Danish heart patients' participation in and experience with rehabilitation
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What is This?
Background

Cardiovascular disease (CVD) is the primary cause of hospitalisations in Denmark. In 2005 CVD caused 86,336 patients to be hospitalised in a total of 142,245 days. Hospitalisation rates differ substantially with respect to gender and socioeconomic characteristics. More men than women are hospitalised with CVD and the risk of hospitalisation due to CVD increases with higher age, lower education, and/or income. Ischaemic heart disease (IHD) leads to the most hospitalisations [1].

The Danish Heart Foundation (DHF) recommends that all patients hospitalised with CVD receive an individual assessment of the need for rehabilitation. Those in need of rehabilitation should be given access to cardiac rehabilitation (CR) [2].

CR aims to: (a) identify susceptible risk factors like smoking, diet, physical activity, blood pressure, (b) teach and motivate the patient to healthy living, and (c) maintain and, if possible, improve the patient’s physical, psychosocial, and work-related functioning [2]. Hence, a complete CR programme should include medical/physical, social, and psychological components. International studies show that CR improves individual quality of life and reduces health costs by lowering risk of complications, readmission, or invasive therapy [2,3]. Danish studies support that CR is cost effective [2,3].

There is little or no systematic knowledge about to what extent IHD patients actually participate in CR programmes and how they experience their participation in a rehabilitation programme. Thus this study aims to investigate Danish IHD patients’ participation in and experience with CR programmes. The study investigates how many Danish IHD patients participate in a complete CR programme and whether or not this participation is affected by...
factors such as gender, age, and socioeconomic status. Finally, the study also investigates determinants of patients’ satisfaction with CR.

**Materials and methods**

**Sample and data**

The study population is 15,033 patients diagnosed and hospitalised with ischaemic heart disease (DI20–DI25) in the period from 1 July 2007 to 31 January 2008 identified in the National Patient Registry (NPR). A total of 8002 patients was sampled proportionally to the total population in each municipality and a questionnaire was sent to them (formally by DHF) in September 2008, along with a definition of rehabilitation. One week before deadline, a reminder was sent to the 5673 patients who had not yet returned the questionnaire. A total of 356 patients contacted DHF to inform that they had not returned the questionnaire for various reasons. Of these, 231 had not been hospitalised. DHF were able to note the identification number for 182 of these patients and they were excluded from the sample, which was then reduced to 7820 patients.

Table I shows the basic information on the population in the study.

**Categorisation**

In the questionnaire, the patient was asked to answer whether or not he or she participated in the following specific elements of CR: advice on healthy diet, physical activity, check up of medical treatment, education in understanding the disease (IHD), or psychological support to the patient or his/her relatives. Based on these specific questions in the survey, four categories with increasing levels of CR were formed. The categories were, in collaboration with DHF, defined as:

- “very limited rehabilitation”, consisting of patients who only received check up of medical treatment and/or advice on healthy diet;
- “partial rehabilitation”, consisting of patients who received “very limited rehabilitation” and at least one other element of rehabilitation;
- “complete rehabilitation”, consisting of patients who received all the specific elements of rehabilitation: check up of medical treatment and advice on healthy diet and education in understanding the disease (IHD) and psychological support of the patient and psychological support of their relatives’
- “non-participation”, consisting of patients who in two different questions have indicated that they did not participate in rehabilitation at all.

The categories for levels of rehabilitation were mainly created to provide more statistical power in the analyses (from nominal to ordinal scale levels). They do not represent official standards of levels of rehabilitation, but the level of “complete rehabilitation”, however, is in line with the recommendations for optimal rehabilitation.

A categorical variable was formed to indicate whether or not the patients experienced good satisfaction with CR.
rehabilitation. The variable “good rehabilitation” consists of patients who partly or fully agreed with the following statements: (a) “my rehabilitation has been well planned”, (b) “I always knew who to address in relation to my rehabilitation”, and (c) “due to my rehabilitation I have regained an every day life with the same quality as before my heart disease”.

A variable called “psychosocial rehabilitation” was formed to investigate how many patients receive either psychological support themselves or education in understanding the disease and at the same time answer yes to at least one of the answer categories in the question: “Have you participated in rehabilitation after your discharge from the hospital?”

