

Can patient satisfaction improve health among patients with angina pectoris?

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Abstract

Objective. To identify and explore the components of patient satisfaction that have the strongest association with health-related quality of life among patients with angina.

Design. Cross-sectional study with postal questionnaires sent to patients 6 weeks after discharge from hospital, followed-up by one reminder.

Setting. The Central Hospital of Akershus in Norway.

Study participants. All 589 angina patients discharged between January 1 1995 and December 31 1996. The response rate was 67% ($n=395$).

Main outcome measures. Physical and mental component summary scales in SF-36.

Results. When adjusted for relevant background factors such as age, sex, education, social network, health behaviour and sense of coherence, patient satisfaction explained 9% of the variation in the physical, and 7% of the variation in the mental component summary scales. In particular, satisfaction with medical treatment ($P=0.002$) and with information ($P=0.003$) were associated with improved physical and mental health-related quality of life. Patients who experienced their physicians as caring and competent were more likely to be satisfied with the medical treatment and with the information. Sense of coherence contributed to health-related quality of life both directly, and through improving patient satisfaction.

Conclusion. This cross-sectional study supports the hypothesis that patient satisfaction contributes to both physical and mental health-related quality of life. Other research designs are needed to assess whether the associations identified are truly causal.

Keywords: angina, patient satisfaction, quality of life, sense of coherence, SF-36

For patients with chronic disorders, such as angina, a primary goal of health care is to maximize function in everyday life and to achieve the highest possible level of well-being [1]. Of all patients admitted to Norwegian somatic hospitals 2.5% have angina as their main diagnosis, and it is the most common admitting diagnosis. Patients with angina are known to have considerable burdens related to both physical and mental health-related quality of life [1]. It would thus be of interest to know if and to what extent patients' experiences in the hospital influenced their health status after discharge.

Exploring associations between patient satisfaction and health-related quality of life is complex. There is not necessarily a unidirectional causal specification between patient satisfaction and clinical outcome. It is entirely possible for the relationship to be the reverse or even reciprocal [2].

Although associations between patient satisfaction and

clinical outcomes are incompletely explored [2], there are several known consequences of satisfied patients. Satisfied patients are more likely to continue using medical care services [3], to maintain a relationship with a specific provider [4–6], and to comply with medical regimens [7]. Satisfaction also increases patient involvement and participation in the treatment processes and their willingness to contribute with information essential for diagnoses and treatment [8].

It may seem obvious that there are associations between patient satisfaction and health-related quality of life. It is, however, not obvious which of the satisfaction components are of importance. Identifying these components would enable us to make more rational quality improvement strategies, and to contribute to increased effectiveness in hospitals. When exploring associations between patient satisfaction and health-related quality of life, it is desirable to adjust for other

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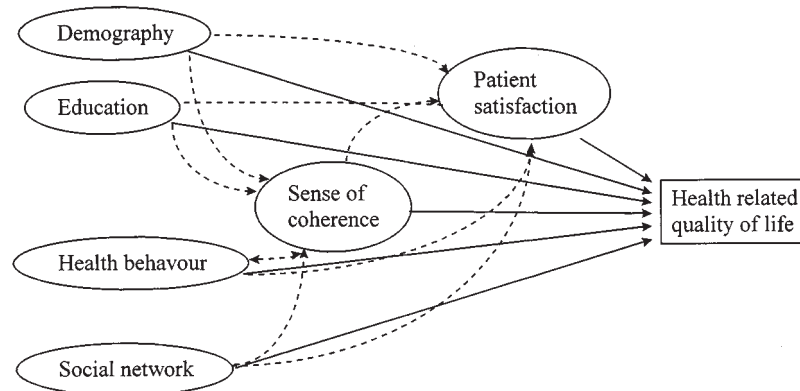


Figure 1 Simplified analytic model of relationships between various independent variables and health-related quality of life.

factors of known importance to health, e.g. demography [9], social status [10], smoking behaviour [11], social network [12], and patients' ability to resist stress [13].

This study was performed to identify the areas of patient satisfaction with the strongest associations to physical and mental health-related quality of life among patients with angina pectoris, and to explore the interactions between patient satisfaction and various other factors of relevance to health.

