



Original Research

Patient-reported adverse events after hernia surgery and socio-economic status: A register-based cohort study

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HIGHLIGHTS

- No inequality of the utilization of healthcare resources related to educational level or civil status was observed.
- Inequality, however, was perceived in relation to ethnic background and gender.
- The number of patient-perceived adverse events was about five times higher than the registered complication rate in the Swedish Hernia Register.

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ABSTRACT

Background: The aim of the present study was to assess how socio-economic background influences perception of an adverse postoperative event after hernia surgery, and to see if this affects the pattern of seeking healthcare advice during the early postoperative period.

Materials and Methods: All patients aged 15 years or older with a primary unilateral inguinal or femoral hernia repair recorded in the Swedish Hernia Register (SHR) between November 1 and December 31, 2002 were sent a questionnaire inquiring about adverse events. Data on civil status, income, level of education and ethnic background were obtained from Statistics Sweden.

Results: Of the 1643 patients contacted, 1440 (87.6%) responded: 1333 (92.6%) were men and 107 (7.4%) women, mean age was 59 years. There were 203 (12.4%) non-responders. Adverse events were reported in the questionnaire by 390 (27.1%) patients. Patients born in Sweden and patients with high income levels reported a significantly higher incidence of perceived adverse events ($p < 0.05$). Patients born in Sweden and females reported more events requiring healthcare contact. There was no association between registered and self-reported outcome and civil status or level of education.

Conclusion: We detected inequalities related to income level, gender and ethnic background. Even if healthcare utilization is influenced by socio-economic background, careful information of what may be expected in the postoperative period and how adverse events should be managed could lead to reduced disparity and improved quality of care in the community at large.

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1. Introduction

1.1. Background

One of the most important aims of the Swedish Healthcare Act, besides quality of care, is to guarantee equality of access to care. Nevertheless, utilization of healthcare may not only be dependent

on need, but also on the individual and the structure related to the social or economic background of the patient [1]. One of the best tools for studying inequality based on geography or demography is the patient register. The Swedish Hernia Register (SHR) has previously been used in studies of healthcare utilization and discordance between patient-perceived need for healthcare and the surgeon's view of the expected postoperative course [2] [3]. It is not known, however, whether or not discordance between the perceptions of the patient and healthcare provider varies with the patient's socio-economic background.

In a previous study, the incidence of patient-reported adverse events was higher than the complication rate registered in the SHR

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[3]. The surgeon seems to identify fewer complications than those perceived by the patient him/herself [2]. Adverse events perceived by the patient, on the other hand, may be considered an expected outcome by the surgeon [2]. Reporting is more accurate when the defined event can be verified by an objective examination [4], pain, for instance, being a solely subjective outcome, tends to be underestimated by the surgeon [2].

The incidence of perceived adverse events may vary between different patient groups. Younger patients seem to report more adverse events, especially pain [3] [5]. Type of hernia, BMI and smoking habits had, however, no impact on patient-perceived adverse events [3]. Patients with low income more often present with incarcerated or strangulated hernias and require longer hospital stay [6]. Furthermore, Afro-Americans are more likely to present with an acute complication requiring readmission and acute surgery, a difference persisting after correction for socio-economic status [6].

1.2. Objectives

The aim of the present study was to assess how socio-economic background influences the perception of an adverse postoperative event after inguinal hernia surgery, and to assess whether this influences contact with the healthcare services in the event of dissatisfaction with the outcome of surgery.

2. Material and methods

This study is based on all male and female patients aged 15 years or older registered in the SHR November 1 to December 31, 2002, for repair of primary unilateral groin hernia. The SHR contains information on more than 200 000 inguinal hernia operations since 1992 of patients 15 years and older [7]. Almost 100% of inguinal hernia operations in Sweden have been included in the register. Variables recorded include hospital, National Registration Number (NRN—a unique personal identification number assigned to all Swedish residents), gender, age, type of hernia (including left/right side) as noted during the operation, and type of repair [7].

Included patients received a questionnaire by regular mail in March 2003. Two reminding letters were sent after 5 and 10 weeks to non-responders. Questions were asked about adverse events or any symptoms that the patient perceived as abnormal occurring

within the first 30 postoperative days. Patients were further asked whether they had sought healthcare for such events. Descriptive results and differences between patient and surgeon perception of an adverse event have previously been published [3].

2.1. Statistical methods

Data on socio-economic background were obtained by cross-linking the study population with Statistics Sweden [8], using the National Registration Number (NRN) [9]. Statistics Sweden is a national database containing the NRN of every resident and detailed data regarding health and socio-economy. From Statistics Sweden [8], data on income, education level, civil status and country of birth (Sweden/other country) were obtained for each study participant. Differences between the groups were tested with χ^2 statistics.

The research is being reported in line with the STROBE criteria (Strengthening the reporting of observational studies in epidemiology).

The study was approved by the Stockholm Regional Ethics Committee (2010/583-31/2) and followed the Declaration of Helsinki. The participants provided informed written consent.

3. Results

Of the 1643 patients included, 1440 (87.6%) responded; 1333 (92.6%) were men and 107 (7.4%) women, mean age was 59 years. There were 203 (12.4%) non-responders, including 11 patients who had died before the questionnaire was distributed and 17 who could not be identified in the population register. Adverse events were reported in the questionnaire by 390 (27.1%) patients. Of those who stated an adverse event, 196 sought help from the healthcare system.

Patients born in Sweden and patients with high income levels reported a significantly higher incidence of perceived adverse events than patients of other ethnical backgrounds and patients with income levels below the median ($p < 0.05$). Patients born in Sweden and females reported more events leading to contact with the healthcare system ($p < 0.05$). Though women reported more events leading to contact with the healthcare system ($p < 0.05$), no difference was seen in the over-all incidence of perceived adverse events between men and women. There was no association

Table 1
Patient-perceived adverse events and complications recorded in the register.

	Complication recorded in the Swedish hernia register	p	Patient- perceived adverse event	p	Contact taken with healthcare for perceived adverse event	p
Gender		0.447		0.281		0.007
Men	78/1333 (5.9%)		358/1333 (26.9%)		172/1333 (12.9%)	
Women	7/107(6.5%)		32/107 (29.9%)		24/107 (22.4%)	
Ethnic background		0.194		0.011		0.019
Born in Sweden	79/1299 (6.1%)		359/1299 (27.6%)		184/1299 (14.2%)	
Born abroad	5/132 (3.8%)		24/132 (18.2%)		10/132 (7.6%)	
Income level		0.285		0.006		0.465
Above median	45/715 (6.3%)		213/715 (29.8%)		98/715 (13.7%)	
Below median	39/716 (5.4%)		170/716 (23.7%)		96/716 (13.4%)	
Level of education		0.330		0.115		0.283
At least three years of higher education	12/173 (6.9%)		57/173 (32.9%)		28/173 (16.2%)	
Less than three years of higher education	55/950 (5.8%)		279/950 (29.4%)		135/950 (14.2%)	
Civil status		0.153		0.454		0.385
Married/partnership	59/931 (6.3%)		248/931 (24.3%)		129/931 (13.9%)	
Single/divorced/widow	24/495 (4.8%)		134/495 (27.1%)		65/495 (13.1%)	
Total	85/1440 (5.9%)		390/1440 (27.1%)		196/1440 (13.6%)	

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