

## Cardiovascular risk factors and motivation for a healthy life-style in a German community—results of the GP-based Oestringen study

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### Abstract

This paper explores the motivation of patients towards a healthy life-style in a small community with a special general practice and community-based health education program in order to identify reasons for different motivations and barriers and to improve preventive measures and outcome. The last of six standardised health surveys carried out over 9 years in the five general practices was therefore combined with a questionnaire to explore the attitudes of a sample of patients from these practices ( $N = 1044$ ) and all attendees of 11 health education courses ( $N = 153$ ). In addition to the cardiovascular risk factors, data were collected on sociodemographic factors and motivations for health promotion. The results show that, over time, the risk factors of hypertension ( $P < 0.001$ ) and smoking ( $P < 0.005$ ) had decreased. Health-promoting activities were not associated with cardiovascular risk factors; the motivations 'duty' and 'staying young' correlated with gender ( $P < 0.05$ ). Patients with good health and white collar professions were more active. About 20% specified specific barriers to health-related activities. As expected, the participants of an educational program were more highly motivated by 'fun', 'fitness' and 'meaningfulness'. This group was mainly female. Future preventive measures should take into account that motivation for health promotion depends more on psychosocial factors than on risk factors; frequent obstacles should be noticed in the community. © 2003 Elsevier Ireland Ltd. All rights reserved.

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### 1. Introduction

Since the seventies, community-based health programmes have been implemented in many western countries in order to prevent cardiovascular and other diseases [1–3]. Health education was an integral part of these programmes, although its effectiveness and efficiency could frequently not be proven [4]. In Germany, the special 'three level strategy' of general practitioners (GP) was implemented in the CINDI demonstration area (Countrywide Integrated Non-communicable Diseases Intervention program of WHO) [5]: this programme comprises a combination of the GP's consultation hours (1st level) educational group work in the practice (2nd level) and educational group work at community level (3rd level) which had proven to be effective in the German Cardiovascular Prevention (GCP) study

[6]. In the community of Oestringen, near Heidelberg, this programme has regularly performed health surveys in the general practices and in the 22 patient education groups since 1991. Oestringen has about 12,900 inhabitants; the educational groups continuously have about 300–400 participants. Similar to CINDI, Body Mass Index (BMI), blood pressure, smoking and cholesterol were used as health indicators [7]. After data pooling, the practice data and the statements concerning health and health behaviour reflect the health status of the local population [8,9]. While GCP showed significant improvements regarding cardiovascular risk factors, [6], further improvements were achieved regarding smoking and hypertension in our community [9].

Since motivation for a healthy life-style is not easy to maintain [10–12], and because nutrition counselling was no longer successful, we combined the survey of 1999 with a questionnaire concerning motivation, attitudes, and barriers for a healthy life-style. Two years after start of the health promotion programme, we examined the reasons why our patients and citizens were participating. Of primary

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importance were fun in common activities, the good feeling of doing something for one's health, the low costs, together with the easy access [13].

Based on these findings, and the experiences from other investigations of motivation and participation [14–16], we performed a study to gain more insight into patients' motivation for improving their life-style in our community. We expected that:

- the status of the four risk factors had not changed compared to the last year;
- health-promoting activities were particularly frequent in attendees of the educational courses;
- high motivation for health promotion depend on risk factors or perceived health problems;
- the motivation depends mainly on gender and education;
- barriers for participation are common and provide new relevant information concerning intrinsic and extrinsic motivation.

These assumptions were based on our experience as GPs [17] and on the Health Belief Model [18], the theory of self-efficacy [19] and the Transtheoretical Model (TTM) [20,21].

## 2. Methods

### 2.1. Setting and participants

The survey of 1999, as usual, was performed as a random sample of 1044 patients in the five large general practices of the community during 6 weeks in March and April [8]. In addition to the these, 153 health course attendants were recruited for the study (50% of all).

### 2.2. Procedures

As in the years before, about 10% of all patients older than 16 years were examined briefly and questioned by the doctors or a nurse when visiting the practice for whatever reason. Within 20 min, we had gathered the essential data (blood pressure, BMI, cholesterol, smoking, sociodemographic data) and the answers to our questions; the same procedure was carried out on 50% of the course attendants (11 of 22 courses) who were examined by the trained sports instructors in the course rooms. The practice nurse or the physician documented the risk factors. Patients of the GPs

who had already participated in an educational program were not included in the random sample. These patients of the random sample who specified none or private health activities knew of the possibility for participating in structured health courses. The participants in the educational courses were aware of all addressed measures.

### 2.3. Design

This is a cross-sectional study in the framework of a long-term intervention study in a specific community which started in 1991 (Oestringen Model).

