

# A survey of patients' personal expenditure related to ambulatory surgery

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## Abstract

**Aim:** To examine the personal expenses for a patient admitted to hospital for a single ambulatory surgical procedure and to determine the factors related to the level of these expenses.

**Methods:** Patients (n = 145) treated in one ambulatory unit during a six-month period during 2004 were included in the study.

**Results:** Patients reported total personal costs from between 5 and 772. There was a difference between patients' expenses and the type of surgery and the patients' vocational education.

**Conclusion:** Effective interventions that reduce personal expenses are needed to make ambulatory surgery an economic treatment for individual patients.

**Keywords:** Health care costs; Patient's expenditure; Ambulatory surgical procedures.

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## Introduction

In the last two decades there has been an increase in the proportion of the Gross Domestic product (GDP) spent on public healthcare services mainly in the Organisation of Economic and Co-operative Development (OECD) countries. This has increased from the OECD average of 7.3% in 1990 to an OECD average of 8.9% in 2007 [1].

An increase in ambulatory surgery, rather than standard surgery, has reduced the costs of the public healthcare service [2]. Nowadays, the USA, Canada and Scandinavian countries have the highest rate of ambulatory surgery. Elective surgery is performed as an ambulatory procedure in 55% of cases in Denmark, 50% in Sweden, 48% in Norway and 37% in Finland. The proportion of ambulatory surgery is over 80% in the USA and Canada. [3]

Ambulatory surgery has been shown to be an economic and effective way to provide public health services. The savings using ambulatory surgery have been demonstrated in many areas of surgery for example laparoscopic cholecystectomy [4, 5] antireflux surgery, adrenalectomy and splenectomy [5], and arthroscopy [6]. However, these economic advantages have only been shown at a health organization and societal level.

In a publicly financed healthcare system patients need to pay only a small part of the ambulatory surgery costs. Some of these costs are standard whilst others are priced on an individual basis. This study focuses on ambulatory surgical patients' personal costs, which have not been reported in earlier studies.

The aim of this study is to describe the personal expenses for a patient admitted to hospital for a single ambulatory surgical procedure and to determine the factors related to the level of these expenses. The goal is to find out how the personal expenses varied depending on the demographic characteristics of the patient.

Research questions:

1. What personal expenses do ambulatory surgical patients pay?
2. What factors are related to the level of these expenses?

## Methods

### Design

A questionnaire survey was conducted over a six-month period during 2004 to analyse the personal costs of ambulatory surgical patients.

### Sample

The sample consisted of ambulatory surgical patients treated in an ambulatory surgical unit in a university hospital in Finland. This study included all ambulatory surgical patients admitted to hospital between March and August. Patients were included if they were 18 years old or over, Finnish speaking, able to complete a questionnaire by themselves and without diagnosed cognitive disorders. 200 patients fulfilled these criteria and 50 patients refused to participate in the study. Five patients were excluded because of the unavailability of questionnaires, and so a total of 145 patients were included in the study. The total response rate was 73%. Approximately 2900 adult patients are admitted annually into this unit [7].

### Hospital charges

A standard Finnish hospital charge for an ambulatory surgical operation was €72 (current fee €83.90) per patient during data collection. Usually, before an ambulatory surgical operation, the patient is required to visit an outpatient clinic, for which the personal charge was a maximum of €22 (current fee €25.60). Post-operatively the patients may receive a surgeon's prescription for medical rehabilitation at a health centre or hospital. These rehabilitation services cost the patient up to €6 (current fee €7) per visit [8]. Pre-

and post-operative pharmaceutical costs are also borne by the patient but this is mitigated by sickness insurance that reduces the cost of prescription medicines to 42% of the medication price [9].

### Data collection methods

Data were collected using a structured questionnaire formulated for this study. The questionnaire was based on the literature and the views of a clinical and scientific expert panel. The questionnaire was divided into seven areas of individual patient expenses a) hospital charge, b) bandaging material, c) rehabilitation equipment, d) medication, e) travel between home and hospital, and f) help from a significant other on the operation day and during rehabilitation post-operatively. The participants were also able to add any other relevant expenses with an explanation of their origin to the completed questionnaire. The patients' demographic variables requested consisted of gender, age, level of basic education, level of vocational education, and type of surgical operation. The questionnaires were distributed to the patients before being discharged home. The participants were asked to return the questionnaires two weeks after discharge by post. This was thought to be an appropriate time allowing for clinical recovery so that the research participants would know all their pre- and post-operative expenses.

