

THE APPLICATION OF STAGING MODELS TO THE UNDERSTANDING OF HEALTH BEHAVIOUR CHANGE AND THE PROMOTION OF HEALTH

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(Received 7 November, 1997; in final form 23 March, 1998)

Health behaviour change programs should be based not only on relevant and demonstrably effective strategies, but also on relevant theories or models. Models such as Social Learning Theory/Social Cognitive Theory and the Transtheoretical Model of Change, for example, may be applied independently or together in a way that may lead to improved intervention outcomes. This paper examines staged approaches to health behaviour change and promoting health, and illustrates how key concepts and variables from other models can be used in conjunction with such a framework to develop more tailored and targeted strategies. An overview of the literature in this field is provided, as well as a description of several case studies where interventions based on matching of theories or models have been successful. The potential for extension of the application of such theories from an individual framework to multiple levels, and at an organisational level or environmental level are explored, whereby the potential reach of intervention programs beyond a relatively small number of individuals is increased while still maintaining acceptable program exposure.

KEY WORDS: Health behaviour change, health promotion, transtheoretical model.

INTRODUCTION

Health behaviour change programs should be based not only on demonstrably effective strategies which are relevant to the particular health behaviour(s) being influenced, but also on theories or models which are relevant to the health problem being addressed in particular settings (Glanz, Lewis and Rimer, 1997; Green and Kreuter, 1991; Hochbaum, Sorenson and Long, 1992), and towards the effective dissemination and diffusion of those programs (Oldenburg, Hardcastle and Kok, 1997).

Health psychologists and other behavioural scientists have given considerable attention to models of individual health behaviour such as the Health Belief Model and the Theory of Reasoned Action, and more recently to models of interpersonal behaviour such as Social Learning Theory or Social Cognitive Theory (Glanz *et al.*, 1997). However, much less attention has been given to models or theories which attempt to understand health behaviour change within groups, organisations and even whole communities. The design of programs to reach populations, not merely individuals (which after all, is a fundamental aim of the public health approach) requires an understanding of how social systems operate,

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how change occurs within and among systems, and how large-scale changes influence people's health behaviour and health more generally (Glanz *et al.*, 1997; Oldenburg, 1994).

A review of the use of theory in major health education journals found 51 distinct theoretical formulations discussed or applied in 116 theory-based articles (Glanz *et al.*, 1997). The most often-employed theories were Social Learning Theory (23 articles), Theory of Reasoned Action (19 articles), and the Health Belief Model (16 articles). The authors (Glanz *et al.*, 1997) concluded that not only did no single theory or model dominate the field but also that there has been relatively little published methodologically rigorous intervention research with strong and explicit theoretical underpinnings, other than in a few key settings such as schools and the workplace. Since that time, several publications have begun to address applied theory (e.g. Hochbaum *et al.*, 1992). A followup review, by Glanz and Oldenburg (1997) widened the coverage of journals from only health promotion and education journals to include journals in the area of preventive medicine and health psychology. While Social Learning Theory/Social Cognitive Theory and the Health Belief Model remain prominent in health psychology and public health, the use of Stages of Change (SOC) as a central concept of the Transtheoretical Model of Change (Prochaska, DiClemente and Norcross, 1992) has also become widespread in recent years.

This paper examines staged approaches to health behaviour change and promoting health, and illustrates how key concepts and variables from other models (such as self-efficacy derived from Social Cognitive Theory) can be used in conjunction with such a framework to develop more tailored and targeted strategies. These strategies will, in turn, lead to the development of more effective public health programs. Such a combination of theories and models can be used to shift the focus of intervention strategies beyond a clinical or individual level to that of groups, organisations and social environments. Such strategies can also be usefully applied to a range of settings in the community, such as the workplace and primary health care, to increase the reach of intervention programs beyond a relatively small number of individuals, while still maintaining acceptable program exposure.