Methods

Between January 1 1995 and December 31 1996 postal questionnaires were sent to all 589 patients discharged from The Central Hospital of Akershus with angina pectoris (ICD-9 413) 6 weeks after hospital discharge; this was followed-up by one reminder. Patients who were readmitted within 6 months did not receive a questionnaire on their second or consecutive hospital stay. The questionnaire contained six questions on demography and social data, five questions on social network, 39 questions on patient satisfaction (PS-RESKVA) [14], six questions on information concerning health promotion, 37 questions on health-related quality of life (SF-36) [15–21], and 13 questions on Sense of Coherence (SOC) [22]. Sixty-seven per cent (395) of the patients responded after one reminder.

Model

A model was developed hypothesizing associations between various independent variables and physical and mental health-related quality of life. A simplified path diagram model is shown in Figure 1. The independent variables may be conceived as being related to demography, education, health behaviour, social network, SOC and patient satisfaction. SOC is a stress-resistance construct developed by Antonovsky [23]. It was presupposed that all indirect variables could exert direct effects on health-related quality of life, and that SOC would find its place in the causal chain before patient satisfaction. The latter was based on the assumption that SOC is a more permanent trait, and not easily influenced by

a few days (on average 5) of stay at a hospital [23]. The SF-36 physical (PCS) and mental (MCS) component summary scales were treated as dependent variables [21], in two separate analyses.

Variables

The independent variables and the patient satisfaction questions are presented in Tables 1 and 2. The patient satisfaction questions were measured on a 5-point scale, and were re-coded to a 0–100 scale (0, 25, 50, 75, 100). The 13 patient satisfaction questions were included in the model on the basis of theoretical knowledge; they should describe a specific area of care, and they should be significantly correlated (Pearson's r ; $P < 0.05$) with at least one of the two SF-36 component summary scales. The mean PCS score was 45.0 (SD = 21.4, range 4–95) and the mean MCS score was 58.4 (SD = 22.1, total range 0–99). Both the physical and mental health scores were close to normally distributed.

Analysis

Data were analysed by multivariate regression analysis (SPSS for windows version 7.0). First, direct effects of the independent variables on health-related quality of life were calculated. A stepwise procedure was used. Criteria for entry of variables were probability of F-to-enter PIN(0.05) and probability of F-to-remove POUT(0.10). Thereafter, indirect effects were calculated according to principles of path analysis [24]. Indirect effects mediated by more than two intervening variables were so small that they had no practical implication, and were thus omitted. Total effects were calculated for each independent variable by summarizing direct and indirect effects. None of the independent variables had bivariate correlations (Pearson's r) higher than 0.7.

Results

Physical health

The regression coefficients of the variables significantly associated with the PCS in the multiple regression model are

Table 1 Distribution of numeric independent variables

Variable	Mean	SD	Scale range
Demography			
Age (years)	66.1	10.3	39–93
Social status			
Years of education	9.2	2.8	7–17
Sense of coherence			
Comprehensiveness	65.0	21.8	0–100
Meaningfulness	76.1	20.3	0–100
Manageability	72.4	21.6	0–100
Patient satisfaction			
Do you feel that you were erroneously treated in any way? (0 = very certain, 100 = not at all)	77.2	22.8	0–100
Did you experience that there was one physician accountable to you?	64.5	37.3	0–100
Did you feel that the physicians were empathic and cared for you?	76.8	29.3	0–100
Did you have confidence in the competence of the physicians?	83.9	22.5	0–100
Did you find the physicians easy to understand?	83.9	25.8	0–100
To what extent were your expectations fulfilled regarding medical treatment?	72.4	28.9	0–100
Did the nursing staff have sufficient time to speak to you?	68.9	30.1	0–100
Did you feel that the nursing staff were empathic and cared for you?	83.7	24.5	0–100
Did you find the nurses easy to understand?	90.8	18.1	0–100
Did you get the information you desired concerning results of tests and examinations?	85.3	23.5	0–100
Did you get the information necessary for you regarding how examinations should take place?	82.1	24.9	0–100
Were you able to communicate with the staff about matters that were important to you?	73.1	31.9	0–100
Did you have unanswered questions on medications on discharge from hospital?	82.0	30.5	0–100

Table 2 Distribution of independent indicator or ordinal variables

Variable	Value	%	Scale
Demography			
Sex	Female	36.7	Indicator
Health behaviour			
Smoking status	Non-smokers	81.5	Ordinal 0–1–2
	Rare smokers	5.8	
	Daily smokers	12.7	
Social network			
Number of persons you can communicate with in confidence	None	4.1	Ordinal 0–1–2
	One	22.2	
	Several	73.6	
Patient satisfaction			
Did anyone employed at the hospital give you advice as to what you could do to improve health or hamper aggravation?	Yes	23.0	Indicator
	No	67.0	
Do you feel that you were discharged at the right time?	Yes	80.3	Indicator
	No	19.7	

