



BACK CARE PROGRAMMES: THE LOW PARTICIPATION OF TARGET GROUPS AND UNCLEAR EFFECTIVENESS AS PRIMARY PREVENTION

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ABSTRACT

Purpose. Back care programmes (BCPs) for the prevention of back pain are widespread in Germany. They are intensively promoted and financed by health insurance organizations. The goal of the conducted research was to investigate whether BCPs adequately reach the targeted risk groups for primary and secondary prevention and whether the interventions employed are effective in reducing work disability and absenteeism due to back pain. **Basic procedures.** Absenteeism associated with back pain (ICD-10 codes M40-M54) and with participation in a BCP were evaluated based on data from 2004 through 2006 for a random sample of 9,781 persons insured with an mandatory health insurance organization. **Main findings.** 97% of all BCP participants in 2005 had not received a sick leave certificate due to back pain in the previous year. Furthermore, neither bivariate, nor risk-adjusted logistic regression models demonstrated a significant relationship with BCP participation and the subsequent risk of back pain. **Conclusions.** Current BCPs show low participation of target groups. The effectiveness in primary prevention of new cases is unclear.

Key words: low back pain, patient compliance, health promotion, programme effectiveness, back school, back care programmes

Introduction

There is little doubt that low back pain (LBP) is the most serious form of pain experienced in Western industrialized nations [1–4]. In the U.S., LBP results in an estimated 149 million lost work days annually and chronic LBP is associated with productivity losses of approximately \$28 billion each year [5]. Furthermore, depending on the health system, the indirect costs associated with LBP can be four to ten times higher than direct costs [5, 6]. In Germany, LBP is responsible for direct and indirect annual costs estimated at 54 billion euros, or 2.5% of Germany's GNP [7].

LBP is not a clinical diagnosis, but rather a symptom, with different stages of impairment, disability and chronicity [8, 9]. Furthermore, there are a variety of causes of LBP, with varying therapeutic options. For example, the recommended primary prevention measures differ from those used as secondary prevention measures in connection with specific causes (e.g. vertebral fractures,

infections, tumours, inflammatory diseases, disc herniations, or spinal stenosis) or arising from non-specific causes. It should be noted that LBP caused by non-specific causes constitutes 85% of all cases [6, 8, 10].

As a result of the diversity in LBP symptomatology and causality, an often confusing spectrum of LBP primary and secondary prevention options has evolved in many countries. The variation in LBP prevention approaches is also reflected in the number of back care programmes (BCPs) available. BCPs are common in Europe, USA, Canada and Australia, and typically involve seminars where factors such as posture, lifting techniques, exercises and back care during leisure and work activities are addressed. In general, however, BCPs offer prevention advice that is not backed by a uniform curriculum, standard evidence-based elements or professional supervision. In addition to these problems, participants usually choose their own BCP without professional medical advice. In Germany, mandatory statutory health insurance organizations are responsible for a large majority of both the direct and indirect costs associated with LBP, including disability payments. Currently, BCPs are a common form of primary and secondary prevention taken to minimise the incidence and prevalence of LBP among enrollees.

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Previous studies have found limited effectiveness associated with BCP participation [6, 10, 11]. Nevertheless, BCPs continue to proliferate. Given the costs associated with BCPs and their questionable effectiveness in reducing the risk of LBP, greater knowledge linking participation patterns and their outcomes is needed. Such an analysis would be helpful to potentially better align current BCPs, as well as for those in the field of LBP prevention in nations where BCPs are not currently put into practice, but where future implementation is considered.

In our study, three areas related to the participation and the outcomes associated with BCPs were investigated: (a) the incidence and prevalence of back pain among German employees from the service sector and the length of time, on average, that employees were unable to work because of problems with their spine or back; (b) the participation rate in BCPs, specifically among those at highest risk for recurrent back pain; and (c) the effectiveness of BCPs in preventing future periods of absence from work due to back pain. In general, German health insurance organizations have not released any statistics of BCP participation rates and outcomes. Our study, therefore, provides a unique insight into these BCPs and their current role in back pain prevention in Germany.

Material and methods

In Germany, nine out of ten employees are insured through mandatory health insurance organizations [12]. This study is based on data obtained from one of these organizations, insuring approximately 200,000 people at the time of this data assessment. Enrolment is open to all employees within Germany, but consists mainly of employees from the service sector.

