

# Health Psychological Theory in Promoting Population Health in Päijät-Häme, Finland: First Steps toward a Type 2 Diabetes Prevention Study

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## Abstract

In public health promotion, behavioural science theories and theory-based methods should be translated into practical strategies that fit environmental conditions and are feasible for implementation. In this article, an effort to meet this challenge is presented. As a starting point we describe the conditions for development and success of the previous generation of public health promotion programmes in Finland. However, changes both in the population structure and in the population health bring new demands for programme development. We consider possibilities offered by health psychology and give a practical example of how theories and theory-based methods are applied in a community programme for type 2 diabetes prevention implemented in the Finnish primary health care.

## Keywords

*behaviour, health promotion, life-style, prevention, type 2 diabetes*

## Introduction

DESPITE a widely shared understanding of the biological and behavioural factors contributing to health and chronic disease, and the development of behavioural science theories and methodologies, we still face the problem of how to use the knowledge effectively in promoting the health of populations. Theories and models in health psychology provide information of factors underlying individual's behaviour, i.e. determinants of behaviour, as well as of methods that can be used to address these. However, translating the theories and theory-based methods into practical strategies that can be used in public health programmes so that the programmes will fit environmental conditions and be feasible for implementation poses a real challenge for the development of the field of health promotion.

In this article, we present an effort to meet this challenge. We first describe the conditions under which one of the very first public health promotion programmes, i.e. the North Karelia project (Puska, Tuomilehto, Nissinen, & Vartiainen, 1995), evolved and became successful. Second, we show how the Finnish society as well as the population health panorama has changed, bringing new objectives and demands for the development of health promotion programmes. In the third part of the article, we concentrate on the developments of health psychology theories that can be applied in changing people's behaviour. Finally, we describe how the theories and theory-based methods are used in a community programme implemented in the Finnish primary health care, aiming at prevention of type 2 diabetes, a chronic disease that currently poses a major threat to population health in Finland as well as in most other western countries.

## Lessons from the community intervention in North Karelia

In the 1960s, the Province of North Karelia in Eastern Finland was reported to have the highest total mortality rate of any human population of the era (Keys, 1970). The high cardiovascular mortality among the working age male population was contributing significantly to this state of affairs. By popular demand, and after

consulting with international experts about possible ways to alleviate the problem, a community prevention project was established to improve the situation (Karvonen, 1995). As its first task, the project established an information base and later devised an organizational structure for the implementation of a programme to diminish cardiovascular disease in North Karelia (Puska et al., 1995).

In the 25 years of the North Karelia Project, between 1972–1997, the coronary heart disease risk factor levels were reduced substantially, and related mortality decreased by about 60 per cent among the working age population. Although the focus of the project had been on male gender, the effect was found also among women (Vartiainen, Jousilahti, Alftan, Sundvall, Pietinen, & Puska, 1998a, 1998b). Both population and high-risk prevention approaches were adopted in the study (Puska et al., 1995). Initially, the community intervention aimed at lowering cardiovascular morbidity and mortality by decreasing the total serum cholesterol level (and thus the LDL-cholesterol level) in the population, as well as by achieving smoking cessation among the middle-aged males. In the early 1980s, not only smoking cessation but also prevention of smoking as well as decreasing risks for other chronic diseases besides cardiovascular diseases became prominent, and the project was integrated into the WHO Country-wide Integrated Non-communicable Diseases Intervention program, CINDI (Puska & Uutela, 2001).

The North Karelia Project emphasized not only the medical end points (lowered mortality and morbidity rates) and the biological risk factors behind them, but also the role of health behaviour as an underlying factor—after all, smoking was one of the initial main targets. To be able to affect the population cholesterol level, it was also relevant to suggest profound changes in eating behaviour. At the time, normal diet consisted of dairy products high in saturated fat such as whole milk and butter, which was used not only on bread but also in baking and cooking. In that situation, it was rational to begin with raising the public knowledge of health risks using universal messages and with promoting the availability of healthy consumer products. The project concentrated on distribution of information, negotiating with

business to get desired foods to the shops and co-operation with representatives of relevant social organizations for implementation of the programme. However, also methods such as modelling and skill building were used (Puska, 1995).