### 2.4. Intervention

The intervention applies to the three level strategy of GP (Fig. 1): diabetics, smokers, hypertensives, overeaters or others are counselled as usual (1st level) and are referred to a patient education program (supporting course in the practice, 2nd level) if the patients fail to meet the agreed goals. We used different methods of counselling: brief advice, e.g. after screening, use of the five A's (ask, assess, advise, assist, arrange) [22] and well-structured group programmes, e.g. educational programmes by Basler et al. [23]. In order to maintain success and prevent relapse, there is an opportunity to associate with one of the 22 courses at community level (3rd level) for long-term motivation. All the courses provide not only gymnastics or jogging for at least 1 h a week but also a holistic counselling on nutrition, stress control, and medical advice for €30 per 6 months. Especially in the groups, patient education and counselling were designed for a good practice-based and community-based health climate. A local health guide is also available on the Internet (<http://www.dr-wiesemann.de>). The programme of the GP was well known and easily accessible.

### 2.5. Questionnaire

At first, a pilot study with 20 patients was performed in one general practice to provide additional validation of the planned questionnaire items, which had partly been derived from a questionnaire used in 1994. As a result, we eliminated the item of social support in groups (well-known, no relevance for differentiation) and left nine leading items. The main topics of the questionnaire addressed the following.

- (a) The degree of agreement towards being active for health reasons.

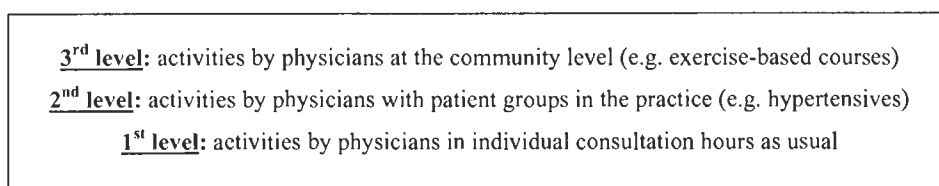


Fig. 1. The 'three level strategy' of primary care physicians.

- (b) The type of health-promoting activities, that is physical activity, healthy nutrition ('five portions a day' of fruit and vegetables), relaxation and stress control, and consumption of health-related products (e.g. vitamins, drugs).
- (c) The motivations and attitudes for healthy life-style. Different motivations and incentives for a healthy life-style could be expressed as follows: I'm active because ...
- It makes sense, it is an objective, a part of the meaning of life
  - Physical fitness
  - The duty I feel (responsibility towards myself and towards the society)
  - Anxiety, the concern about potential disease (worrying about health)
  - The feeling of staying young
  - It is fun.
- (d) In addition, we asked those who denied being active for health reasons and which barriers they claimed. Barriers included, e.g. lack of time, shift work, and special diseases. The possible answers were: yes, partly, less, no (multiple response).

After filling in, the questionnaires were checked for completeness by the staff (not by the doctor), collected immediately, and made anonymous. All participants were provided with instructions for filling in the questionnaire.

## 2.6. Statistics

A statistician made the calculations with SAS version 6; significance of difference between groups were calculated using the chi-square test.

## 3. Results

### 3.1. Participants

A total of 1196 individuals completed a questionnaire (1043 GP's patients and 153 course participants). Not one of

Table 2

Significant changes of prevalence in the GP-based Oestringen study (elevated blood pressure (WHO limit  $\geq 160/95$  mm Hg) and of smoking behaviour in 1992 compared to 1999)

Year	N	Prevalence in %	95% CI	P-value
Hypertension > 160/95				
1992	1157	28.4	$\pm 2.6$	<0.001
1999	1196	9.4	$\pm 1.7$	
Smoking				
1992	1166	20.8	$\pm 2.3$	<0.05
1999	1196	17.5	$\pm 2.2$	

the 153 course participants and only one patient of the practice sample refused to participate in the study. Whereas the distribution of sex was approximately equal in the practices (49.1% versus 50.9%), the women were predominant in the educational groups (84.3%). The mean age was 50.8 ( $\pm 16.2$ ) years and there was no significant difference between men and women. About two-thirds of the study participants had graduated from secondary school (66%), 18% from grammar school, and only 9% had higher education (college or university). Health was important for all age groups, to the extent of 90% for the younger and 97% for the elderly.

### 3.2. Risk factors

Though there was a slight deterioration of cardiovascular risks in recent years, smoking as a risk factor could be kept at 18% which is lower than in the GCP and the national reference (Table 1). Smoking and blood-pressure (limit 160/95 mm Hg) decreased significantly over 9 years [24] in contrast to BMI >30 (prevalence 1999: 17.5%) and cholesterol >250 (prevalence 1999: 22%) that did not change remarkably [17] (Table 2).