Data, aggregated by year, was obtained from January 2004 to December 2006. A longitudinal study design was used to investigate the relationship between prior work disability due to back pain in 2004 and participation in a BCP in 2005 and the association of participation in a BCP in 2005 with recurrent and new episodes of back pain in 2006. To be included in the study, subjects had to (a) be continuously employed, either part-time or full-time, from 2002 to 2006; (b) be between the ages of 18 and 59 years old, as of January 1st, 2005; and (c) have complete data on work disability claims for the years 2004 and 2006. Individuals who participated in a BCP during the period from January 2002 to December 2004 were excluded from the study to eliminate any confusion in case of any previous participation in a BCP. A random sample of 9,781 persons meeting these criteria

was selected from the total insured population. Within the sample, 51.1% of the subjects were male, 48.9% were female and the mean age was 39.64 years (± 10.11).

The main dependent variable was absence from work due to disability claims in 2006 attributed to problems with the spine or back under ICD-10 codes M40-M54. In Germany, employees must obtain a sick leave certificate and doctors must report to the health insurance organizations the certificates they have given, categorized according to ICD-10 codes. For each subject included in the study, the number of sick leave certificates received, and the total number of days absent from work due to back pain-related disability, were assessed for the year 2006.

The number of sick leave certificates received and the total number of days absent from work due to back pain claims under ICD-10 M40-M54 for each subject was investigated for 2004. The participation of subjects in BCPs held in 2005 was also assessed. The BCPs in which the subjects participated included a range of courses, with titles such as "Spine Gymnastics", "Back School", "Back Training" and "Back Fitness". Participation in these programmes was reimbursed by the health insurance organization which provided the data for this analysis. The programmes were typically offered through sports/health clubs, night schools, local health departments, self-help groups, private institutions or other health insurance organizations. The participation in stress prevention and stress reduction courses (e.g. "Relaxation Techniques", "Progressive Muscle Relaxation" and "Autogenic Training") was also measured to investigate their relationship with subsequent work disability claims due to back pain separately.

Descriptive statistics were first calculated on the 2006 data, including calculation of the prevalence, frequency and duration of work absences due to back pain-related disability. Next, two cohorts were created according to the methods of Beaglehole et al. [13]. Cohort 1 consisted of subjects who had not missed work in 2004 due to a back pain disability claim ($n = 9,493$). Cohort 2 included those subjects who had submitted at least one back pain-related work absence certificate from their doctor in 2004 ($n = 288$). For both cohorts, participation in a BCP in 2005 and work absences in 2006 due to back pain-related disability were assessed. Finally, bivariate and multivariate logistic regression analysis was carried out. In the multivariate models, the receipt of a back pain-related work absence certificate in 2006 was the dependent variable and participation in a BCP in 2005 was the independent variable, adjusted for age and gender. The study complies with the principles of the Declaration of Helsinki. As we used anonymised

secondary data no ethical approval was required. All statistical tests were performed with the SPSS for Windows 18.0 package, with a significance level set at $p < 0.05$.

Results

In 2006, 3.2% ($n = 310$) of all subjects included in the study had submitted at least one certificate for work absence due to a disorder of their back or spine. In the large majority of cases (87%), only one back pain-related disability claim was made. Thirty-one subjects (10%) submitted two certificates and ten (3%) submitted three or more. Among subjects with a work absence due to back pain, 36.1% were unable to work for a period of one to five days. The median annual number of days absent was 14 days for subjects with a back pain-related disability claim in 2006, ranging from one to 365 days. As observed in previous studies [14, 15], women within the study, as well as older workers, were at greater risk of being absent from work due to back pain (Tab. 1).

Absence from work was asymmetrically distributed (Fig. 1). Three quarters of those who submitted back pain certificates in 2006 were responsible for only 2,732 days of absence (1st to 3rd quartile; Fig. 1). The remaining 25% of those with back pain claims had a total of 10,816 days of absence from work, or 80% of all days of absence from work were attributable to back pain claims.

Of the subjects who did not have a back pain-related claim in 2004 (Cohort 1), 1.7% (159 out of 9,493) par-

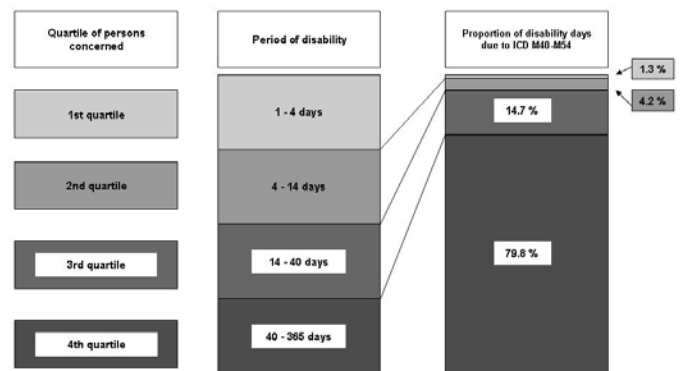


Figure 1. Distribution of approved absences from work of all individuals with sick leave certificates under ICD-10 M40-M54

ticipated in a BCP in 2005 (Fig. 2). Participation in BCPs in 2005, among subjects with a back pain-related claim in 2004 (Cohort 2), was even lower (4 out of 288, or 1.4%). Only 1% of subjects in Cohort 1, and 2% of subjects in Cohort 2, participated in stress reduction programmes in 2005 (results not shown).