Table 3 Model for direct effects on physical component summary scale

Variable	Unstandardized coefficient (B)	Standardized coefficient (b)	P
Constant	45.89		0.000
Demography			
Age	-0.34	-0.16	0.002
Female	-9.44	-0.21	0.000
Social network	-3.99	-0.10	0.050
Days in hospital	-0.71	-0.09	0.074
Patient satisfaction			
Health promotion	4.96	0.16	0.003
Medical treatment	0.13	0.18	0.002
Nurses accessible	-0.07	-0.11	0.066
Sense of coherence			
Manageability	0.16	0.17	0.011
Meaningfulness	0.22	0.21	0.001

shown in Table 3. The model explained 29% of the variation in this scale. Of the explained variation 32% (9% of total variation in PCS) was explained by patient satisfaction items. Figure 2 shows the total effects of each independent variable on PCS ranked and divided into direct and indirect effects.

Fulfilment of expectations regarding medical treatment ($P=0.002$), and information about what to do to improve health or hamper aggravation (health information; $P=0.003$) exerted a strong direct effect on PCS (Table 3, Figure 2). Patients' perception of humaneness and competence among the physicians, and information about how examinations should take place and the results of such examinations, exerted important indirect effects on PCS ($P<0.01$; Figure 2) by contributing to improved fulfilment of treatment expectations and improved information about what to do to improve health or hamper aggravation. The SOC subscales manageability ($P=0.011$) and meaningfulness ($P=0.001$) were associated with high PCS, whereas advanced age ($P=0.002$) and female sex ($P<0.001$) were associated with low PCS (Table 3, Figure 2).

Mental health

The regression coefficients of the variables significantly associated with the MCS in the multiple regression model are shown in Table 4. The model explained 38% of the variation in this scale. Of the explained variation 19% (7% of total variation in MCS) was explained by patient satisfaction items. Figure 3 shows the total effects of each independent variable on PCS ranked and divided into direct and indirect effects.

Fulfilment of expectations regarding medical treatment ($P=0.034$), and information about how examinations should take place (information examinations) ($P=0.017$) exerted a strong direct effect on MCS (Table 3). Patients' perception of information concerning results of tests and examinations (information results), physician competence and physician and nursing humaneness exerted important indirect effects on mental health-related quality of life ($P<0.01$; Figure 3)

by association with fulfilment of treatment expectations and information about how examinations should take place. The SOC subscales comprehensiveness ($P<0.001$) and meaningfulness ($P<0.001$) were associated with high MCS, whereas advanced age ($P=0.013$), female sex ($P<0.001$) and length of stay in hospital ($P=0.025$) were associated with low MCS (Table 4, Figure 3).

Discussion

This study documents relatively strong associations between patient satisfaction and health-related quality of life among patients with angina pectoris. When adjusted for relevant background factors, patient satisfaction items accounted for 9% of the variation in the PCS and 7% in the MCS scales. In particular, fulfilment of expectations regarding medical treatment, information on health promotion, physician humaneness and physician competence seems to play a role for physical health-related quality of life as measured by SF-36. For mental health-related quality of life, fulfilment of expectations with medical treatment and various aspects of information play a major role. Although the associations may not be causal, the data suggest that for patients with angina, and probably for patients with many other chronic disorders, fulfilment of expectations concerning medical treatment and various aspects of information, should be focused upon in quality of life improvement strategies.

The model

As for most multivariate statistical models applied to interpret empirical data, the present model has weaknesses. It is likely that some of the relationships are not unidirectional. Two alternative interpretations are possible. First, it may be that health status is causative for patient satisfaction. Maybe healthier people are more satisfied because there is less need