### Ethical considerations

This study was approved by the University Hospital Committee for Medical Investigation. Patients gave their informed consent to become a volunteer research participant.

### Data analysis

The statistical software package SAS Release 8.02 was used to analyse the data. The demographic variables and personal expenses were analysed using descriptive statistics. The personal expenses variables were organized into five sum variables: total personal costs, hospital charge, equipment costs (treatment and rehabilitation), medication and other costs. Patients' personal expenses results were categorized into either three groups using 25 and 75 percentiles or two groups using 50 percentile according to the distribution of the expenses.

Differences between demographic variables and personal expenses were determined using the ANOVA one-way analysis. Percentiles and the Chi-square test were used to describe personal expenses and for determining the relationships between the level of personal expenditure and the demographic variables. In all tests,  $p < 0.05$  was considered statistically significant.

## Results

### Sample characteristics

Over half of the participants were female (53%, Table 1). The mean age of patients was 48 years (range 19–83). The largest group of patients had completed basic education at the comprehensive school level (44%). The largest group within those who had completed

Table 1. Demographic variables (n = 145).

Variable	n = 145	%
<b>Gender</b>		
Male	68	47
Female	77	53
<b>Age, years</b>		
19 – 34	30	20
35 – 50	50	35
51 – 65	50	35
66 – 83	15	10
<b>Basic education</b>		
Elementary school	40	28
Comprehensive school	63	44
Matricular examination	39	28
<b>Vocational education</b>		
Secondary level	58	43
Post-secondary level	34	25
Academic level	18	13
No vocational education	25	19
<b>Surgical procedure</b>		
Shoulder	26	18
Knee	30	21
Other orthopaedic	64	44
Other ambulatory	25	17

vocational education were at the secondary level (43%). About two fifths of the patients required either knee (21%) or shoulder (18%) arthroscopy. The rest of the patients required other orthopaedic operations (44%). These included hardware removal, various hand operations or other ambulatory operations such as urological or plastic surgery (17%). Most of the patients (n=87, 80%) took sick leave after their operation. The average duration of sick leave taken was 35.4 days (range 1–94).

### Ambulatory surgical patients' personal expenses

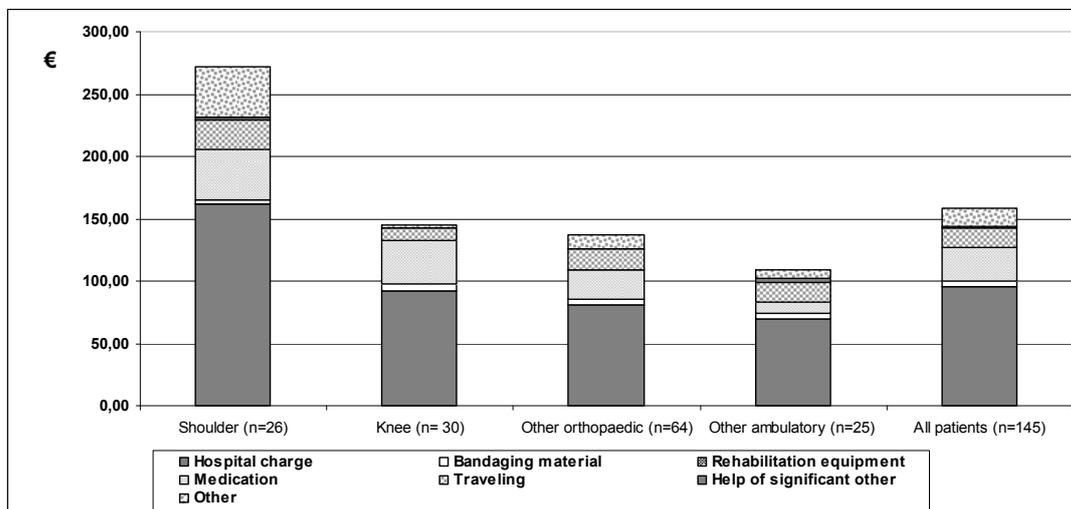
Almost all patients (n=128, 88%) reported personal expenses relating to their ambulatory surgery (Table 2). The total expenses ranged from €5 to €772 (M=182.4, SD=45.8). In addition, very low costs were incurred by individuals for home aid, a home nurse, car parking during the hospital stay and rehabilitation after discharge. None of the research participants incurred rehabilitation equipment costs.