The importance of health behaviour monitoring for the North Karelia project was understood early, and two initial surveys were carried out already in the years 1972 and 1977. To highlight the significance of health behaviours in disease prevention, an annual health behaviour monitoring system covering the whole nation was established in 1978 (Helakorpi, Patja, Prättälä, & Uutela, 2001). As a sub-study, a special North Karelian sample was studied annually between 1978 and 1998 (Korpelainen, Nummela, Helakorpi, Kuosmanen, Uutela, & Puska, 1999). In all major descriptions of the project contents (e.g. Puska, 1995), behavioural and social science theories were given explicit consideration in the intervention mechanism.

Because of the above features, experiences from the North Karelia Project form a good basis for building new community intervention programmes, developing their instruments and implementing them in real life. However, several factors make a 'mechanistic' adoption of its findings impossible. First of all, a profound change in the organization of the Finnish society has taken place in the 1990s affecting the health promotion context. Municipalities, whose size varies from a few hundred persons to 550,000 with the median around 10,000, form the official and effective building blocks of the Finnish society. To increase democracy by bringing decision making to the local level, responsibilities of the welfare state were shifted to the municipalities, and their role in arranging health care was strengthened. Currently, the municipalities are rather independent decision-makers in how to provide the basis for welfare and well-being of the citizens. However, the economic recession cut dramatically down the resources at all levels, leaving municipalities with very little state support. Not only do the resources that are needed for provision of welfare vary greatly between the municipalities, but so do also the resources that are available for this task. Concurrently, the significance of NGOs and business enterprises has increased (Government Resolution . . ., 2001).

As the population is growing older, morbidity is increasing, even though with a slightly changing chronic disease panorama (Aromaa, Koskinen, & Huttunen, 1999). Today, patients with cardiovascular diseases often have metabolic syndrome and type 2 diabetes, too. Furthermore, while cardiovascular mortality has been reduced in the working-age population, it has remained intact in the entire population, due to disproportionately high mortality in some sub-populations and especially in the older, retired cohorts.

Also, some of the underlying causes for public health problems have altered. Public knowledge about factors contributing to health has increased, reflected in the shift towards increased consumption of low fat containing dairy products instead of high fat, vegetable oil instead of animal fat, and fruit and vegetables (Helakorpi et al., 2001). Both total energy intake, and energy intake from fat have lowered (Pietinen, Vartiainen, & Männistö, 1996). Simultaneously, however, both occupational activity and commuting activity have decreased (Barengo, Nissinen, Tuomilehto, & Pekkarinen, 2002), contributing significantly to decreased energy expenditure in the population. Sedentary life-style and obesity have led to the increased prevalence of metabolic syndrome and type 2 diabetes (Tuomilehto, Lindström, Eriksson, Valle, Hämäläinen, Ilanne-Parikka, Keinänen-Kiukaanniemi et al., 2001).

Currently, type 2 diabetes is a growing health problem and a burden for health care in Finland, as it is in the rest of the western world. The disease is a result of metabolic changes due to diet high on saturated fat and low on fibre, a sedentary life-style leading to decreased energy expenditure, and the resulting overweight (Lindahl, 1998). It has been estimated that 25 per cent of the Finnish population will get type 2 diabetes by the age of 75, the incidence increasing by 70 per cent during the first 10 years of this millennium. Already now, 11 per cent of the total health care cost goes directly to its treatment (DEHKO—Development Programme for the Prevention and Care of Diabetes in Finland 2000–2010).

## **Challenges and demands for health promotion in the present day Finland: Päijät-Häme Community Intervention**

Based on the research by the National Research and Development Centre for Welfare and Health, overall mortality was found to exceed the national average in the hospital district of the Province of Päijät-Häme in Finland during the period 1990–1995 (Häkkinen, Asikainen, & Linna, 1996; Häkkinen, Salonen, & Nordberg, 1995). This result was unexpected, since the region is close to the Capital area, which is the economical and administrative centre of the country. Despite its location, the economic structure in Päijät-Häme has remained relatively industrialized, with less information technology enterprises than in the Capital area. Furthermore, educational level is lower than national average, and unemployment rates in the province, and especially in its major town, Lahti (with 96,000 inhabitants), were high during the economic recession of the early 1990s. Even 10 years later, the long-term unemployment in Lahti was the highest among the 10 largest towns in Finland.