APPLICATION OF STAGING THEORY TO DISEASE PREVENTION AND HEALTH PROMOTION

Stages of Readiness to Change (Soc) Model

The idea that lifestyle change occurs in a number of steps is not a particularly new concept (e.g. Cashdan, 1973; Egan, 1975; Horn and Waingrown, 1966). However, the recent work of Prochaska and colleagues (Prochaska and DiClemente, 1992; Prochaska, DiClemente and Norcross, 1992; Velicer *et al.*, 1993), has formally identified the dynamics and structure of change that underlie both self-mediated and treatment-facilitated modification of addictive and other health behaviours. Alternate versions to their staged model can be found in the recent writings of Beitman (1986), Brownell, Marlatt, Lichtenstein and Wilson (1986), Dryden (1986), and Marlatt and Gordon (1985).

Prochaska, DiClemente and Norcross (1992) argue that although there is now substantial evidence demonstrating that people can modify behaviours as diverse as alcohol abuse, obesity, smoking and opiate use (e.g. Cohen, Lichtenstein *et al.*, 1989; Orford, 1985; Roizen, Cahaland and Shanks, 1978; Schachter, 1982; and Tuchfeld, 1981), there

has been little understanding of the steps and processes involved until quite recently. This understanding is clearly an important prerequisite for developing and using intervention strategies more widely and effectively, both in clinical settings and elsewhere in the community. The Transtheoretical Model specifies a series of independent variables, called the *processes of change*, a temporal ordering called the *stages of change*, and a series of intervening or outcome measures (Velicer *et al.*, 1993). Prochaska and colleagues (1992) have labelled the stages, *Precontemplation*, *Contemplation*, *Preparation*, *Action*, and *Maintenance*.

Precontemplation stage

At this point, lifestyle issues are not high on an individual's "personal agenda" and s/he is not considering the benefits of lifestyle change. Precontemplators are not convinced that the negative aspects of the problem behaviour outweigh the positive, or may simply be unaware that they have a problem (e.g. that a high fat diet is unhealthy, and/or that their diet is high in fat). Moving ahead to the next stage appears to be dependent on three factors: taking "ownership" of the problem, increasing awareness of the negative aspects of the problem and accurately evaluating one's ability and capacity to change (DiClemente and Prochaska, 1985).

Contemplation stage

At this stage, an individual begins to actively consider the benefits of lifestyle change, and maybe even intends to take some action to change, but s/he has not yet acted upon this intention. Additionally, they have started to evaluate the losses and rewards that successful change would bring.

Preparation stage

Individuals in this stage are ready to change and keen to take action, and they need to set goals and priorities. Often, such individuals have already engaged in processes, which have increased their ability to identify factors, which influence their lifestyle and the relevant health behaviours, and to initiate behaviour change. Sometimes they have made concrete plans such as signing up for a weight loss program or setting a "quit date" to stop smoking.

Action stage

During this stage, the individual begins to engage in active attempts to change or modify some aspect of his/her life. Action individuals require the skills to use key strategies in order to change habitual patterns of behaviour and adopt a healthier lifestyle.

Maintenance stage

If individuals make it to this stage, they have done so by continuing to actively make changes to their behaviour and lifestyle. Prochaska and DiClemente (1986) noted that for the addictive behaviours, six months appears to ensure that the person has really "quit". As noted by Prochaska and DiClemente (1992) and Prochaska and Goldstein (1991), occasions of relapse are more the norm than the exception. Even after six months of active attempts to make change, setbacks and reversals are common.

Consistent with Prochaska and DiClemente's (1992) stages of change formulation and similar other models of change, Brownell *et al.* (1986b) have proposed that an individual's achievement of long-term lifestyle change is accomplished in three basic stages. Stage I involves motivating, preparing and advising the person to change (Preparation), Stage II involves initial lifestyle change efforts (Action), and Stage III is characterised by attempts to help the person consolidate initial changes and build upon these in the longer term.