### 3.3. Health behaviour, health-promoting activities

Health-promoting activities were practised by 67.6% of the practice patients ( $N = 706$ ) and, as expected, by 100% of the course participants ( $N = 153$ ). Thus, 859 of the total (72%) said they were active in health promotion. There were no differences in relation to gender or education, but the

Table 1

Prevalence of elevated blood pressure (WHO limit  $\geq 160/95$  mm Hg) and of smoking behaviour before and during the Oestringen GP-based community study (national reference and intervention areas)

Study	Smoking behaviour		Hypertension $\geq 160/95$ mm Hg	
	N	%	N	%
1991 (GCP, national reference)	5311	33.9	5308	17.1
1991 (GCP, intervention areas)	8622	32.1	8622	14.6
1992 (Oestringen study 1992–1999)	1166	21	1157	29
1993	1055	16	1047	18
1994	1376	17	1370	20
1995	1265	17	1186	20
1997	1145	18	1107	16
1999	1196	18	1196	9

Oestringen was part of the GCP.

Table 3  
Healthy activities of the two different groups

Healthy activity	Patients in education program (N = 153)	%	Practice patients (N = 1044)	%	$\chi^2$	d.f.	P
Active in health promotion	153	100.0	706	67.7	65.76	1	<0.0001
If yes (multiple response)							
Physical activity	146	95.5	616	59.0	13.27	1	<0.0003
Healthy nutrition	91	59.7	278	26.6	20.16	1	<0.0001
Relaxation, stress control	90	59.1	115	11.0	105.06	1	<0.0001
Consuming health-related products	24	15.8	75	7.2	10.40	1	<0.0014

As expected, the course participants showed significantly more health-promoting activities. The single items remain significant after correcting the significance level according to Bonferroni ( $\alpha/\text{number of test} = 0.05/5 = 0.01$ ) highly significant.

course participants showed overall more health-promoting activities and not only in physical activity (Table 3).

Further results showed that individuals who felt their health status was 'well' were more active (55%) than those who were not well. A total of 74.6% of the women and 68% of the men reported health-promoting activities; 77.2% of the housewives, 70.1% of the pensioners, and 61.2% of the self-employed practised a self-reported healthy life-style. Women valued healthy nutrition and relaxation higher than men (38.2% versus 24.6% and 23.1% versus 11.2%, respectively). A total of 56.9% of the group aged 40–49 and 75.1% of the older participants (age 60–69) reported regular physical activity; 85.2% of the civil servants did so. Thus, the non-manual workers were more active.

Health-promoting activities related to risk factors showed that only 56% of the smokers were active compared to 70% of diabetics and hypertensives with 60% of individuals overweight (Table 4).

### 3.4. Motivation

Motivation regarding the preferred health-promoting activity deals with the type of motivation a person has. Table 5 shows the motivations for health-related activities for men

Table 4  
Healthy activities of both groups, related to the risk factors

	N	Active (%)	Not active (%)
Smoking	236	56.4	43.6
BMI ( $\geq 30$ )	199	61.3	38.7
Hypertension (RR $\geq 160/95$ )	129	62.8	37.2
Cholesterol ( $\geq 250$ mg/dl)	184	70.7	29.3
Diabetes type 2	96	70.8	29.2
Average of all active study participants	859	71.8	28.2

None of the different risk groups exceeded the average value of 72% of the whole study population. A total of 71.8% of the whole study population indicated activities in health promotion. None of the different risk groups exceeded this average value.

and women. Concerning the motivation items 'it is my duty' and 'I will stay young', the difference between men and women were significant.

The type of motivation was not only associated with gender, but also with age and education. The motivation 'makes sense' was reported by about 55% of the age group of 30–59 years, about 40% up to the age group of 70–79 years and the motivation 'fitness' was indicated by about 80% of the individuals under 60 years and by more than 50% even in

Table 5  
Type of motivation for health-related activities according to gender

Response	Fun				Fitness				Making sense			
	Male		Female		Male		Female		Male		Female	
	N	%	N	%	N	%	N	%	N	%	N	%
Yes	270	73.8	391	78.7	288	78.7	384	77.3	181	49.5	268	53.9
Partly	62	16.9	54	10.9	42	11.5	46	9.3	52	14.2	74	14.9
Less	13	3.6	20	4.0	5	1.4	13	2.6	22	6.0	30	6.0
No	21	5.7	32	6.4	31	8.5	54	10.9	111	30.3	125	25.2
Total	366	100.0	497	100.0	366	100.0	497	100.0	366	100.0	497	100.0
	Anxiety				Duty				Staying young			
Yes	141	38.5	227	45.7	86	23.5	146	29.4	89	24.3	168	33.8
Partly	80	21.9	102	20.5	59	16.1	98	19.7	86	23.5	86	17.3
Less	34	9.3	50	10.1	41	11.2	65	13.1	36	9.8	62	12.5
No	111	30.3	118	23.7	180	49.2	188	37.8	155	42.3	181	36.4
Total	366	100.0	497	100.0	366	100.0	497	100.0	366	100.0	497	100.0