To improve the situation, collaboration was called for with several local institutions, forming a special Päijät-Häme Welfare Cluster. The Welfare Cluster is a conglomeration of all social and health care providers and educators in the hospital district, including the municipalities themselves, NGOs and business, as well the Lahti Polytechnic and the Palmenia Centre for Research and Continuing Education of the University of Helsinki in Lahti. The Päijät-Häme Welfare Cluster defined as its goals to promote welfare and health, to prevent diseases and to diminish health inequalities in the rapidly ageing and socio-economically unprivileged hospital district during the period 2001–2011. As the instruments for health promotion the Welfare Cluster designated:

1. A 10-year prospective cohort study to form the information basis and monitoring instrument among the ageing population, called *Ikihyvä Päijät-Häme* (Ever-good Päijät-Häme project).
2. Close co-operation with the municipalities to monitor the research project and to apply

knowledge derived both regionally and locally.

Collaboration was extended from the local to national research and educational institutions, and the National Public Health Institute, the UKK Institute for Health Promotion Research and the University of Helsinki became involved in the study.

Health education was seen as an important channel for health promotion in Päijät-Häme. In the scenario of rapidly increasing prevalence of type 2 diabetes, prevention of this life-style-related disease, also associated with high cardiovascular disease risk, became the primary target of health education. This led to the establishment of Päijät-Häme Community Intervention Study, a sub-project of the *Ikihyvä Päijät-Häme* project, with two focal areas of research:

1. Exploration of the prevailing practices of health education used in the primary health care for educating adults at risk for type 2 diabetes and cardiovascular diseases; and
2. Development of theory- and evidence-based methods for a life-style change programme that would be cost-effective and feasible for the use of primary health care.

In the next section, we consider some of the advancements in health psychology that have guided the development of the life-style change programme.

### **What can health psychology offer for health promotion: theories and models for changing people's behaviour**

Health psychology theories most commonly used in health promotion come from three different traditions that emphasize different aspects of behaviour change. Theories such as the theory of reasoned action and the theory of planned behaviour strongly emphasize the role of intention and factors underlying its formation, concentrating on attitudes and norms (Ajzen, 1985; Ajzen & Fishbein, 1980). Social cognitive theory sees behaviour as resulting from cognitive processes interacting with environmental events (Bandura, 1986). Behaviour is seen as goal-oriented, and action-outcome expectancies and self-efficacy

expectations are core determinants for achieving the goal. The third is a stage perspective, claiming that behaviour change proceeds through different stages, as the individual moves from a state where the idea of behaviour change has not occurred to him/her to the maintenance of the new behaviour. The most prominent theory in this tradition is the transtheoretical theory of stages of change (Prochaska & DiClemente, 1984) that separates the process of behaviour change into five distinct stages: pre-contemplation, contemplation, preparation, action and maintenance or relapse. According to the theory, individuals may start the process of change at any point, and also move back and forth between the stages (Prochaska & DiClemente, 1984).

For the purposes of health promotion, any single theory is undoubtedly insufficient. The attitude theories are powerful predictors of intention, but not so efficient in predicting actual behaviour (Bennett & Murphy, 1997). Furthermore, when past behaviour is included in the models, the effect of attitudes on intention is usually substantially weakened (e.g. Faulkner & Biddle, 2001). Stage models can be helpful in pointing at the need to address different determinants of behaviour change at different stages, but they have to be combined with theories stating what the determinants might be. Furthermore, behaviour- or context-specific constructs such as self-efficacy have different contents depending on what stage one is at.

The self-regulation theory and especially the formulations of distinct goal intentions and implementation intentions offers a way to overcome the gap between intention and behaviour (Bandura, 1997; Carver & Scheier, 1998; Gollwitzer & Brandstätter, 1997; Oettingen, Hönig, & Gollwitzer, 2000). Health action process approach (HAPA, Schwarzer, 1992; Schwarzer & Fuchs, 1995, 1996) incorporates the core constructs of social-cognitive theory such as risk perception, self-efficacy and outcome expectations into a two-stage model with distinct phases for motivation formation and action. Furthermore, planning is an important element in the model, bridging the two phases.