However, there is now much research at both a clinical and a population-level, which demonstrates how resistant health behaviours are to long-term modification. Indeed, an increasing body of research into the behavioural epidemiology of health risks indicates that at any particular moment in time, for any given health behaviour, such as smoking, most people in the community are not in the action stage or indeed, even the preparation stage of behaviour change. For example, aggregated data from a variety of studies and populations from developed countries, indicate that at any moment in time, approximately 10–15% of smokers are prepared for action, approximately 30–40% are in the contemplation stage, and the remainder are in the precontemplation stage (Abrams, Follick and Biener, 1988; Gottlieb, Galavotti, McCuan and McAlister, 1990; Pallonen, Fava, Salonen and Prochaska, 1992; Pierce, 1992; Prochaska, DiClemente and Norcross, 1992; Prochaska and Goldstein, 1991). Furthermore, most people taking action to change some aspect of their lives, do not succeed on the first occasion; many researchers have investigated this phenomenon of relapse from smoking cessation (Becona and Vazquez, 1997; Brownell, Marlatt, Lichtenstein and Wilson, 1986b; Ershoff, Quinn and Mullen, 1995; Murray *et al.*, 1997; Prochaska and Goldstein, 1991; Severson, Andrews, Lichenstein, Wall and Akers, 1997). Smokers, for example, take an average of three to four attempts at *action* before becoming self-changers (Oldenburg and Pope, 1990), and up to 80% of smokers who quit smoking will relapse over a 12-month follow-up period.

These phenomena are of course not peculiar to smoking. At least one-third of all patients fail to comply with any recommended regimen, with these rates usually being well over 50% where the recommendations relate to changing some aspect of lifestyle (Becker, 1985), such as exercise and diet (Foyet *et al.*, 1993). However, Prochaska and Goldstein (1991), among others, have noted that a large proportion of such individuals “recycle” back to the contemplation stage and prepare themselves for future action.

While Prochaska and colleagues developed their Stages of Change (SOC) model initially in response to research with smokers and ex-smokers in the general community (DiClemente, Prochaska *et al.*, 1991), accumulating research over the past 10 years indicates that these stages are common to a variety of groups of individuals and behaviours, including outpatient psychotherapy clients, outpatient alcoholism patients, weight control clients and head injury rehabilitation patients (Oldenburg and Pope, 1990). While most other health behaviours have been less well researched than smoking (Abrams, Elder, Carleton, Lasater and Artz, 1986), there are now excellent data emerging for physical activity (Booth *et al.*, 1993) and dietary change (Glanz *et al.*, 1994; Southard *et al.*, 1992).

With its application to organisations, Abrams *et al.* (1986), argue that the readiness of organisations to change is also quite variable, and that the goal of the health promotion agent is not simply to move individuals along the continuum of change but also to move entire organisations along such a continuum.

Measurement of Decisional Balance and Processes of Change

The decisional balance between the positive (Pros) and negative (Cons) can now be reliably and validly measured for a number of health behaviours, with the scales for measuring the *Pros of Smoking* and the *Cons of Smoking* (Velicer *et al.*, 1985), being the most well developed. These two scales have been successful in differentiating between five groups representing the stages of change in quitting smoking, and they have also been successful when employed as predictors of smoking status at a 6-month follow-up (Prochaska, Velicer, DiClemente and Fava, 1988).

The *Processes of change* can be measured by questionnaires which measure the 10 processes described by the Transtheoretical Model of Change (Prochaska *et al.*, 1988). Five of these (Consciousness Raising, Self-Reevaluation, Dramatic Relief, Environmental Reevaluation, Social Liberation) have been labelled as Experiential processes, and involve cognitive and emotional activities, while the other five (Counter-conditioning, Stimulus Control, Helping Relationship, Self-Liberation and Reinforcement Management) primarily involve behavioural activities or the labelling of behaviours. Again, the questionnaire for measuring these has been shown to be valid cross-sectionally, predictively and longitudinally (Velicer *et al.*, 1993).