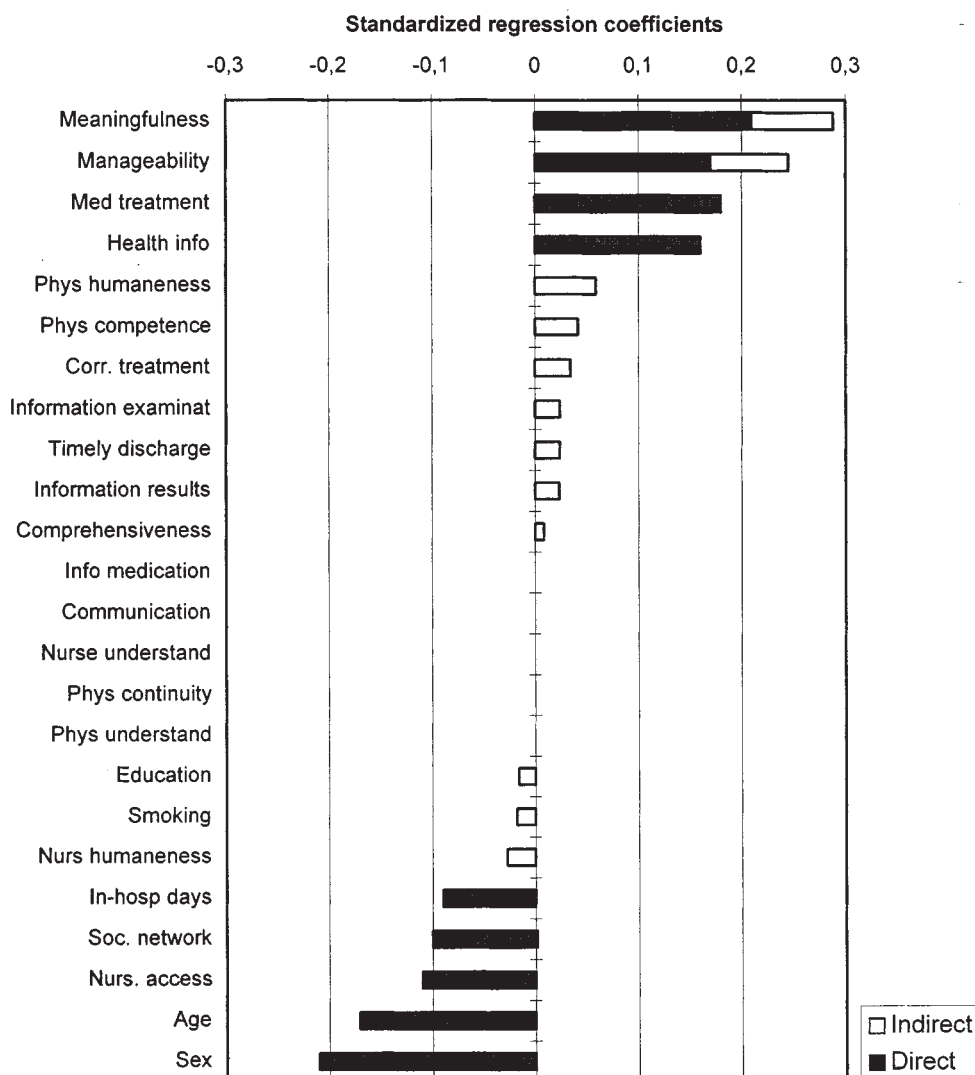


Figure 2 Total effects of different variables (direct effect + indirect effect) on the physical component summary scale.

Table 4 Model for direct effects on mental component summary scale

Variable	Unstandardized coefficient (B)	Standardized coefficient (b)	P
Constant	24.95		0.002
Demography			
Age	-0.25	-0.12	0.013
Female	-9.92	-0.22	0.000
Social network	-3.99	-0.10	0.050
Days in hospital	-0.84	-0.10	0.025
Patient satisfaction			
Information examinations	0.11	0.12	0.017
Medical treatment	0.08	0.11	0.034
Sense of coherence			
Comprehensiveness	0.22	0.22	0.000
Meaningfulness	0.34	0.31	0.000