At the first stage in the HAPA-model, the person has to come to a point where he/she is considering the possibility to change. Here, risk perception, motives, self-efficacy in decision

making and outcome expectations contribute to goal intentions (Fig. 1). During the second stage, i.e. the action phase or volitional phase, implementation intentions help the person to materialize the goals. At this stage, the individual starts pursuing towards the goals, and self-efficacy and skills in overcoming the barriers and making use of the resources are crucial elements. The action phase can be subdivided into the following sequence: planning, initiation, maintenance, relapse management and disengagement. Each sub-stage advances from the previous one and, in addition, is facilitated by perceived self-efficacy. This requires that the intermediate goal is reached—and this is dependent upon formulation of specific short-term objectives (Schwarzer, 1999). By planning, situational circumstances or opportunities are cognitively linked to one's goal behaviour. If the appropriate opportunity for a desired action is clearly defined in terms of how, when and where, the probability for procrastination is reduced, and people take initiative when the critical situation arises. (Oettingen et al., 2000). As individuals function within several social systems, social network and support (Heany & Israel, 1997) are important factors to be considered both as potential resources and as barriers for behaviour change.

In creating health promotion programmes, it is not sufficient that the programmes are evidence- and theory-based. How theoretical constructs are used needs to be made explicit and the methods should be clearly tied to the constructs. Otherwise, the programmes cannot be evaluated, and the effective parts of them cannot be applied to other settings. However, even very detailed and thorough descriptions of planning, implementation and evaluation of health promotion programmes often neglect this task (e.g. Andersson, Bjärås, & Östenson, 2002). Intervention Mapping (IM, Bartholomew, Parcel, Kok, & Gottlieb, 2001) provides one useful framework to guide this effort.

IM suggests that each of the overriding preventive goals in a programme (e.g. reducing total fat intake) should be translated into proximal goals defined in terms of the participants' concrete behaviour (e.g. replacing whole milk with skimmed milk, eating one slice of cheese instead of two). IM also emphasizes the need

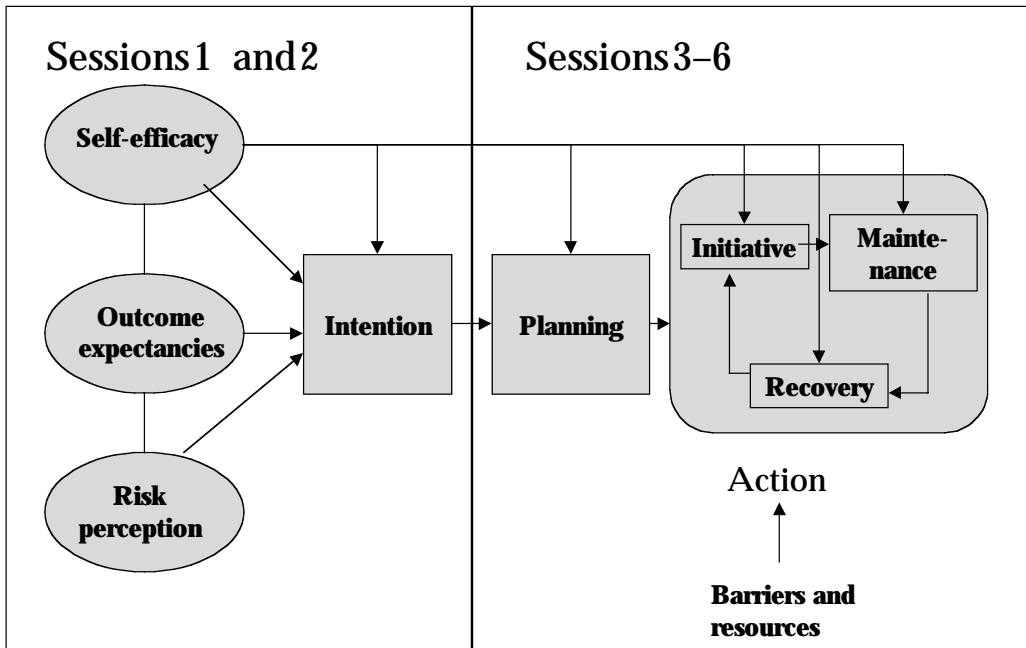


Figure 1. Design of the programme based on the components of the Health Action Process Approach.