Statistical analysis

The patients’ participation in and experience with cardiac rehabilitation were analysed descriptively by frequency tables and cross tabulations using the Chi-squared test to identify significant variations/associations between two variables. Selected findings from the tabulations stratified by age and gender were further analysed using logistic regressions that, in addition to age and gender, included several socio-economic covariates. All statistical analyses were conducted using the statistical package Stata v.10.

Results

A total of 4371 returned the questionnaire, equal to 56% of the final sample.

Respondents and non-respondents

The proportion of respondents was 56% of the final sample (4371 respondents from a sample of 7820 patients). From NPR we had information about the age, sex, code of diagnose, size of municipality they live in, which region they live in, and at which hospital they had been hospitalised. Proportions of respondents and non-respondents were compared within each group and Pearson’s Chi-squared tests for deviation from mean where performed (not shown).

The tests did not reject that there were some differences between the respondents and non-respondents. The proportion of respondents increased with age groups, and men had a higher proportion of respondents than women. Also, patients from the capital and north regions had a significantly lower proportion of respondents compared to the other three regions. And finally, patients with a recently occurred ischaemic heart disease had a higher proportion of respondents than patients with stable ischaemic heart disease. Although there were statistically significant differences between respondents and non-respondents, these were numerically small and we decided not to adjust by weighted analysis.

It turned out that the sample drawn from the Danish NPR actually included 35% patients who in their last contact had not been inpatients but outpatients. We maintained the full sample, however, because we found no difference at all with or without the outpatients in rehabilitation participation [4].

Participation in rehabilitation

Table II shows that less than 3% of the patients received “complete rehabilitation”, 47% received “partial rehabilitation”, 32% participated in “very limited rehabilitation”, while 19% of the patients did not participate in any rehabilitation. More men (83%) than women (76%) reported some participation in rehabilitation \((p<0.01)\). Participation in four age groups (see Table I) varied unsystematically and non-significantly from 80% to 83%.

Table II also shows that the proportion of patients who participated in each level of rehabilitation was higher for men than women (not significant). Multinominal logistic regression with the four levels of rehabilitation (“none”, “very limited”, “partial”, and “complete”) as outcome variables was performed.
Heart patients’ participation in rehabilitation

(not shown) to investigate simultaneous systematic differences with respect to education level, region of residence, age, gender, code of diagnosis, and cohabitant status. They revealed no statistically significant results.

Table III shows that the low proportion of patients participating in “complete rehabilitation” was primarily due to the very limited numbers of patients participating in psychosocial rehabilitation. Ten per cent of the patients participated in individual psychological support while 6% received psychological support of their relatives.

**Variations in patients’ participation in rehabilitation**

Table IV shows that there are statistically significant differences between patients in different age groups and men vs. women, when it comes to the proportion of patients who received diet advice: 53% of the patients between 50−59 years received diet advice while 37% of the patients below 50 years received diet advice. Also more men (53%) than women (43%) received diet advice. Relatives to patients without vocational education, as well as the patient themselves, more often receive psychological support than patients with some kind of vocational education. Patients living together with a partner/spouse are more likely to participate in education in understanding the disease, to participate in psychosocial rehabilitation, and to receive advice on healthy diet.

**Characteristics of patients who experience good rehabilitation**

To experience good rehabilitation is to agree in the statements that the rehabilitation has been well planned, that the patient always knew where to go and whom to address in relation to their rehabilitation and that the patient through the rehabilitation programme has regained an everyday life with the same quality as before the heart disease occurred.

Both female and male patients have a higher probability of experiencing a good rehabilitation programme, if they felt secure when discharged from the hospital and if they participated in psychosocial elements of rehabilitation. In the case of female patients, the probability of experiencing good rehabilitation is lower when the patient is over 70 years old and/or is out of the labour force.

