

Non-attendance and drop-out in cardiac rehabilitation among patients with ischaemic heart disease

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ABSTRACT

INTRODUCTION: Previous studies have shown drop-out from cardiac rehabilitation (CR) to have prognostic influence on morbidity and mortality among patients with ischaemic heart disease (IHD). We aimed to identify and clarify patients' reasons for non-attendance and drop-out from CR.

MATERIAL AND METHODS: A total of 872 consecutive patients with acute myocardial infarction and/or after percutaneous coronary intervention or coronary artery bypass surgery were asked by conventional mail to fill in a self-completion questionnaire on their choice of post-hospital CR and their reasons for drop-out or for non-attendance.

RESULTS: Age, employment and marital status had a statistically significant influence on the overall course of CR. Younger age, affiliation with the labour market and living alone were related to a higher drop-out from CR in univariate analysis. We found no evidence of a gender difference among the patients who withdrew. Lack of time was stated as the prevailing reason for non-attendance and withdrawal from CR programmes among employed patients and in people aged 65 years or younger. Patients above 75 years of age asked for additional differentiation of exercise levels; currently two levels are offered. Or they found CR meaningless given their physical condition or their overall life situation.

CONCLUSION: In patients with IHD, age, marital status and employment status play a role in the patient's attendance or drop out from CR. Different physical conditions, lack of time, too great a distance from residence to hospital, transport problems and lack of understanding of the benefits of CR explain why patients refuse to participate in or drop out from CR.

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The benefits of cardiac rehabilitation (CR) have been demonstrated in a number of meta-analyses [1, 2], and national strategies in line with the current study consider that CR is a part of the active treatment of patients with cardiovascular diseases [3, 4]. The Danish Institute for Health Services Research and the Danish Heart Association made a nationwide survey in 2010, which showed that only 13% of Danish cardiac patients have completed CR programmes. In total, only 36% of patients had par-

ticipated partially or had completed CR programmes [5]. Similar results were recorded in most European countries where the proportion of patients participating in post-hospital rehabilitation was below 50% [6].

Drop-out from CR has a prognostic significance for morbidity and mortality in patients with ischaemic heart disease (IHD) and was analysed in several studies aiming to elucidate the parameters associated with patient's choice and compliance [7-10].

Further research into patients' needs, preferences and wishes for rehabilitation will allow us to optimise CR and to make it more effective. Thus, the aim of this research was to identify and clarify patients' reasons for non-attendance and drop-out from CR.

MATERIAL AND METHODS

Study population

In 2009 (412 patients) and in 2011 (460 patients), consecutive eligible patients admitted to the Department of Cardiology, Southwest Jutland Hospital, Esbjerg, Denmark with acute myocardial infarction and/or after percutaneous coronary intervention or coronary artery bypass surgery were contacted by surface mail one year after hospital discharge with a self-completion questionnaire on their choice of and completion of CR programme in the post-hospital stage or their drop-out or non-attendance. In addition, they were invited to provide the reasons for their drop-out and non-attendance. This article is based on 682 answers from the respondents: 352 answers in 2010 and 330 in 2012. The response rate was 78%.

Cardiac rehabilitation programme

The CR programme consists of three elements: clinical consultations, educational workshops and a physical exercises programme.

Clinical consultations (CC) are based on three consultation visits: At the first visit within 2-3 weeks after being discharged from hospital, patients are offered counselling by a dietician, a nurse screens for depression and assesses coping behaviour, and, finally, a cardiologist performs a physical examination and follows up on risk factors and medical treatment. The second CC is held with a specialised nurse three months later. This CC again focuses on risk factor control, compliance with

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TABLE 1

Patient characteristics and choice of cardiac rehabilitation in 2009 and 2011.

	2009 (n = 352)	2011 (n = 330)	p-value
Age, mean ± standard deviation, yrs	67.0 ± 11.1	67.5 ± 10.6	> 0.05
<i>Gender, %</i>			
Women	31.8	28.7	> 0.05
Men	68.2	71.3	> 0.05
<i>Labour market situation, %</i>			
Employed	23	25	> 0.05
Retired	61	55	> 0.05
Early retirement programme	4	5	> 0.05
Early retirement pension with disability	7	9	> 0.05
Other	5	6	> 0.05
<i>Family status</i>			
Living alone	23	25	> 0.05
Living with a partner	72	70	> 0.05
<i>Patients choice of cardiac rehabilitation, %</i>			
Entire offer	46	44	> 0.05
Clinical controls, patient education, physical exercise programme at the hospital only	— ^a	14	—
Clinical controls only	18	10	< 0.01
Clinical controls, physical exercise programme at the hospital and in the municipal centres	22	21	> 0.05
Clinical controls and patient education	6	8	> 0.05
Other	1	0	—
Complete refusal of all parts of the programme	6	2	< 0.01
Not invited	1	1	> 0.05

a) Not asked in 2009.

TABLE 2

Reasons for non-attendance and drop-out from cardiac rehabilitation among patients meeting the inclusion criteria in 2009 and 2011. The values are %.