explicitly to address the determinants of behaviour with theory-based methods that will be translated to practical strategies forming the programme. To ensure adoption and implementation of the programme, IM suggests the formation of a linkage group between the developers and the programme users. Finally, careful consideration of all the steps provides a framework for the evaluation of the programme.

In the last section of this article we will describe the context, subjects and design of a life-style change intervention in the Päijät-Häme Community Intervention Study. Intervention Mapping guided the development of the programme in a theoretical framework that was based on health action process approach and the self-regulation theory.

**Theory- and evidence-based life-style group intervention to prevent type 2 diabetes**

*Evidence for the effect of life-style change on the risk of diabetes*

Results of two recent randomized controlled trials provide evidence that type 2 diabetes can

be prevented by life-style changes targeting at diet and physical activity (Knowler, Barrett-Connor, Fowler, Hamman, Lachin, Walker, Nathan; Diabetes Prevention Program Research Group, 2002; Tuomilehto et al., 2001). Both these studies showed a decrease of almost 60 per cent in the disease incidence due to intensive face-to-face life-style counselling in comparison to the usual care condition. The life-style changes included dietary changes (reduction of fat and increase of fibre), increased physical activity and weight reduction. Encouragingly, life-style counselling was found even more effective than drug treatment (Knowler et al., 2002). Furthermore, even though presented in the diabetes prevention context, the instructions given can be seen as generally acceptable recommendations to promote health and prevent other chronic diseases as well.

*Study setting*

The study involves all 14 municipalities in the hospital district of the Province of Päijät-Häme. Eight of these municipalities have their own primary health care system, while the remaining municipalities organize it in collaboration,

forming two separate clusters of three municipalities. All municipalities are provided specialized health services by the hospital district.

According to the established Finnish practice, public health or diabetes nurses working in the primary health care centres give individual counselling consisting of dietary advice and recommendations to increase physical activity to patients coming to have their blood pressures measured or to patients referred by the physician because of overweight. These patients often also display a high risk for diabetes. As their number is rapidly increasing, the nurses are overburdened with demands for individual counselling. Moreover, many nurses still lack skills for individual an/or group-based health promotion and counselling. Furthermore, the cost-effectiveness of the counselling remains uncertain. Therefore, a less time-consuming group counselling method was regarded to be feasible for health education in the primary health care setting. A group approach has been found helpful in a number of physical activity change interventions (see, for example, Kahn & Heath, 2001). To ensure feasibility and implementation of the programme, a linkage group was formed, consisting of both programme developers and nurses working in the health care centres. The linkage group designed the recruitment protocol and the implementation plan.

#### *Recruitment of subjects*

Recruitment of the programme participants takes place at the primary health care centres, at the public health nurses' appointment. Clients aged 50–64 years and with at least a moderate risk for type 2 diabetes are offered an opportunity to participate in the programme. The risk status is determined by a risk factor questionnaire developed on the basis of epidemiological studies (Lindström & Tuomilehto, 2003). Moderate risk equals an estimated one in six chance of getting the disease during the following 10 years. Subjects with earlier diagnosis of diabetes, diagnosis of cancer, myocardial infarction or stroke during the last three months or substance abuse or mental disorder interfering with group activities are excluded from the programme. Twelve people are recruited into each of the groups. Altogether some 40 groups will be functioning during the year 2003.

#### *Goals for diet and physical activity change*

Programme goals are adopted directly from the Diabetes Prevention Study (DPS) that had five specific goals related to diet and physical activity (Tuomilehto et al., 2001). During a follow-up of average 3.2 years, none of the participants in the DPS-study reaching four or five goals had developed type 2 diabetes. As the participants in the study were people with impaired glucose tolerance and thus had a high risk of diabetes, the findings provided strong evidence for the efficacy of the goals in diabetes prevention. The goals were: (1) no more than 30 per cent of total energy from fat; (2) no more than 10 per cent of total energy from saturated fats; (3) at least 15g /1000 kcal fibre; (4) at least 30 min/day moderate intensity physical activity; and (5) at least 5 per cent reduction of present body weight.