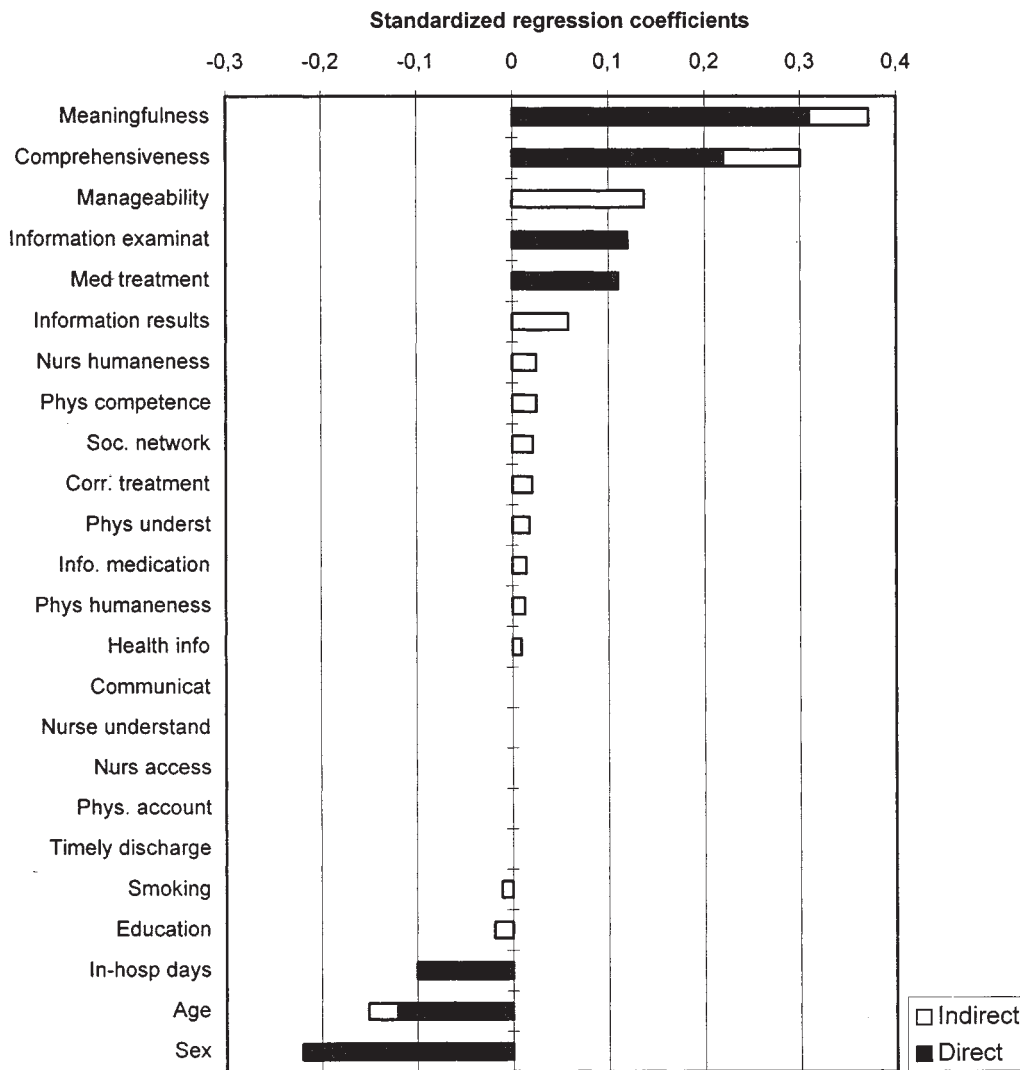


Figure 3 Total effects of different variables (direct effect + indirect effect) on the mental component summary scale.

for criticism; they will survive anyway, and can tolerate more slack in the provision of care. My response to this interpretation is that the results presented are quite logical; the associations between patient satisfaction and health-related quality of life are in those areas of patient satisfaction that should theoretically contribute to health, such as the quality of the medical treatment and the quality of health information. If health is causative for patient satisfaction (and not the other way around), why are there such weak associations, for example between physical health and whether nurses or physicians are easy to understand? There is, however, one association I believe is reciprocal. There is a significant direct association between the experience of access to nurses and poor physical health. In this case, it seems more logical that nurses rightly pay more attention to the patient with poor health status than that a lot of attention from nurses causes deteriorating health.

The other alternate interpretation of the relationships is that the associations between patient satisfaction and health are spurious. It could be that a common background factor

influenced both in a similar matter, but that there is no causal relationship between the two. While this is theoretically possible, it is not very plausible. The entire organization within hospitals is set up with the intention to influence patients' health status. It would be surprising if patients' experience with quality of care did not influence their health at all. I therefore conclude that patient satisfaction most likely is causative to health-related quality of life. To establish this causal relationship beyond the hypothetical level, one would have to study the phenomenon with an improved research design.