Matching Intervention Strategies to Stages of Readiness to Change (Soc)

One of the real strengths of the Stages of Change Model is that it can be used to match the stage of change of either an individual or target group with particular intervention strategies; this can in turn, lead to both increased program exposure and overall program reach (Oldenburg and Pope, 1990). Matching treatment or intervention strategies to the needs of the client according to their readiness to change, also has important economic ramifications. Ockene, Ockene and Kristeller (1988), for example, showed that an intensive action and maintenance-oriented program directed at helping cardiac patients to quit smoking was very successful for patients who were either in action or preparing for action, but the program was ineffective with those individuals who were at the earlier stages of precontemplation and contemplation. The same result was found with pregnant women attending a United States Health Maintenance Organization who were offered a self-help smoking cessation program (Ershoff, Mullen and Quinn, 1989).

Therefore, if most individuals or organisations are not in the action stage (as appears likely), action-oriented programs are likely to be inappropriate for many individuals, particularly when those individuals are being targeted by relatively "low exposure" programs in non-clinical settings, such as the workplace and schools, and in the wider community. Indeed, precontemplators tend to avoid communication designed to help them change, and the most common pattern is for people to stay in the contemplation stage for at least two years (Prochaska and Goldstein, 1991).

In a study of 59 adults aged 59 to 80 years, Barke and Nicholas (1990) found clear evidence that the SOC model effectively distinguished between current levels of physical activity in older people. The authors then hypothesised that for programmatic interventions for older adults, those in precontemplation would perhaps benefit most from educational and attitudinal interventions about physical activity (which may be unnecessary for those in the action stages), whereas those in contemplation may need direct skill instruction and supported practice in new behaviours. Action stage people may need less support for initiation but more for maintaining and strengthening health behaviour change. Those in maintenance may require only continued access to activities in which to continue physical activity behaviours that have been established.

The SOC framework has been widely used in the development of a variety of intervention programs. Gomel, Oldenburg, Simpson and Owen (1993) reported the successful development and implementation of a three stage program for cardiovascular disease risk intervention with emergency services workers. Graham-Clarke and Oldenburg (1994) developed and evaluated a program to be used by physicians in primary health care settings for assisting their patients to quit smoking, change dietary behaviours and increase

physical activity. Southard *et al.* (1992) also proposed the use of such a model for increasing the effectiveness of the US National Cholesterol Education Program.

A recent development for improving the matching of the needs of individuals or groups, particularly according to readiness to change, with appropriate change strategies, involves the use of expert systems. For example, an expert system developed by Velicer *et al.* (1993) utilizes a computer-based decision-making system using client information to produce unique, matched information and interventions for smoking cessation.

Self-Efficacy and Social Cognitive Theory

Another major strength of the Stages of Change model is that it has also been used in conjunction with a variety of other theories and models which are relevant to different levels of influence at an intrapersonal, interpersonal, institutional, community or public policy level (Glanz and Rimer, 1995). Social Learning or Social Cognitive Theory, and in particular, one of its key concepts – self-efficacy – has been usefully employed in this way.

Social Cognitive Theory explains human behaviour in terms of a triadic, dynamic and reciprocal model in which behaviour, personal factors, and environmental influences interact (Glanz, Lewis and Rimer, 1997). It addresses both the psychological dynamics underlying health behaviour, and the methods for promoting behaviour change (Perry, Baranowski and Parcel, 1990). Because it synthesizes concepts and processes from other cognitive, behavioural and emotional models of behaviour change, it is a very complex theory and includes many key constructs. The basic theory and these various aspects are described in detail in Glanz *et al.* (1997), particularly in the chapter by Perry, Baranowski and Parcel (1990). In addition to the concepts of reciprocal determinism, behavioural capability, expectations, observational learning and reinforcement, self-efficacy is one of the key concepts. Self-efficacy, which refers to one's confidence in ability to take action and persist in action, has been seen by Bandura (1986) as perhaps the single most important factor in promoting changes in behaviour.

Many published individually focused and community-based health behaviour change and health promotion programs have been based extensively on Social Cognitive Theory utilising techniques that emphasise the cognitive and social mediators of behaviour. These include the Minnesota Heart Health Program (Mittlemark, Luepker and Jacobs, 1986), the Pawtucket Heart Health program (Lefebvre, Lasater, Carelton and Peterson, 1987), and the Stanford Five City Project (Farquhar *et al.*, 1990). These programs included strategies of observational learning or modelling, behavioural contracting, goal setting and self-monitoring of behaviour.