Strong incentives were 'fitness' (78%) and 'fun' (76.2%); the difference of sex was significant to 'duty' and 'staying young' ( $P < 0.05$ ).

the group of 80–89-year olds. As expected, motivations like ‘duty’ and ‘anxiety’ did not appeal to the younger people as opposed to the age group of 30–49-year olds (especially female). ‘Staying young’ was important for the group of 50–59-year olds (e.g. 40% of the females). Higher-educated individuals were more highly motivated by the meaning of a healthy life-style (‘making sense’) and less by anxiety.

As expected, women valued healthy nutrition; as a further result this correlated positively with ‘making sense’ but negatively with ‘fun’, whereas ‘fun’ correlated positively with exercise and fitness. Table 4 shows that there was no remarkable correlation between health-related activities and risk factors compared to the average of the study participants.

In our study, 66.7% of the men and 63.5% of the women were motivated by their GPs to participate in health-promoting activities. A total of 53.3% of the patients of the five GP samples were familiar with the local health program; about the same number applied to the whole population. Nearly all the participants had read the health news in the local newspaper occasionally.

### 3.5. Barriers

A total of 20.8% of all participants reported barriers to health-promoting activities. About 9.5% of men and women indicated reasons, which can potentially be changed, such as lack of time or weariness; about 13.0% indicated reasons which are difficult to change, such as shift work or obligations of having to care for others. As expected, only 1.6%

Table 6  
Individual barriers to health-related activities ( $N = 214$ ): different reasons

Individual barriers	<i>N</i>
Diseases as reasons that could not be influenced	
Blindness	1
Anaemia	4
Nervous system	9
Vertebra column	3
Heart disease	11
Neoplasm	13
Rheumatism	14
Osteoarthritis	33
Total	88
Personal reasons that could be influenced	
Distance to place of exercise	5
Children	11
Occupational stress	10
Lack of time	57
Total	83
Other reasons, perceived as not being influenceable	
Conversion of a building	1
Construction job	1
Autonomy	4
Duty of care	6
Shift work	21
Total	88

of the course participants indicated such obstacles. Table 6 reports on the reasons which were given.

## 4. Discussion and conclusions

The three level strategy provides a promising strategy for educating patients and the whole community over a longer period of time. In particular, GPs have the chance to assist individuals and groups continuously. Given the negative experiences gained with the TTM in a general practice [25,12], we suggest to use structured consulting. Consulting according to the states of change method of TTM is possibly more successful when carried out together with courses for special risk groups [26].

The cross-sectional survey is very practicable for GPs, especially in this case, and provided a very high response rate compared to longitudinal or other cross-sectional studies because all the patients were questioned and examined simultaneously and only once, in the practice or in the course class room. No patient could be in both groups, there were no dropouts in the educational courses. Before making the questionnaires anonymous, the nurses or the sports instructors (not the doctors) briefly checked the questionnaires for completeness. The impact of the examination on the outcome may therefore be neglected. More comprehensive questionnaires such as parts of the Behavioral Risk Factor Surveillance System (BRFSS [27]), the Intrinsic motivation inventory [28], the PEP questionnaire [29] or the Multidimensional Health Questionnaire [30] were rejected by the GPs because of their size and the lack of clearly derived conclusions.

There was a gender bias in the educational group, but that is an expected result of our long-term study. It is well known that women report higher rates of health care utilisation than men [31]; on the other hand we appreciate the impact of women on their families.

