaluation of the available research evidence. There is

clearly much more work to be done if we are to understand and exploit the potential benefits of digital interventions as effective informational prevention tools. One must also consider the possibility that informational interventions, on their own, are unlikely ever to be sufficient. Such interventions require the conscious engagement of individuals and fail to account for impulsivity, habit, self-control, associative learning, and emotional processing, all of which may have a greater influence on behaviour (21, 22).

Skills development approaches

School-based life and social skills development interventions focus on personal competencies: they teach generic self-management personal and social skills, such as goal-setting, problem-solving and decision-making, and also teach cognitive skills to resist media and interpersonal influences, to enhance self-esteem, to cope with stress and anxiety, to increase assertiveness and to interact with others. Some skills based prevention programmes, such as the European Unplugged program combine the more developmentally oriented social skills approach with the informationally oriented social normative feedback approach (23). But, whilst this combined approach has shown significant results in trials and in meta-analyses, the lifetime prevalence effect sizes are quite small and the follow-ups are usually relatively short. As Faggiano et al conclude, if used they should form part of more comprehensive strategies for substance misuse prevention in order to achieve a population-level impact (24••).

Although school-based prevention curricula on their own have, at best, only limited effectiveness, there is some good evidence for the impact of programmes that strengthened teachers' classroom management skills, in turn improving child on-task behaviour and pro-

social development. The best illustration of an effective classroom management prevention intervention is the Good Behaviour Game (GBG) for primary/elementary school children, highlighted as an effective developmental substance misuse prevention intervention in the Cochrane reviews by Faggiano et al. and Foxcroft and Tsertsvadze (24••, 25). In a longer-term follow-up study the GBG reduced lifetime alcohol abuse and dependence disorders in those who were in GBG classrooms (13%) at age five or six, compared with those in standard classrooms (20%) (26). Importantly, sustained effects were also found for other substance use outcomes and service utilization measures, with stronger effects seen in boys identified at age six as highly aggressive and disruptive (27). There was, however, generally a lower effect found for females, nor were the results so clear cut in a second, replication study over the same time period (26).

Environmental approaches

Behaviour may be much more automatic and spontaneous than previously theorized, and many environmental prevention interventions aim to alter behaviour at the non-conscious level. Choice architecture, or "nudge" interventions are designed to "alter people's behaviour in a predictable way without forbidding any options or significantly changing their economic incentives" (28). For example, reducing the size of wine glasses to reduce wine consumption (29, 30). However, the evidence base for choice architecture interventions and alcohol misuse is currently sparse. For example, alcohol server training, which, in part, is designed to encourage bar staff to "nudge" intoxicated patrons towards the purchase of soft drinks has limited evidence of efficacy. The low-quality evidence that exists suggests that there is a lack of compliance with these voluntary interventions and that mandatory interventions are likely more effective (31).

Minimum unit pricing (MUP) for alcohol is one such mandatory intervention that has been shown to impact consumption, and is therefore a relatively strong environmental prevention intervention (32, 33). Following legislation that was approved by the Scottish Parliament in 2012, in November 2017 the UK Supreme Court ruled that Scotland could set a 50p per unit minimum price of alcohol. This means that Scotland is likely to become the first country in the world to set an official minimum unit price for alcohol. Judges ruled the measure to be "a proportionate means of achieving a legitimate aim". Models estimates suggest that MUP may well achieve aims of reducing alcohol consumption, and alcohol-related harms and their associated costs (34••). It is estimated that the impact of MUP will be greater for higher-risk alcohol consumers, and, importantly, lead to reductions in health inequalities: something that many alcohol prevention interventions fail to address (34••, 35).

Similarly, a minimum age to legally purchase alcohol is an effective regulatory preventive approach. Following a call for the minimum legal drinking age (MLDA) in the United States of America (USA) to be reduced from 21 to 18, a review was undertaken to assess the effect of a MLDA of 21 on alcohol harm prevention (36). The authors concluded that a MLDA of 21 has reduced the number of alcohol-related traffic accidents, reduced youth alcohol consumption and has prevented long-term negative outcomes into adulthood.

Reducing alcohol outlet density is a less effective environmental prevention intervention. Whilst it is likely to have a small effect on individual level alcohol use, these effects are variable and do not translate to a reduction in alcohol attributable hospital admissions (33, 37••).

Another less effective environmental prevention intervention is bans on drinking applied to specific individuals, such as bans on entering certain licensed premises under the Pubwatch Scheme, and street drinking bans (38, 39). Pubwatch schemes likely lack efficacy as their voluntary nature means that the most problematic licensed premises often do not participate (39). Additionally, due to the limited geographical areas in which these schemes operate, the problems associated with drinking are often displaced to a neighbouring area (39). Whilst Pennay and Room highlight that there is no peer-reviewed academic literature on the impact of street drinking bans, a common theme elicited from research reports is that they result in negative impacts on marginalised groups (38). Unfortunately, as Room states, even with an absence of evidence of efficacy, emphasis is placed on individualised control measures by contemporary politicians who perceive it to be the path of least resistance (39). These politicians need to seemingly attempt to curb alcohol problems, whilst also pandering to the alcohol industry (39).

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Conclusions

This taxonomy can be used to organise, classify, identify the need for, and plan, alcohol misuse prevention strategies and research. For practitioners and researchers with a focus on environmental prevention, these subcategories can be incorporated into the matrix. That is not to say that informational and developmental prevention do not have subcategories, but they are not the specific focus of this paper.

There is not one single prevention category that has comprehensive evidence of efficacy. Rather, there is a paucity of high-quality, or inconclusive, evidence for some well-established

interventions across the different categories. Within each prevention category there are interventions which are more, and less effective. The strongest evidence supports environmental prevention interventions such as prohibition of alcohol purchasing by minors and MUP. Environmental prevention interventions are often more efficient and less costly than informational or developmental interventions, which can utilise complex systems or can require direct contact with people (22). Importantly, they have the potential to reduce health inequalities as they often do not require the intended recipients to be health literate, numerate or have high-functioning cognition (22, 40). It would appear, therefore, that future alcohol misuse prevention efforts should seek to change the context for behaviour by implementing effective environmental prevention interventions. However, it would be naïve to believe that environmental prevention is sufficient in itself. Rather, comprehensive, systems oriented, prevention coverage should combine all three functional approaches.

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