<table>
<thead>
<tr>
<th>Rehabilitation element</th>
<th>Participation (%)</th>
<th>No participation (%)</th>
<th>Total (n)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Check up of medical treatment</td>
<td>64</td>
<td>2</td>
<td>4042</td>
</tr>
<tr>
<td>Advice on smoking cessation</td>
<td>9</td>
<td>9</td>
<td>3970</td>
</tr>
<tr>
<td>Advice on diet</td>
<td>46</td>
<td>8</td>
<td>3993</td>
</tr>
<tr>
<td>Psychological support to patient</td>
<td>10</td>
<td>7</td>
<td>3929</td>
</tr>
<tr>
<td>Psychological support to relatives</td>
<td>6</td>
<td>6</td>
<td>3912</td>
</tr>
<tr>
<td>Education in understanding the disease</td>
<td>19</td>
<td>5</td>
<td>3924</td>
</tr>
</tbody>
</table>

Unanswered elements and wrongly completed answers are not included.

Table IV. **Characteristics of patients with a higher probability of participating in specific elements of rehabilitation.**

<table>
<thead>
<tr>
<th>Rehabilitation element</th>
<th>Higher probability of participation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Check up of medical treatment</td>
<td>No vocational education</td>
</tr>
<tr>
<td></td>
<td>Not at disposal for the labour market</td>
</tr>
<tr>
<td></td>
<td>Age: the higher age, the more receive check up of medical treatment</td>
</tr>
<tr>
<td>Advice on healthy diet for heart patients</td>
<td>Age: 50−59 years</td>
</tr>
<tr>
<td></td>
<td>Cohabitation/married</td>
</tr>
<tr>
<td></td>
<td>Men</td>
</tr>
<tr>
<td>Psychological support of the patient</td>
<td>No vocational education</td>
</tr>
<tr>
<td>Psychological support of the relatives</td>
<td>No vocational education</td>
</tr>
<tr>
<td></td>
<td>Men who have been hospitalised in a small hospital</td>
</tr>
<tr>
<td>Education in understanding the disease</td>
<td>Cohabitation/married</td>
</tr>
<tr>
<td></td>
<td>Men living in a big municipality</td>
</tr>
<tr>
<td></td>
<td>Men hospitalised in a small hospital</td>
</tr>
<tr>
<td></td>
<td>Women hospitalised at a private hospital</td>
</tr>
</tbody>
</table>

Results are based on cross-tabulations using the Chi-squared test. Only statistically significant results are reported.
How many and who are satisfied with their rehabilitation?

Among the patients who participated in rehabilitation, at any level, 52.5% were satisfied with the event, while 10% were dissatisfied. Fewer women (46%) than men (55%) reported being satisfied with their rehabilitation. A lower proportion of the younger respondents (<50 years) than older respondents (≥50 years) were satisfied.

The association between respondents reporting being satisfied with rehabilitation or not and their characteristics was investigated using a logistic regression. Covariates included level of education, labour force status (in/out), region of residence, age, gender, type of diagnosis, cohabitant status, and participation in any type of psychosocial rehabilitation. The regression results are reported in Table V and confirm that female patients are less satisfied with their rehabilitation. Table V also shows that respondents who were out of the labour force at the time of hospitalisation are more likely to be satisfied with their rehabilitation. Respondents who received psychosocial rehabilitation are much more likely to be satisfied with rehabilitation than patients who did not participate in psychosocial rehabilitation.

Discussion

This study shows that very few IHD patients (3% of respondents) participate in a “complete rehabilitation” programme. A considerably larger proportion of patients participated in a “partial” or a “very limited rehabilitation” programme (47 and 32%, respectively). A weakness in the study is that we do not have detailed information about the extent of each specific rehabilitation element. Thus, a complete cardiac rehabilitation programme can differ from patient to patient regarding, for example, how much and for how long the specific elements are managed in the programme. These possible differences affect the overall effects of cardiac rehabilitation and the patients’ satisfaction level.

The very low proportion of patients who received a complete CR programme is primarily due to the fact that relatively few patients were offered and chose to participate in psychosocial elements of rehabilitation. These elements appear not (yet) to be a fully integrated part of CR programmes in Denmark. This is unfortunate since the study also shows that patients participating in psychosocial elements were more satisfied with their rehabilitation, that they felt more secure about returning home from hospital, and are more likely to report having a good experience with their rehabilitation.