Using the 25 and 75 percentiles of the expenses the total patient expenditure was grouped into three levels: low (under €100), medium (€100–199) and high (€200 or over). Almost half of the patients' expenditure (n=58/127, 46%) fell into the medium level and about one third (n=38/127, 30%) fell into the low level. The remaining quarter (n=31/127, 24%) was in the high level group.

The patients who spent money on the hospital charge, bandaging material, medication and other costs were divided into two groups

Table 2 Ambulatory surgical patients' personal costs in Euros.

Personal costs	n	M	SD	range
Total costs	128	182,4	45,8	5–772
Hospital charge	121	114,5	104,5	0–542
Cost for medication	93	35,3	37,4	0–270
Travel	93	25,6	26,2	0–156
Bandaging material	48	9,1	14,4	0–72
Help for significant other	35	4,9	14,4	0–50
Investigation costs	9	82,2	107	6–350
Costs for a medical certificate	7	12,3	7,9	6–28



**Figure 1** Day surgery patient's personal costs according to operation speciality.

using 50 percentile reflecting low and high levels of expenditure. The low and high level of the hospital charge ranged from €0-99 and €100 and over respectively. Most of the patients had a hospital charge at the low level (n=99/127, 78%). Bandaging material costs were grouped at the low level under €10 and the high level €10 and over. Again most of the costs were incurred at the lower level (n=97/127, 76%). The two groups for medication costs were under €50 and €50 and over. These were also largely incurred at the lower level (n=102/127, 80%). Lastly, most of the patients (n=102/127, 80%) had spent under €50 on other costs.

### Factors related to the level of expenditure

By using the ANOVA one-way analysis the reported patient expenditure and the demographic variables were found to be related to the type of surgical operation and the patients' vocational education. Orthopaedic patients spent more money on their medication (M=30.0, SD=37.9, min. 0, max. 270.0) than patients requiring other surgical operations (M=8.7, SD=12.9, min. 0, max. 60.0, p=0.006). Patients with a vocational education at the secondary level spent the most on bandaging material (M=6.1, SD=12.1, min. 0, max. 72.0) whilst patients with no professional education spent the least (M=0.9, SD=3.1, min. 0, max. 15.0, p=0.006). However, these costs were so low, that they had a minimal impact on the total costs.

The difference between the level of spending and the type of the surgical procedure was examined in more detail. There were associations between the total expenditure, hospital charge and medication costs with the type of surgical procedure. Patients requiring a shoulder procedure had the highest total expenses (M=272.4, SD=200.9, min. 0, max. 680.0, p<0.0001, Fig. 1), hospital charges (M=162.3, SD=158.5, min. 0, max. 542.0, p=0.003) and medication costs (M=40.7, SD=34.1, min. 0, max. 126.5, p<0.005). The patients requiring non-orthopaedic procedures had the lowest total costs (M=108.8, SD=66.8, min. 0, max. 320.0), hospital charges (M=69.2, SD=47.0, min. 0, max. 250.0) and medication costs (M=8.7, SD=12.9, min. 0, max. 60.0).

Relationships between the factors that increased patient expenditure, at the total and specific level, and the patients' demographic variables were computed searching for factors that increased the expenditure. About half the orthopaedic patients (n=49/104, 47%) had a medium sized total expenditure for their surgical operation. 25% of the orthopaedic patients (n=26/104), spent under €100 (low) for their surgical operation and 28% had paid €200 or over (high, n=29/104). About half of the other surgical patients (n=12/23, 52%) had a low total personal expenditure and 39% (n=9/23) a medium personal

expenditure. 9% of non-orthopaedic patients (n=2/23) had spent €200 or over. The relationship between total costs and type of surgery operation was statistically significant (Chi-square test, p=0.021).