Cessation of smoking, partially achieved with group therapy at the 2nd level [32], we assume, was a result of the various activities. It is known that doctors’ advice [33], special treatment with nicotine substitution [34], or campaigns may be successful. We used all three strategies, thus being very successful compared to the German average of 31% (men 24% versus 37%; women 15% versus 28% [35]), even though there may be a small bias because of the ‘practice-based population sample’. The fact that our study already had a relatively low percentage of smokers at the beginning can be explained by the fact that the community was already involved in the GCP Study from 1985 to 1991 (see Table 1). Hypertensive patients, another ‘high-risk’ group, were selected after practice-screening and offered the chance to attend a longitudinally evaluated group programme because of disappointing experience with the usual practice. The positive results of these groups [23] could be stabilised in shared meetings for physical activity at the community level, regardless of the lack of standardised

follow-ups [36]. There is of course a small bias in the practice population compared to the reference population of Germany because patients with hypertension visit the GPs regularly and they are therefore more highly represented in the sample. Though overweight and cholesterol only decreased in the first years, the local 'risk-map' of significantly decreased blood pressure and smoking behaviour is quite satisfying at the moment. This may be mainly due to the regular screenings and educational activities, which is similar the Danish group of Ebeltoft [37].

The number and type of health-promoting activities differed significantly between the patients from general practices and attendees of health courses. Especially healthy nutrition and relaxation played a higher role in the educational courses. But there was no significantly positive correlation between the number of risk factors and the health-promoting activities of the course participants or the patients of the practice sample (see Table 4). The activities of the smokers were rather limited. Therefore, we assume, the communication of a global risk is not sufficient in general practice; according to the Health Belief Model [18], patients will not give up beloved risk behaviours if there is no perceived high risk or no other advantage. However, patients who are suffering from hypertension or diabetes or ischaemic heart disease are probably more motivated to give up smoking [38]. The self-efficacy of exercise in an education program against back pain was underlined by Basler et al. [26] who tested the TTM of Prochaska.

In our study, the main motivation for most of the participants—in particular for exercise—was 'fitness' and 'fun', consistent with the study of Marcus et al. [39]. The motivations 'making sense, meaningful' or 'anxiety, worrying about health' were mainly reported by the older active patients, the course participants or, generally, by women (about 40%). We think that such a motivation pattern represents a long-term and regular personal profile [40]. Other investigations verify our expected result that women generally show more health consciousness than men [41,42]; we use this outcome to promote health in the family and even at community level. As assumed, patients with higher education or white collar professions showed higher motivation and participation; so target groups for preventive measures remain less-educated men, the group with the highest risk factors [43].

About 21% of the study participants provided information about barriers to health-promoting activities. The Health Belief Model uses obstacles or 'costs' as an explanation for the lack of realisation of intentions; the internal or external barriers to taking action on health were the most important predictors for preventive health behaviour [43]. In our study, many persons without health-promoting activities stated obstacles (87%). The reasons were similar as in other studies [29,15]. Bergler [44] presumes, as we do, that the persons who indicate lack of time or lack of necessity of action as barriers shift their own chances and responsibility into external non-influenceable reasons. This is the reason why

we should pay more attention to the mentioned barriers that play a major role in psychological models [21,45]. As expected, only 2% of the 153 course participants worried about obstacles.

Concerning cost effectiveness of the Health Belief Model [19], the benefit of our general practice-based three level strategy model is quite clear: as already in former years, 96% of the course participants stated patient education as useful. Especially the physical activity supports all the other health-maintaining measures, probably because of the internal motivation of fun and fitness, as already presumed.

In particular, the GP who is familiar with the individual problems and health resources of his patients is able to assess the resources of the patient using the five A's guideline [22] for promoting empowerment [20] and reducing some kinds of barriers. Other studies confirm the usefulness of preventive counselling by GPs [25,37,40].

The results of our study show that 65% of all patients felt themselves motivated by their GP. But counselling requires time, and time is money. This dilemma is well managed in the Netherlands [46], and at least reduced substantially by our three level strategy because of counselling and reinforcing at several levels and by different professions. However, during the 9 years of the Oestringen study, about 900 people shared various courses and actions of health education, two-thirds of them with long time adherence.

#### 4.1. Conclusion

In conclusion, the different motivations and barriers in men and women and psychosocial factors should be taken into account when developing future standards of patient education since there is no significant correlation between risk factors and motivation for health promotion. Although there was no recent change, two important risk factors (hypertension and smoking) could be reduced in our study, mainly due to the health climate and continuous advice in the general practices and at community (three level strategy of GP). The usual education encountered in health courses is more suitable for older adults with additional motivations than for younger individuals. The five A's counselling may be suitable especially for those 21% of study participants who were complaining about internal and external barriers to health-related activities and who need tailor-made interventions to motivate them for healthy activities.

#### 4.2. Practice implications

Brief structured advice, continuously repeated in the general practice, and easy access to stable local health courses seem to be the most effective (and probably efficient) approach for motivating patients towards a change in behaviour. Tailor-made preventive measures need evaluation and the co-operation of GPs at community level. The target groups 'younger people' and 'male smokers with low

education' should be addressed by pointing out the main motivations for health-promoting activities, namely fun and fitness.

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