#### *Goals for determinants' change*

Goals for determinants' change follow from the HAPA-model and from the self-regulation theory. Participants of the programme should acknowledge that they are at risk for type 2 diabetes; learn that the disease can be prevented by certain life-style changes; gain confidence in their ability to make the changes; make a decision to make the changes; plan where, when and how to make the changes; learn how to avoid barriers and how to use resources; and learn how to recover from relapses and gain confidence in doing so (see Table 1 for some of the goals in the intention formation phase).

#### *Programme outline*

The programme consists of six two-hour sessions facilitated by trained public health nurses, diabetes nurses and/or physiotherapists. A dietician participates in each group during one session, and in another session the group visits municipal sports and recreation facilities where possibilities for leisure time physical activity are presented.

The programme uses group approach based on empowerment ideology (Rappaport, 1987), emphasizing the participants' possibilities to make informed choices, and his/her role as an independent decision-maker who takes responsibility and regulates his/her own actions. The role of the facilitator is to enable and moderate discussion, give homework assignments and

*Table 1.* Examples of goals for intention formation, their determinants and theory-based methods and practical strategies used for their attainment in sessions 1 and 2

<i>Intention formation</i>	<i>Determinant</i>	<i>Theory-based method</i>	<i>Practical strategy</i>
I'm at risk for diabetes	Risk perception	Self-evaluation	Self-monitoring diet and physical activity
Life-style changes reduce the risk	Outcome expectation	Arguments	New information: studies on prevention
I can make a change	Self-efficacy	Re-attribution	Analysis of previous experiences

to strengthen the role of the group by ensuring that the participants can learn from each other, and get positive feedback and social support. The working methods are mainly adopted from cognitive-behavioural therapy, e.g. self-monitoring, problem solving and skill building (Egan, 1990).

Existing health education material is used where feasible (e.g. dietary advice and self-administrated test for the quality of fat from the Finnish Heart Association). Material used in homework assignments are partly created for this programme and partly adapted from those used in treatment for patients with metabolic syndrome at the Behavioural Medicine Clinic in the University of Umeå (Lindahl, 1998). The latter include a physical activity schedule, monitoring sheet for weekly eating habits, and the goal setting and goal planning framework.

Components of the programme are designed using the health action process approach (Schwarzer & Fuchs, 1995) and self-regulation theory (Oettingen et al., 2000). Following these theories, the first goal is to raise motivation for life-style changes that will result in the accomplishment of the diet and physical activity goals of the programme. The first two sessions are designed to target the factors underlying intention formation (see Fig. 1). According to the health action process approach, these determinants are risk perception, outcome expectations and self-efficacy in decision making. Theory-based methods and practical strategies are selected for the attainment of change in each of the determinants necessary for intention formation. Examples of these are given in Table 1. Programme components for all sessions are listed in Fig. 2.

After the intention to change has been

formed, concrete plans are needed on how, where and when to initiate action (Oettingen et al., 2000). The third session is designed to guide planning how to start increasing physical activity in one's everyday life. Goal setting is individually tailored, i.e. the participants are encouraged to find their own goals, with a special emphasis on normal routines that can be changed immediately (e.g. walking instead of driving, taking the stairs instead of the lift). The goals should be concrete, positive, attainable and developing, and the participants should be able publicly to commit themselves to them. The fourth session is identical in structure to the third, but with dietary habits as the target for change. In addition to the how, where and when, issues regarding the necessary 'equipment' are carefully considered in both these sessions. Equipment includes factors such as whether one needs to change timetable, to inform significant others of one's plans or to take appropriate clothing or a healthy snack along.

In the action phase, refining plans and moving on to subsequent goals are the main tasks. In doing this, environmental factors influencing success and failure are considered, and strategies in avoiding barriers and making use of resources are developed. The last two sessions of the programme are designed to target these factors.