Integrating Key Concepts of Social Cognitive Theory with the Stages of Change Theory

As previously discussed, research into the Transtheoretical Model of Change has identified the importance of a number of variables, in relation to the *processes of change* and *decisional balance*, which help account for movement through the stages of change. Measures of self-efficacy and some of the other key concepts from Social Cognitive Theory have also been identified as key determinants of movement through the SOC impacting on decisional balance. Moreover, a number of the processes of change, such as

contingency management and stimulus control, are germane to many health behaviour change programs which have been based on Social Cognitive Theory. This theory can help us understand not only the habitual component of behaviour, and why it can be so very difficult for people to progress through the stages of change, but also that self-efficacy is a very important pre-requisite for change.

Brownell *et al.* (1986a) have reviewed the value of a variety of intervention strategies, including motivation-enhancing strategies, cognitive-behavioural approaches, social support and cue exposure across the various stages of change for smoking cessation. During the Preparation stage, adequately preparing the individual and enhancing motivation are probably the most important. During the intermediate post quitting stage, social support and the cognitive behavioural strategies of reinforcement and coping skills are most relevant. During the longer-term maintenance stage, it was concluded that the most important strategies are ongoing monitoring and vigilance, general lifestyle change, cue exposure. Additional strategies may include stress management and weight control (Oldenburg and Pope, 1990).

In an assessment of the decisional balance of pros and cons for smoking, Prochaska (1994) estimated that to help the sizeable percentage of the population of people at risk who are in the precontemplation stage, one would probably need to develop interventions that were powerful enough to increase about 1 standard deviation the pros of a healthy behaviour or the cons of not changing. That is, the intervention would have to be able to affect about 20% of the variance of these decisional variables. To obtain such large effects would require change strategies directed both at individuals and the public at large, through policy and other taxation changes. Taxes on tobacco, for example, can immediately increase the cons of not quitting, and reduction in health insurance and life insurance premiums for not smoking can immediately raise the pros of quitting (Prochaska, 1994). This interaction between readiness to change at an individual level, and the extent to which this can be impacted on by the application of social learning principles at a more community-wide level, will be the focus for much more research in the future.

Already, there are many recent, published examples of interventions based on Social Cognitive Theory which address behaviour change, not only at the individual level, but also change within the broader environment and community. Such an approach can be used to both initiate and stimulate movement from the Precontemplation to the Preparation and Action stages, as well as to maintain and institutionalise such change (Parcel, Simons-Morton and Kolbe, 1988; Simons-Morton, Simons-Morton, Parcel and Bunker, 1988).

Figure 1 illustrates a model which identifies how the "processes of change" as discussed by Prochaska and DiClemente (1992) and Brownell *et al.* (1986b), and concepts such as "decisional balance" and "self-efficacy" may be integrated with and have substantial impact on movement through the various Stages of Change.

It is clear that a number of theories and models are needed to understand the development and modification of complex behaviours, and that a theory such as Social Cognitive Theory can be usefully employed to understand the different stages involved in changing behaviours such as physical activity, diet and nutrition, and smoking. The following discussion provides some illustrative examples of applications of Social Cognitive Theory and Stages of Change to lifestyle change interventions in the primary health care setting (The Fresh Start Program) and the workplace (The Working Well Trial).