Secondly, the detailed evaluation of the relationship between the personal patient expenditure and their demographic variables revealed that the type of surgical operation and the level of basic and vocational education were significantly related to the level of expenditure.

The hospital charge was considered by dividing the participants into two groups viz: those who spent up to €100 and those who spent €100 or over. Patients who had required an orthopaedic surgical operation had a high hospital charge (n=27/104, 26%, p=0.024). One fourth of the orthopaedic patients (n=24/104, 23%) had spent €50 or over on medication compared to all other patients who, for the most part, spent under €50 on their medication (n=22/23, 96%, p=0.041).

## Discussion

There is no previous research considering the personal costs of ambulatory surgical patients in a publicly financed healthcare system making this work an important addition to the literature. The requirement for orthopaedic ambulatory surgery was the main factor affecting patient expenditure. Patients requiring orthopaedic surgery had the highest costs for medication compared with patients requiring other operations. This may be due to the difference in pain intensity after the operation linked to the postoperative use of analgesics. Orthopaedic operations of the extremities, as a group, have been reported to be the most painful operations [10]. The patients that required a shoulder procedure had the highest expenses. This may be due to the number of postoperative visits to hospital or public/private health care centres during the recovery phase. In earlier studies it has been shown that pain is one of the main reasons for postoperative visits to hospital after ambulatory surgery [11,12].

At present when a patient is in pain post-operatively they usually have to contact the centre where their treatment took place. The number of these post-operative contacts, resulting in the prescription of medication and associated costs, may be reduced with appropriate and empowering patient education in pre-admission clinics, day surgical units and during the discharge phases of the healthcare episode. Also some patients might manage more of their recovery at home without the aid of healthcare staff if this were done. Patients did not spend

money on rehabilitation equipment. This is because patients may use equipment, for example forearm crutch or collar cuff, on free loan from the Assistive Device Services organised by Finnish health centres [13]. Expenditure on bandaging materials was low which may be due to a low wound infection rate.

The results indicate that patients pay more for their ambulatory surgery than the standard costs enshrined in law. The way patients pay more for their ambulatory surgery differs amongst individuals for example the expenses reported by patients vary according to the different ways they are subsidised. One important way treatment and care is subsidised for some patients is the use of private sickness insurance.

Our most important finding was that ambulatory surgical patients in the government financed healthcare system spent an average almost €200, around €100 above the standard costs. The hospital charge was the highest single cost, which included a fee for all healthcare services, from the pre-operative phase to two weeks post-operatively. This charge is variable depending on the services used for example the hospital charge increases with the number of post-operative visits to private facilities. Overall the cumulative personal expenditure for individuals was found to be quite high. About 25% of the patients had a total expenditure of €200 or over, (high level) and almost 50% of the patients had a total expenditure of €100–€199 (medium level).

### Limitations of the study

This study has limitations in the sample and the instrument. Our sample included patients from only one university hospital. Even though publicly financed healthcare services in other OECD countries have a similar payment structure for ambulatory surgical costs, the results should be generalized with caution.

Future research should focus on a more detailed level analysis of individual patients' personal expenses. The patients need exact instructions about how to calculate their personal expenses, for example to define the nature of hospital charges. Also questions that would help to capture the relationship between private sickness insurance and personal patient expenditure need to be added to the questionnaire.

Although it is known that ambulatory surgery has cost benefits to society it is important to take account of personal patient expenditure when the total costs of ambulatory surgery are considered. Ways of decreasing the financial burden on the patient must also be considered wherever possible.

## Conclusion

The total costs of ambulatory surgery from a personal and a societal perspective should be examined in order to find out the real economic advantages of ambulatory surgery. Interventions, such as patient education, that reduce patients' expenses making ambulatory surgery a more economic choice from the perspective of individual patients as well as society also need to be carried out. It may be that ambulatory surgery is cheaper for society because some costs are transferred to the individual patients.

## Acknowledgements

We wish to thank Norman Rickard, BSc (hons) MSc RN, for his help with the English language.

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