#### *Evaluation framework*

Evaluation will be conducted in terms of attainment of the diet and physical activity goals; changes in the most significant type 2 diabetes related biological markers (blood glucose levels, cholesterol, blood pressure, weight and waist circumference); and changes in the determinants of behaviour. Furthermore, feasibility of the programme will be evaluated from both the



*Session 1*

Learning to know each other

Rules for the group

Discussion on current beliefs: how does life-style influence health?

Introduction by the facilitator: diabetes, risk factors & development, effects, prevention

Reflective discussion and re-evaluation of beliefs

Exercise: Dream—where do we want to be in 12 months' time?

How to make the dream come true: goals, planning, homework and other exercises

Homework assignments: monitoring own behaviour with food diary and physical activity schedule

*Session 3*

Feedback from the physical activity schedule

Introduction by the facilitator: health effects of physical activity

Goal planning:

- Discussion: are the selected goals concrete, positive, attainable, developing?
- Individual task: short-term (immediate) Where, When, How, 'equipment'
- Feedback from homework: difficult & easy situations, what to do?

Goal setting

Homework assignments: feedback and re-inforcement; monitoring physical activity and eating habits

Possibilities for physical activity in the local community: presentation of choices and facilities

*Session 5*

Discussion: evaluating and refining the goals

Discussion: routines—have they already changed? Physical activity schedule, fibre and fat tests

Individual task: intermediate goals (next 6 months)

Exercise: how to overcome barriers, how to use resources in maintaining the behaviour changes

Discussion of ways to create peer group support system

Homework assignments: monitoring physical activity and eating habits

*Session 2*

Returning of food diaries

Introduction by the facilitator: prevention really works

Evaluating own behaviour: feedback from physical activity schedule, fibre and fat tests

Discussion in small groups: comparison of own habits with the diet and physical activity goals sufficient for prevention

Role model stories with features contributing to success/failure

Discussion: analysis and re-attribution of previous successful/unsuccessful experiences

Homework assignments: preparation for goal setting, monitoring physical activity and eating habits

Discussion: barriers for group work and participation

*Session 4*

Food choices: feedback based on findings from food diaries

Introduction by the dietician: how to eat healthy?

Goal planning:

- Discussion: are the selected goals concrete, positive, attainable, developing?
- Individual task: short-term (immediate) Where, When, How, 'equipment'
- Feedback from homework: difficult & easy situations, what to do?

Goal setting

Exercise: how to make one's favorite food/dishes lighter?

Homework assignments: positive feedback in getting social support; monitoring physical activity and eating habits

*Session 6*

Discussion: evaluating the goals

Discussion: routines—have they already changed? Physical activity schedule, fibre and fat tests

Group discussion: analysis and re-attribution of success and failure

Discussion: future goals

Discussion: evaluation of the group work

participant and the provider perspectives, and by evaluating the cost-effectiveness.

Clinical measurements take place before the programme starts (T1), at three months (T2) and at one year (T3). Questionnaires on health behaviours and behavioural determinants are sent to the participants at T1, T2 and T3. Feasibility questionnaires are sent at T3. Detailed food diaries are collected at the programme start and at T3, and eating habits and physical activity are monitored in the homework assignments throughout the programme. Details of the participants' planning process will also be received from homework assignments.

## Conclusion

Randomized clinical trials have provided us with solid evidence of the impact of life-style factors on chronic diseases such as type 2 diabetes (Knowler et al., 2002; Tuomilehto et al., 2001). However, they are less clear about how the changes were acquired; what behavioural determinants had to be targeted in order for the changes to take place; and what methods turned out to be most successful. Even in the most thorough descriptions of development and implementation of comprehensive health promotion programmes (e.g. Andersson et al., 2002), a detailed description of these issues is lacking. Until this has changed, applications and efforts to replicate the success-stories in real life settings will be mere guesswork. In this article, we described an effort to integrate health psychology theories in a comprehensive way into the design of a community health promotion programme, showing explicitly how the theoretical constructs and theory-based methods are used. This, we believe, will allow for the evaluation of the components of the programme as well as the identification and later application of those that are proven successful into other settings.

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