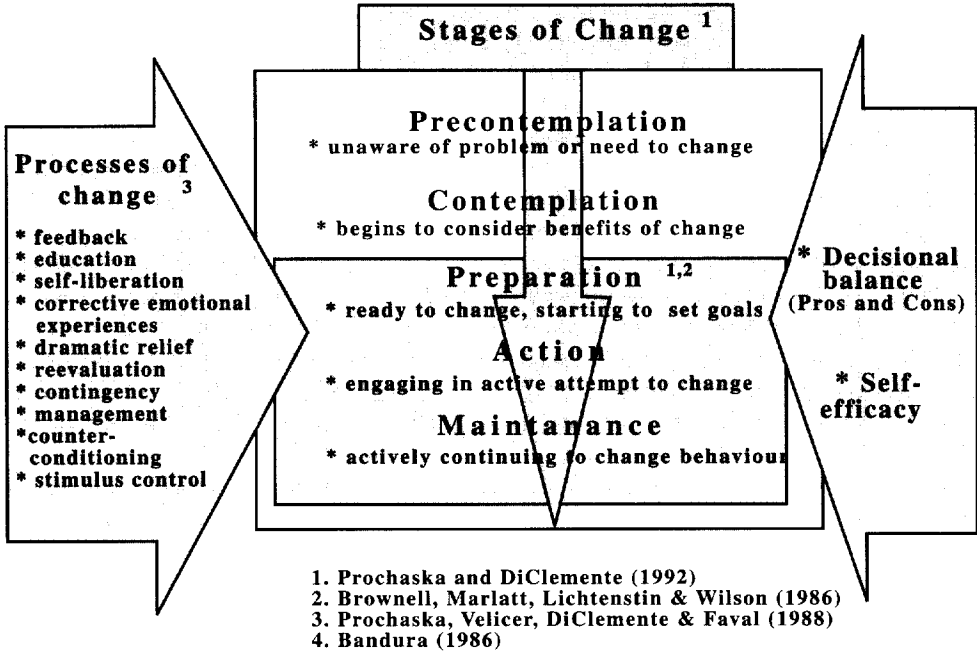


Figure 1 Integration of self-efficacy with key concepts from the Transtheoretical Model of Behaviour Change.

Changing Diet in the "Working Well" Trial

The Working Well Trial is a randomized, controlled, multicentre trial of worksite health promotion in 114 worksites in four regions of the US. It addresses multiple risk factors including nutrition, tobacco use, physical inactivity, and sun exposure (Abrams, Boutwell, Grizzle, Heimendinger, Sorenson and Varnes, 1994). Based on NCI Dietary Guidelines (Butrum, Clifford and Lanza, 1988), the central objective of the nutrition intervention is to decrease dietary fat intake to no more than 30% of calories, to increase the intake of dietary fibre to 20–30 grams or more per day, and to increase fruit and vegetable intake to an average of five servings per day (Abrams *et al.*, 1994; Glanz and Eriksen, 1993). Additional worksite objectives include increasing the availability of healthy foods in food service operations.

The nutrition intervention component of the trial involves the application of a combination of four theoretical models: consumer information processing (CIP), stages of change, Social Cognitive theory, and the diffusion of innovations (Glanz and Eriksen, 1993). It simultaneously focuses on individuals and worksite environments, and aims to produce change during a two to three year program, in three stages: awareness, action, and maintenance (Abrams *et al.*, 1994). This overall sequencing of interventions is based on the Transtheoretical model, which proposes that people are at various points along a continuum of readiness to change (Prochaska *et al.*, 1992). The emphasis on both individuals and the environment reflects the broad approach of Social Cognitive Theory (Bandura, 1986). The informational content of the nutrition intervention is influenced by the consumer informative processing (CIP) concepts (Glanz and Rudd, 1991), and the use of liaisons and Employee Advisory Boards in each worksite to disseminate the programs are examples of applications of the diffusion of innovations (Glanz and Eriksen, 1993).

Research methods and instruments were designed to capture not only the main results of the study, but also the impact of the theoretical models on the presumed determinants of dietary behaviour. Baseline findings revealed that predisposing factors (e.g. motivation, perceived benefits) were more significant determinants of diet than were enabling factors (e.g. social support, norms) (Kristal *et al.*, 1995). Results also showed a secular trend toward dietary improvement in both control and treatment sites, and a small, statistically significant change in the desired direction in dietary fat and fruit and vegetable intake (Sorensen *et al.*, 1996).