	2009 (n = 352)	2011 (n = 330)
Unnecessary	5	10
Time problem	10	12
<i>Inadequate physical form</i>		
Too demanding	11	5
Too easy	11	5
Dissatisfaction with the programme	2	4
Transport problem	4	4
<i>Long distance from residence</i>		
To the hospital	7	5
To the municipality training centres	7	4
Other reasons	7	4

medical treatment, symptoms and coping behaviour. One year after the hospitalisation, the patient is invited to the final CC with the nurse and the doctor.

Educational workshops for patients and relatives are offered as three meetings held at two-week intervals, each lasting 90 minutes and focusing on IHD development, prevention and coping with a chronic illness.

The physical exercise programme is tailored to fit the patient's needs and physical condition, assessed by either a treadmill test or a six-minute walking test. For

the physical exercises, patients are allocated to one of two teams with different intensities, each of which are supervised by physiotherapists and a nurse. The programme consists of one hour of training twice a week for six weeks in hospital immediately followed by 2-8 weeks in the municipal centres, depending on the patients' needs. Before the second stage of the study in 2011, CR underwent some reorganisation and as a result patient stratification was introduced based on patient functions and self-care ability, co-morbidity and the disease complexity according to national Danish recommendations for patient rehabilitation programmes [11, 12]. A nurse coordinator was employed to serve as a contact for patients during CR.

Questionnaire

All 872 eligible patients were contacted by post with the questionnaire. Patients were asked about their choice of rehabilitation and whether they had completed the selected CR. In case of drop-out before the scheduled time, the patients were invited to specify at which stage they had dropped out. The patients were asked about reasons and causes for their drop-out or non-attendance to the entire CR or their partial attendance to the CR and were provided with several answer options that were considered as possible reasons for drop-out or non-attendance to the CR. The answer options provided were as follows: the offer was unnecessary, the offer did not fit my schedule or the offer did not fit my physical condition (in the 2011 survey, this option was made more precise with the wording: "too easy and too demanding"), dissatisfaction with CR, transportation issues, long distance to/from residence. The respondents were also provided with an option to indicate their own reasons for their drop-out or non-attendance from the CR, which were recorded as "Other reasons".

Statistical analysis

The results of the analysis are represented as absolute data and/or as percentages. Clinical variables were displayed as means and standard deviations. Qualitative variables for the choice, the drop-out from or non-attendance to the rehabilitation programme were compared using the χ^2 -test or the Fisher's exact test for small sample sizes with a significance level of $p < 0.05$. The statistical analysis was conducted using STATA 11 software.

Trial registration: not relevant.

RESULTS

Patient population

There was no significant difference in age, gender, labour market affiliation or family status among patients

in 2009 and 2011. **Table 1** summarises the patients' choice of CR.

Patient drop-out from cardiac rehabilitation

In all, 50% of the respondents indicated that they had completely implemented the chosen CR. The analysis of drop-out from CR showed physical exercises to have the highest discontinuation rate: 21% of all respondents in 2009. For 2011, the separate evaluation of the training in the hospital and subsequently in the municipal centres showed that 13% withdrew from the first stage of training in the hospital and an additional 22% from the last stage. A lower discontinuation rate was observed for patient education on IHD development (12% in 2009 and 8% in 2011), and the lowest discontinuation rate observed for the clinical controls (3% both in 2009 and 2011). There was no significant gender difference in the discontinuation rate for any part of the CR.

The analysis among patients with and without affiliation to the labour market, respectively, showed that working patients discontinue physical exercises more frequently than non-working patients. 24% of eligible working patients withdrew from training in 2009 versus 20% among patients with no labour market affiliation. This finding, however, was not statistically significant (ns). However, in a separate analysis of drop-out from physical exercises in the hospital and subsequently in the municipal centres in 2011, a significant drop-out from training in the municipal system was registered among patients with an affiliation to the labour market: 32% against 19% ($p = 0.01$).

Analysis of age differences showed that patients aged 50 or younger in the 2009 cohort had discontinued their clinical controls more frequently: 9% versus 2%, $p < 0.05$. In the 2011 cohort, patients aged 65 years and younger had a higher rate of drop-out incidences from patient education on IHD development: 12% versus 6% with $p < 0.05$. This age group also showed a higher prevalence in the number of drop-outs from physical exercises both in the hospital (18% versus 10% ($p < 0.05$)) and in the municipal system: 30% versus 17% ($p < 0.05$).

In addition, we analysed the group of patients who rejected the entire CR. The study in 2009 showed that the majority (78%) lived alone. Yet, despite this, the mean age, the male-female ratio and affiliation to the labour market were identical. In the second stage of the study performed in 2011 after introducing a coordinator who contacted non-participants, living alone was no longer an independent predictor for non-participation.

Reasons for non-attendance and drop-out from the rehabilitation programme

The cumulated analysis of the reasons for dropping out partially or completely from CR among all the enrolled

patients in both 2009 and 2011 shows that the most frequently stated reasons were time issues and inadequate physical training programmes given the patient's physical condition. In 2011, the latter reason was specified as too low intensity or too high intensity relative to the patient's level. In addition, 10% of respondents in 2011 found that the rehabilitation programme was unnecessary (**Table 2**). Other reasons that were identified and stated in the questionnaire are as follows: psychological problems, co-morbidity, return to the labour market and lack of a tailored physical rehabilitation programme, even though two levels were available.