For subjects in Cohort 1, there was no bivariate association, nor a significant relationship within the risk-adjusted regression models, found between participation in a BCP in 2005 and the subsequent risk for back pain in 2006 (Tab. 1). The same result was also observed for participation in stress reduction programmes. Due to the small number of BCP participants in Cohort 2, an analogous analysis of the effect of participation in a BCP on secondary prevention of back pain was not performed.

Table 1. Association of participation in a BCP in 2005 with recurrent and new episodes of back pain in 2006 for individuals without an approved absence from work due to back pain in 2004 (t_0) (crude and adjusted for gender and age)

	Model 1 Crude		Model 2 Adjusted for Gender and Age	
	Relative Risk RR	Odds Ratio OR [CI]	Relative Risk RR	Odds Ratio OR [CI]
First Participation in a Back Care Program in 2005	1,81	1,856 [0,902 – 3,820]	1,81	1,688 [0,818 – 3,485]
Gender: female ^a	–	–	1,22	1,431** [1,115 – 1,838]
Age in years	–	–	–	1,039*** [1,025 – 1,052]
Intercept ^b		–3.556		–3.543
r^2 adjusted ^c		0.001		0.019
n		9493		9493

Dependent variable: Disability days in 2006 due to ICD M40-M54 = 1; *** $p < 0.001$, ** $p < 0.01$

^a Reference category: male

^b Regression coefficient b

^c According to Nagelkerke

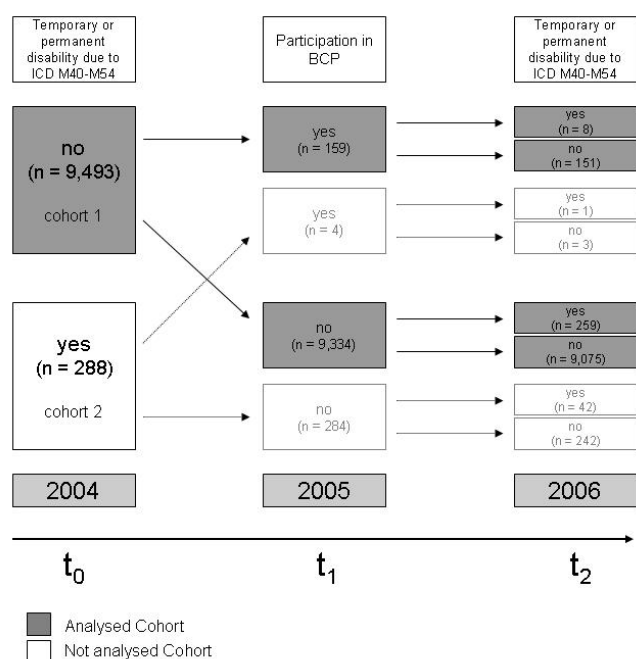


Figure 2. Flow-chart of study design to investigate rates of participation in BCPs and effectiveness of BCP for individuals with and without prior back pain-related work absence

Discussion

In Germany, a variety of BCPs are offered by the mandatory health insurance organisations, but the programmes are not standardised, nor evaluated or validated. Participation in such courses generally occurs without any professional medical advice and without recommendation for specific target groups. Based on the data provided by one such organization, our study found that the majority of BCP participants (97%) enrol as a primary prevention strategy, with no prior back pain claim. However, no significant association was found between participation in a BCP and the subsequent risk of back pain.

The strength of our study lies in its unique insight into insurance data, its longitudinal design and its sample size. To date, participation in BCPs in Germany has only been investigated within cross-sectional studies. As with our study, women and older workers were found to be at greatest risk of back pain, but prevention programmes were found to be more often utilized by persons with the lowest risk of pain [14, 16, 17]. Our longitudinal study design further permitted the investigation of the outcomes associated with BCP participation separately among persons with and without prior episodes of back pain. In addition, unlike many previous studies of the effectiveness of BCPs [18], we employed a standardized

assessment of back pain based on doctor-approved certificates for work absence due to a back pain disability according to ICD-10 codes. Typical sources of bias (e.g. social desirability bias, memory and interview bias; [19]) associated with self-reported assessment of back pain disability were thereby minimized.