Stages of Readiness to Change were associated with fat, fibre and fruit and vegetable intake in a stepwise manner as predicted (Glanz *et al.*, 1994), and the SOC construct predicted between 8% and 13% of the variance of dietary intake, significantly more variance than that accounted for by demographic variables. In addition, the treatment worksites adopted more environmental and structural changes to increase availability and visibility of healthful foods (Sorensen *et al.*, 1996).

These findings have implications for the design of nutrition interventions. Such interventions are likely to be more effective when they are based on an understanding of the factors influencing food choice and familiarity with established theory and research on changing health-related behaviour. Because people are at various stages of receptivity for learning and applying nutrition information, intervention strategies in health promotion programs should be available for people at various stages of change. For example, providing detailed information on reading nutrient labels to someone in precontemplation would be a waste of resources. It would be more effective to attempt to increase that person's awareness and concern about nutrition and health before introducing action strategies.

Promoting Physical Activity in the "Fresh Start" Program

The Fresh Start Program was developed in Australia as a standardized approach to be used by physicians and other health professionals to reduce patients risk of cardiovascular disease through lifestyle change that involves smoking cessation, dietary change and increased physical activity (Graham-Clarke and Oldenburg, 1994). The programs have been based on a number of the key concepts derived from the Transtheoretical Model and Social Cognitive Theory. Each program includes application of both cognitive and behavioural strategies and techniques to improve patient skills at overcoming barriers to change, and to motivate, reinforce, and foster self-management of a healthy lifestyle. Physicians are provided with audiovisual and other educational aids in order to achieve this. Methods used in the preparation stage include self-instructional print and video materials, discussions with the patient to weigh the 'pros' and 'cons' of increasing physical activity (decisional balance), and strategies to make exercise personally relevant by emphasising the short-term or immediate benefits. In the action stage, already motivated patients receive help in setting attainable goals, individualising the exercise plan, and warming up and cooling down. The focus of the maintenance stage strategies is to prevent and/or manage relapse using theoretically derived strategies (Marlatt and Gordon, 1985) that are practical, affordable, and feasible to deliver in a primary care setting. Modelling is used extensively through the videos developed for both patients and physicians.

The Fresh Start Program was evaluated in a randomized controlled trial conducted in three regions surrounding Sydney, Australia between January 1991 and January 1993. Eighty volunteer practitioners (physicians) in 75 medical practices were randomly

assigned to one of three conditions: routine care, lifestyle counselling using video, and lifestyle counselling using videos and self-instructional materials. Each physician enrolled up to 20 patients in the trial, and physical activity was measured by questionnaire at baseline, 4 months and 12 months followup (Graham-Clarke and Oldenburg, 1994). While the overall effects of the intervention have been modest, there is at least some evidence of movement through the stages of change with, for example, the least physically active patients being more likely to move towards the preparation and action stages among about 20% of the patients in the study (Graham-Clarke and Oldenburg, 1994). The greatest benefits would seem to accrue to "high risk" males (Salked *et al.*, 1997).

Subsequent to the effectiveness trial, the Fresh Start program has been disseminated to over 500 physicians, who were provided with one of three dissemination strategies – mailout of a promotional pamphlet, small group educational workshops, or educational detailing. Principles of social marketing and diffusion theory were used in addition to Stages of Change and Social Cognitive Theory which had been used earlier in the development of the programs (Phongsavan *et al.*, 1995).

The Relevance of Staging Models to Public Health Approaches to Lifestyle Change and Promoting Health

Since the landmark Lalonde (1974) report on the health of Canadians and the Alameda County study (Belloc and Breslow, 1972), it has become increasingly clear that in order to prevent disease and promote health, it is not sufficient to only address lifestyle change at an individual level. The wider environment and the context in which change is being addressed are also very important; in particular, a range of social factors and socio-economic class warrant attention. The Ottawa Charter (WHO, 1986) recognized the importance of this social view of health by stressing that in order for health promotion to be effective, it must incorporate the following elements: the development of personal skills; the creation of environments which are supportive of health; the refocussing of health and related services; an increase in community participation; and finally, the development of public policy which is health enhancing.