In this study, SOC is included and adjusted for through its three subscales manageability, meaningfulness and comprehensiveness. I have chosen to place the subscales of SOC as background factors in the model with possible influence on patient satisfaction. From a theoretical perspective, SOC is supposed to measure health promoting factors, be stable over longer periods of time, and be influenced relatively little by illness [23]. The SOC questions relate to areas of life over a long perspective of time. Theory claims that SOC influences

illness. In a similar way, it is obvious that it may also influence patient satisfaction. Theoretically, therefore, SOC is correctly placed in the model, in the causal chain before the satisfaction factors. Still I will not claim to be certain that neither the associations to patient satisfaction nor to health-related quality of life are unidirectional.

The single factors

Fulfilled expectations concerning medical treatment are the most important patient satisfaction predictor for health-related quality of life (Figures 2 and 3). Several other factors contribute to fulfilled expectations: patients' experience that physicians are competent, that respondents have been treated correctly, that doctors and nurses are good caregivers (humaneness) and the provision of information about results from examinations. All of these items seem important to create the atmosphere necessary to fulfil patients' medical expectations. Also contributing positively to fulfilment of expectations concerning medical treatment are meaningfulness, comprehensiveness, non-smoking status and lower educational status.

Various aspects of information seem to play an important role. Especially, receiving advice as to what one can do to improve health or prevent aggravation was associated with physical health-related quality of life, and receiving information regarding how examinations should take place and on the results of examinations was associated with improved mental health-related quality of life. In addition, patients who experienced humaneness from their doctors were more likely to appreciate information. Therefore, we may hypothesize that it is easier to get the information through to the patient when this is done in a caring and humane atmosphere.

It is apparent that the SOC scores are strongly associated with health, even when demographic factors and patient satisfaction are controlled for (Figures 2 and 3). According to the model, SOC exerts both a direct effect on health, and powerful indirect effects, mostly by being conducive to increased fulfilment of expectations of medical care. It may therefore be that the empowerment provided by increased internal coherence enables patients to be more realistic towards what is taking place in hospitals. It is of interest to observe that education and sex do not influence the SOC scales significantly. Our findings are consistent with research of others showing that SOC was a good predictor of less pain [25], well-being among elderly people [26] and increased coping among diabetics [27]. It has been shown that patients with angina vary considerably in their tolerance for their symptoms [28]. SOC may be a mediating factor.

Social network was (surprisingly) negatively associated with physical health (Table 3), but on the other hand exerted positive effects indirectly through strengthening meaningfulness and manageability, and experiencing more health information. I cannot fully explain why an increased social network should be associated with lower physical health. It is intriguing, but unlikely, that Norwegians' tendency to communicate about physical disease such as angina, should contribute to a better social network.

To my surprise, the effect of years of education on health-related quality of life was small. Years of education bivariately was significantly correlated with both physical and mental health, but this effect disappeared completely by introducing age and sex into the model, suggesting that in this material women and old people had less education. In fact, the negative indirect effect of education on experience of medical care would only contribute to poorer health. For this group of patients, therefore, it seems that the critical faculties engendered by education, do not contribute to better utilization of processes within the hospital.

The effects of age are naturally considerable, and more pronounced for physical than mental health (Figures 2 and 3). It is of interest, however, to study some of the intricate associations. Elderly people less often tended to experience receiving information on what they can do to improve their health status. This practice may contribute to decreased health of the elderly. This finding is concurrent with previous research documenting heavy discrimination of elderly concerning fibrinolytic therapy in acute myocardial infarction [29]. Age also tends to increase the angina patients' sense of manageability but on the other hand to decrease their experience of meaningfulness.

Female sex was negatively associated with both PCS and MCS scales (Figures 2 and 3). In the norms for males and females in general populations for the relevant age groups, the differences in scores among men and women are insignificant [21]. As the observed effects of sex in this data set is only direct on physical and mental health, it appears that angina among these patients was a more serious disease for women than it was for men; this hypothesis concurs with current medical knowledge [30], and it may also be that treatment is better tailored for men than for women. Previous research has suggested that women are less likely than men to receive intensive anti-ischaemic therapy, and less likely to undergo coronary angiography [9].

Conclusion

Patients who experienced better fulfilment of medical expectations and who were satisfied with the information given by physicians and nurses were more likely to have better physical and mental health-related quality of life 6–10 weeks after discharge from hospital. To improve the quality of life for these patients, I advocate that hospitals should focus on these items: competence and humaneness appear of importance to achieve these goals; health professionals should be careful not to discriminate on basis of age regarding informational issues. On the basis of this exploratory analysis, it is hypothesized that these associations are causal, but this needs to be verified through an improved research design.

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