

# Beyond intention: do specific plans increase health behaviours in patients in primary care? A study of fruit and vegetable consumption

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## Abstract

Increasing evidence suggests that implementation intentions are effective in moving people towards achieving health behaviour goals. However, the type of health behaviours for which they work best is unclear. Furthermore, implementation intentions appear to be less effective when studied in clinical rather than student populations. This prospective study tested implementation intentions with a complex, repeated health behaviour in a patient sample. A total of 120 cardiac patients in the UK were asked to increase their daily fruit and vegetable consumption by two portions and to maintain this over 3 months. Participants were randomly assigned to three groups (control, Theory of Planned Behaviour (TPB) questionnaire, TPB questionnaire + implementation intention) and telephoned at 7, 28 and 90 days follow-up to record daily consumption (24-h recall measure); 94 participants completed the study. Daily fruit and vegetable consumption increased from 2.88 portions (SD = 1.67) at recruitment to 4.28 portions (SD = 2.25) at 90 days. A 4 × 3 (time by group) mixed design ANCOVA was computed with daily fruit and vegetable consumption at recruitment entered as a covariate. This revealed a significant time effect ( $F(3, 270) = 29.79, p < 0.001$ ) ( $\eta^2 = 0.25$ ) but non-significant group ( $F(2, 90) = 0.32, p = 0.73$ ) ( $\eta^2 = 0.07$ ) and time by group effects ( $F(6, 270) = 0.48, p = 0.82$ ) ( $\eta^2 = 0.01$ ). There was also a significant main effect of the covariate ( $F(1, 90) = 48.51, p < 0.001$ ) ( $\eta^2 = 0.35$ ) and a significant time by covariate effect ( $F(3, 270) = 12.14, p < 0.001$ ) ( $\eta^2 = 0.12$ ). Substantial increases in fruit and vegetable consumption were achieved particularly by participants who were eating low levels at recruitment. Consumption was not improved by implementation intentions. These findings are discussed in the context of the targeted health behaviour and sample.

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## Introduction

In order to promote positive health, public health practitioners must help overcome obstacles related to poverty, social exclusion, unemployment and poor housing (Department of Health (DOH), 1999). Health

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outcomes are also affected by individual behaviours. Indeed, individuals can contribute to their own health by adopting and maintaining health promoting behaviours (e.g. physical activity) and avoiding risk-associated health behaviours (e.g. smoking) (DOH, 1999).

Eating adequate amounts of fruit and vegetables on a daily basis is an important individual health promoting behaviour. It is currently recommended that people eat at least 400 g or five portions of fruit and vegetables each day in order to protect against coronary heart disease (CHD), stroke and cancers (DOH, 1994, 1998; US Department of Health and Human Services, 2004). This recommendation applies equally to healthy individuals and those with existing heart disease (DOH, 2000a). However, the current average UK daily consumption of fruit and vegetables is less than this recommended amount. On average men consume 2.7 portions per day and women consume 2.9 portions per day, with just 13% of males and 15% of females eating the recommended five portions per day (Henderson, Gregory, & Swan, 2002). These figures compare poorly to the US, where almost a quarter of the population eat at least five portions each day (National Center for Chronic Disease Prevention and Health Promotion, 2004). Furthermore, there are differences in consumption by income with households on lower incomes eating less (Hunt, Nichols, & Pryer, 2000; Steptoe et al., 2003).

The current UK government is committed to tackling this under-consumption of fruit and vegetables in the general population and cardiac patients (DOH, 1999, 2000a–c). Standard Three of the National Service Framework for CHD (DOH, 2000a) requires general practitioners and primary care teams to collect data on the effectiveness of providing advice on diet to cardiac patients. Interventions to increase fruit and vegetable consumption in this clinical population are now a key priority, to obviate the need for statins which are often used to lower blood lipids, thus reducing the risks from high consumption of saturated fats (Hooper, 2001).

In order to promote positive health behaviours such as eating fruit and vegetables, the modifiable factors that predict this behaviour need to be identified. The Theory of Planned Behaviour (TPB; Ajzen, 1985) is a well-established social-cognitive model that has been used to further understanding of health behaviours (Armitage & Conner, 2001; Godin & Kok, 1996). The TPB states that the proximal determinant of behaviour is the intention to perform or to not perform that behaviour. Intention is determined by attitude towards the behaviour, subjective norm (perceptions of social pressure to perform the behaviour) and perceived behavioural control (PBC, perceptions of whether performing the behaviour is under the individual's control and the perceived ease or difficulty of performance). PBC can also influence behaviour directly in situations when it closely matches actual control. In general, the more

positive one's attitude and subjective norm and the greater one's control, the more likely one is to form a strong intention and to perform the behaviour. There is empirical support for the theory across a broad range of behaviours. In a meta-analysis of 185 studies, the model accounted for 39% of the variance in intentions and 27% of the variance in behaviour (Armitage & Conner, 2001). In a review of 58 health behaviour studies, including addictive behaviours, healthy eating, physical activity, using condoms, clinical and screening behaviours, Godin and Kok (1996) found that on average the model explained 41% of the variance in intention and 34% of the variance in behaviour.

One of the criticisms of the TPB is that it explains high proportions of the variance in intentions, but is a weaker predictor of actual behaviour. This means that many people with positive intentions do not go on to perform the intended behaviour. Behavioural enactment models such as Gollwitzer's Implementation Intentions (Gollwitzer, 1993, 1996, 1999) address this limitation by distinguishing between the motivational and volitional stages of behavioural enactment. In the motivational stage outlined in the TPB, an individual forms a goal intention, i.e. makes the decision to perform a behaviour. In the subsequent volitional stage, the individual forms specific plans or implementation intentions that state exactly when, where and how the goal is to be achieved. Goal intentions take the form of 'I intend to do X', whereas implementation intentions specify 'I intend to do X at time Y in place Z'. It is proposed that implementation intentions work by arranging for environmental cues to exert additional control over the behaviour enactment (Gollwitzer, 1993, 1999). By specifying when and where the behaviour will be performed, the behaviour becomes linked to the environmental cue, which leads to the automatic elicitation of action when this cue is encountered.

Increasing evidence suggests that implementation intentions are effective in moving people towards achieving behavioural goals. Three meta-analyses have tested implementation intentions in achieving goals and performing behaviours (Gollwitzer & Sheeran, 2003; Koestner, Lekes, Powers, & Chicoine, 2002; Sheeran, 2002) and have reported medium effect sizes of 0.63, 0.54 and 0.70, respectively. In terms of health behaviours, a recent systematic review (Bridle, Steadman, & Jackson, 2004) found that implementation intentions alone (rather than implementation intentions plus a motivational intervention) significantly increased performance of health behaviours compared to controls in eight of the 14 studies reviewed. There were insufficient studies available to assess the types of health behaviours for which implementation intentions were effective. Indeed, from the research to date, it is unclear whether implementation intentions work better for single, one-off behaviours (e.g. attending cervical cancer screening,

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