In recent years behavioural scientists and other researchers have contributed to an exponential growth in behavioural epidemiological research directed at understanding the many social, cultural and attitudinal factors which are important determinants of some of the major behavioural risk factors. Sallis and Nader (1988), for example, argue for the critical role of the family in the development and alteration of health-related smoking, dietary and exercise behaviours. Bruhn (1988) in the same textbook (Gochman, 1988) provides an overview of the range of environmental, cultural, family and personal factors which have been shown to shape lifestyle and health behaviours.

With the identification of the importance of behavioural, cultural, social and economic factors as determinants of disease, there is a need for intervention strategies and approaches, particularly those focusing on lifestyle change, to take account of these. Stokols (1992) points out that to date, most health promotion programs implemented in community, corporate and clinical settings, have focused on change within individuals rather than the environment; and such programs have been designed primarily to influence change in individuals' health habits and lifestyles such as smoking and exercise. As argued by Winett (1995), however, many theoretically based health behaviour change programs have been less effective than the rhetoric would suggest. Winett (1995) suggests that at least part of the reason for this is that current theories have focused overly on

intrapersonal and other individual level variables, and have paid much less attention to social and environmental factors. Moreover, there is an increasing body of research which suggests the value of environmental (structural or organizational) interventions in addition to the more traditional behaviourally-focused lifestyle interventions (e.g. Archea, 1985; Green and Kreuter, 1990; Karasek and Theorell, 1990).

From an organisational or settings perspective, the Stage Theory of organisational change predicts how organisations develop and innovate new goals, programs, technologies, and ideas (Goodman and Steckler, 1990). This form of stage theory is based on research traditions of Lewin's work which emphasises that three stages are involved in the change processes in organisations: unfreezing past behaviours and attitudes and theories; moving exposure to new information, attitudes, and theories; and refreezing through processes of reinforcement, confirmation and support for the change. Diffusion of Innovations Theory is also critical to the understanding of how organisations develop innovations such as goals, programs, technologies, and ideas (Goodman and Steckler, 1990; Oldenburg, Hardcastle and Kok, 1997).

Oldenburg, Hardcastle and Ffrench (1996) have identified the extent to which relatively little attention has been given to researching those stages of innovation development and diffusion which follow on from the formalised phases of research. In essence, achieving effective diffusion of innovations, both within the general community and in organisational settings, involves a change process (Parcel, Perry and Taylor, 1990), and the change principles which underpin the diffusion process are not so different to those previously identified for understanding change at the individual, organisational, or community level. Both staging theories and Social Cognitive Theory, in particular can contribute to this understanding. However, there are also many gaps in our knowledge. For example, the extent to which some of those determinants, which have been shown to be relevant at an individual level, such as self-efficacy and decisional balance variables amongst others, are relevant within other settings such as the workplace and schools is not clear.

CONCLUSION

Many practitioners are most comfortable regarding "theory and practice as separate realms" (D'Onofrio, 1992). However as demonstrated by this paper, theories and models based on staging theories and Social Cognitive Theory may be used as a tool for developing and implementing effective public health programs. Moreover, there are increasing resources available for making theory accessible to practitioners (Glanz and Rudd, 1991), and for introducing and reinforcing it in a clear, useable, problem-based format (Glanz and Rimer, 1995).

In turn, just as staging is useful in clinical settings for determining the intensity and type of change strategy that is warranted, so staging can also be creatively applied to populations in the general community to match the intensity of preventive strategies to a target group's readiness to change or to segment a group in terms of readiness. This paper has demonstrated the scope of interventions, which are likely to be more successful if based on theoretical models such as Social Cognitive Theory and stages of change. However, several challenges remain. One concerns the application of the stages of change framework to change at an organizational and environmental level. Likewise, it remains unclear how environmental change strategies might effect or interact with stages of change at an individual level. The research available to date has laid a foundation for

these refinements of theory and the accompanying improvements in the effectiveness of health promotion practice.

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