The potential of psychosocial rehabilitation furthermore is supported by previous research. Patients with cardiovascular disease suffering from depression have twice the mortality risk compared with patients not suffering from depression \[4,5\]. Likewise, patients with depression symptoms are estimated to have 1.3–6.6 times the odds of suffering from recurring acute coronary disease \[5,6\], and patients suffering from anxiety have 6-times the odds of mortality than other patients with cardiovascular disease \[6\]. Depression and post-traumatic
stress syndrome occurs for 20−30% of all Danish patients with acute coronary disease [7]. Moreover, patients suffering from depression have lower medicine compliance, and change in lifestyle, e.g. smoking cessation, more exercise, and healthier diet, are more difficult to implement when the patient is suffering from depression [5].

At present there is no solid evidence that psychosocial interventions reduce cardiovascular mortality [7]. Even so, several indicators point to possible benefits from including psychosocial factors with respect to diagnose and treating anxiety and depression among patients with cardiovascular disease. There are also indications that it is sensible to provide resources to give the best possible social support, and to use information on socioeconomic status and psychosocial risk factors when assessing the individual patient’s need for psychosocial rehabilitation [7].

This study shows that IHD patients’ relatives rarely are involved in the rehabilitation programme. Only one-third of the patients participating in rehabilitation reported that their relatives were involved in some way. This result is in line with previous Danish research that pointed to the need for more involvement of relatives [8,9]. Relatives to heart patients have a significant influence on the outcome of rehabilitation. The relatives are often exposed to psychic reactions from the patient that is important to manage in order to provide better support [8,9].

The providers of health services are faced with a challenge in organising and offering rehabilitation programmes targeted female IHD patients. There is a need to increase female patients’ participation in and satisfaction with rehabilitation. The responses from female IHD patients differed from male patients in practically every respect. They were less likely to participate in the different elements of rehabilitation, less satisfied with their rehabilitation programme, felt less secure about returning home from the hospital, and were less likely to experience good rehabilitation. Other studies also find gender differences in CR. In a study of predictors of cardiac rehabilitation in older coronary patients, only 15% of women entitled to enter a rehabilitation programme compared with 25% of men. Although men and women had similar severity of disease, physicians were less likely to recommend cardiac rehabilitation to women [10]. A study finds that women are more limited from participating than men because of factors such as transportation problems and more comorbid conditions and were more likely to have a dependent spouse at home [11]. Another study shows that fewer women than men complete rehabilitation programmes. The study concludes that if we want higher participation rates among women, then the CR programmes must be structured to meet the unique needs of women [12]. We need more knowledge about female IHD patients’ needs and behaviour in relation to rehabilitation. A qualitative study of women’s perceptions of CR concludes that we need more research into how health professionals should assess the education and needs of women [13].

Generally, there is a need for targeting CR at different IHD patient segments, e.g. male and female patients, younger or older patients, and patients with or without a job. Further research on how to assess and target the patients’ individual needs are necessary, as it seems that “one size does not fit all”.

In this study, 19% of the respondents did not participate in any level of rehabilitation. The high proportion can have numerous explanations. However, this survey does not readily provide the answers to why some patients have either not been offered rehabilitation or chosen not to participate. A systematic review of reasons for poor participation in CR shows a broad and extensive range of barriers which prevent patients from participating. Thus the review suggests that health providers need to develop models for CR that are, for example, are responsive to the needs of the patients and are delivered in a variety of settings and modes [14].

Conclusions

This study showed that only 3% of hospitalised cardiac patients participate in a complete rehabilitation programme mainly due to psychological support not being supplied to or accepted by the patients. Ten per cent of the patients participated in psychological support and 6% received psychological support to their relatives. The study found gender differences in IHD patients’ participation in and experience with CR. Male patients are more satisfied with their rehabilitation than female patients. Some age differences were also found. IHD patients under 60 years are less satisfied and feel less secure about returning home from hospital than the patients older than 60 years. Patients participating in psychosocial elements are more satisfied with their rehabilitation and feel more secure about returning home from hospital.

Acknowledgements

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Funding

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