In 2009, women rated the reason *long distance to place of residence* higher than men did (12% versus 5% in men, respectively, $p < 0.05$). Correspondingly, women rated transport problems higher than men did (6% and 2%, respectively, $p < 0.05$). However, this trend was not confirmed in 2011.

Female patients pointed out more frequently *inadequate physical condition* as a reason for non-attendance (14% against 10%, though without reaching statistical significance, $p > 0.05$) in the study in 2009. By defining the training level as being either too demanding or too easy in the second stage of the study in 2011, it was recorded that 8% of male patients rated the intensity of the physical exercise programme as too easy, versus 0% among women.

The analysis of patients with and without affiliation to the labour market has demonstrated that in both stages the prevailing contributing factor associated with non-adherence and drop-out from CR among working patients was lack of time (23% versus 6%, $p < 0.05$ in 2009 and 32% versus 5% in 2011, $p < 0.001$). Time issues were the crucial reason for patients in the younger age groups: 25% of the patients who were 50 years or younger and 12% of patients aged 51-65 years in the 2009 survey. Furthermore, in 2011, this reason was seen as the prevailing one among patients in the younger age groups: 23% of patients aged 50 and younger and 18% in the 51-65 years age group mentioned this as a reason. Patients in the group aged 76 years or above pointed to the inadequate training level compared with their own physical condition as the main cause of non-attendance and drop-out (16% in 2009 and 11% in 2011).

In our analysis, we also investigated patients with different marital statuses and established that patients who live alone demonstrate poor rates of adherence and see too long distance from their residence as the main obstacle (11% against 6% in 2009 and 11% against 3% in 2011, $p < 0.05$).

DISCUSSION

A total of 50% of our respondents maintained attendance in the chosen CR programme after their discharge

Physical exercises as part of cardiac rehabilitation had the highest discontinuation rate among patients with ischaemic heart disease.



from hospital. Our findings indicate that the majority of drop-outs occur in physical training, and that the lowest rates of adherence were observed in the last stage of the physical exercises programme in the community setting. The CC element of CR was associated with the lowest drop-out rate.

Age and employment were identified as having a statistically significant influence on the overall course of CR. Patients aged 65 years or younger tend to withdraw from clinical controls more and also to participate less in teaching aiming to improve their understanding of IHD development and in physical training. In agreement with previous retrospective studies, this research has established a correlation between young age and drop-out from CR [13, 14]. Working patients are more inclined to withdraw from the last stage of training in the municipality setting, probably because they return to work. Availability of home-based programmes could provide an opportunity to widen access to and participation in CR as demonstrated in the Birmingham Rehabilitation Uptake Maximisation study [15].

We found no evidence of a gender difference among the patients who withdrew during CR.

Our study has demonstrated that family status has a significant impact on a patient's participation in CR. In the previously published studies, it was seen that patients who live alone have a higher risk of dropping out from CR [16]. Indeed, this trend was obvious in the first stage of our study in 2009: persons living alone had the highest rate of rejecting the entire CR offer. However, this difference disappeared after the reorganisation of CR with patient risk stratification and direct active contact to non-attenders at outpatient controls.

A key to improving the participation in CR programmes lies in the identification of barriers to participation and adherence to rehabilitation programmes and their customisation to the patient's individual needs. As described in the analysis of patients' barriers and reasons for non-attendance and withdrawal from CR, time issues and perhaps a perception of inadequate training in terms of the patient's individual physical condition

were frequent reasons for non-participation in the analysis of all enrolled patients.

A significant difference was seen in the main reasons for non-attendance and withdrawal from CR among employed patients, patients from different age groups and patients with different family status. No gender differences were demonstrated. Lack of time was the prevailing reason for non-attendance and withdrawal from CR among employed patients and among patients aged 65 years or younger. This could, to some extent, be countered by offering CR outside normal working hours.

For the elderly patients aged 76 years or more, we recommend the introduction of an assessment of patient's physical condition and of the adequacy of the physical exercises as well as of any lack of understanding on the part of the patient of the benefits of CR. Furthermore, to improve participation in CR among patients with poor self-efficacy and those living alone, it is advisable to make the efforts of health-care staff more efficient and to maintain a more active contact with patients during CR.

CONCLUSION

Based on the results of the present study, it can be concluded that factors such as age, family status and employment play a crucial role for a successful CR process in patients with IHD. Factors such as young age, employment status and living without a partner affect the patient's decision to attend or withdraw from CR.

Time issues, lack of understanding of the benefits of rehabilitation, varying physical conditions, and distance or transport problems could be regarded as reasons for non-attendance or drop-out from CR. Reasons for non-attendance or dropout from rehabilitation programmes vary across to different patient groups and depend on the patient's age, employment and family relationships.

To ensure the best possible rehabilitation and to improve patients' participation in CR, the CR programmes should be customised to patients' needs of various patient groups in terms of their age, social and family status.

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