However, the sample investigated consisted exclusively of insured persons working within Germany's service sector. This is a result of the specific client structure with the health insurance organization providing the data for analysis. On one hand, this limits the external validity of our results and our ability to generalize the study findings to other employee groups, such as blue-collar workers. On the other hand, internal validity is enhanced because of the homogeneity of our sample.

Furthermore, due to restrictions in accessing data, we did not have information on BCP course participation in 2004 and 2006, nor data of the approved absences from work in 2005. Therefore, it might be possible that persons without back pain in 2004 were absent because of back pain at the beginning of 2005 and subsequently participated in a BCP in midyear of 2005. However, based on our data, among those identified as free of back pain in 2004, less than 290 people should have been absent in the following year due to back pain, and less than 5 subjects from this subgroup would have participated in a BCP. Therefore, the impact of subjects without back pain in 2004, absent due to back pain at the beginning of 2005, participating in BCPs in 2005, should be limited. Nevertheless, we cannot explicitly measure the occurrence of this, or similar, scenarios within our dataset. These methodological limitations must be considered in the interpretation of our results.

Another limitation arises from possible bias from the under-reporting of subjects' participation in BCPs. The health insurance organization that provided the data for analysis reimburses BCP fees up to 500 euros per year. Although insured persons are broadly informed about BCP coverage through various sources (e.g. brochures, hotlines, the Internet), it should be assumed that not every covered BCP participant requested reimbursement. This reporting bias, however, should have equally affected both cohorts (i.e. those with no prior back pain claims and those with prior back pain claims).

Relation to other studies and explanations

The low participation of target groups: Our results on BCP participation are in line with studies on participation in other health promotion programmes [20–25]. For example, participation in health-related awareness

campaigns (e.g. smoking prevention and weight reduction) often show a phenomenon that is termed “preaching to the converted” [22, 26]. Awareness campaigns and health promotion programmes are mainly attended by individuals who already demonstrate a healthy and risk free lifestyle. Marstedt et al. [27] describe the typical participant at training and health programmes as sports-loving, more attractive than average, and youth-oriented. This dominant subgroup of individuals may create a competitive atmosphere and barrier to participation for persons at higher risk. Fear of increased pain or shying away from social contacts or competitive situations might also be expected of individuals suffering from chronic pain and could serve as a further explanation for the observed, low participation rates of target groups. Clearly, participation in LBP prevention programmes is not driven only by an individual’s objective evaluation of their burden of disease or risk assessment. The decision to participate is also influenced by numerous other factors that are not related to LBP’s current or future symptoms [28]. Therefore, the widespread BCP mottos in Germany to “train one’s back” are also more likely to attract those with the lowest risk of future back pain [24].

Furthermore, those who would profit most from participation in BCPs are unfortunately the ones more likely not to attend: individuals of lower social status, manual labourers, shift workers and those with irregular working hours [25]. People in these subgroups may face additional, information and health education-related barriers to participation. Specifically, to be able to seek out BCPs through one’s own initiative requires sufficient background information. Individuals at higher risk of suffering from back pain often do not have regular access to the Internet or print media, where information about BCPs is most readily available. Additionally, an intellectual understanding of and confidence in the effectiveness of such programmes is a prerequisite for voluntary participation in such courses.

Finally, structural barriers may, in part, explain the observed low participation rates of target groups. This is especially true in rural areas, where adequate financial means to pay for a car or public transport often determines whether sufferers can reach seminar venues. To compound these access issues, BCPs are often held during the day, usually during the morning or early afternoon. As a result, the participation of individuals at risk who must work during these hours is further limited.

Unclear Effectiveness: The non significant effect of BCPs (Tab. 1) could be attributed, in part, to the low participation of at-risk target groups. Only weak evidence has been found to support the effectiveness of BCPs for

random participants. In addition, sufficient evidence of the long-term effects is clearly lacking [3, 10, 29].

Furthermore, mandatory health insurance organisations finance a conglomeration of courses under the name “BCP”. These courses consist of a wide variety of activities and exercises, most of which are neither standardised nor evaluated. It is well known that numerous, highly complex bio-psycho-social aspects must be taken into consideration when dealing with the aetiology of LBP [15, 30]. This demonstrates, that with a clear definition of target groups, that specialised BCP selection and participation thanks to individualized medical advice can be as strongly recommended on our part as the implementation of standardised elements and course curriculums.

Conclusions

Those involved in LBP prevention program planning and health care politics, both in Germany and in other nations, can learn from the results presented here. One of the most important lessons to be learnt is that the current approach to BCPs result in low participation in secondary prevention and have unclear effects for primary prevention. More importantly, our findings support Meschnig’s thesis [31] that health promotion activities in their current form add to social injustice and fail to meet the central aim of prevention politics in “reducing existing inequalities in exposure to risks” [15, 32, 33].

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