

Cost and utilisation of healthcare resources during rehabilitation after ankle fracture are not linked to health insurance, income, gender, or pain: an observational study

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Question: What are the costs and utilisation of healthcare resources, their determinants, and quality of life for people attending outpatient physiotherapy after ankle fracture? **Design:** Longitudinal observational study. **Participants:** Ninety-four adults (2 dropouts) following cast removal after isolated ankle fracture attending outpatient physiotherapy at three hospitals in Sydney, Australia. **Outcome measures:** Costs incurred (direct healthcare costs and out-of-pocket costs) and utilisation of healthcare system resources were measured at 4, 8, 12, 16, 20, and 24 weeks. Quality of life was measured shortly after cast removal and at 4, 12, and 24 weeks. Factors known to influence costs and utilisation in other conditions (private health insurance, income level, gender, and pain) were also measured. **Results:** The total cost per person was AUD 735 (SD 876) over 24 weeks. Outpatient physiotherapy accounted for the highest costs in both direct healthcare (39%) and out-of-pocket (42%) costs. Less than 20% of participants sought private non-medical care in addition to receiving outpatient physiotherapy. None of the factors investigated had a significant influence on costs and utilisation. Quality of life score improved over the 24 weeks by a mean of 6.1 points out of 45 (95% CI 5.2 to 6.9), with most of the improvement occurring in the domain of independent living. **Conclusion:** Information on costs and utilisation of healthcare resources can be used to plan health services, eg, the number of physiotherapy sessions required after ankle fracture. Private health insurance, income level, gender, or pain did not influence the costs or the decision behind seeking care over and above publicly-provided physiotherapy. [Lin CC, Haas M, Moseley AM, Herbert RD, Refshauge KM (2008) Costs, utilisation of healthcare resources, and quality of life in people attending outpatient physiotherapy after ankle fracture: an observational study. *Australian Journal of Physiotherapy* 54: 201–208]

Key words: Costs and cost analysis, Quality of life, Physiotherapy (specialty), Ankle injuries, Fractures, bone

Introduction

Ankle fracture is generally managed conservatively in the outpatient setting (Brink et al 1996) or with a short period of hospitalisation for surgical fixation (James et al 2001) followed by outpatient management. The direct healthcare cost of ankle fracture in the outpatient setting was estimated in 2002 to be USD 333 per person over 12 months (Bhandari et al 2004). However, these authors did not provide details of how the healthcare resources were used and this cost did not include the cost of outpatient physiotherapy.

The costs and utilisation of healthcare resources are affected by several factors. People without health insurance cover generally incur fewer costs and utilise fewer resources than people with insurance (Duru et al 2007, Hadley 2007, Nelson et al 2005, Ward and Franks 2007), due to higher out-of-pocket costs when resources are utilised. While health insurance status may be associated with other factors which may also influence utilisation, such as the level of income (Ward and Franks 2007), a recent survey suggests that health insurance and income may be independent determinants of healthcare utilisation in the United States (Nelson et al 2005). In musculoskeletal conditions resulting in pain, research has shown that determinants of utilisation of health resources include gender (von Korff et al 2007,

Walker et al 2004) and pain severity (Carey et al 1995, Carey et al 1996, Cote et al 2001, Mortimer et al 2003, Vingard et al 2002, von Korff et al 2007, Walker et al 2004); ie, women and those experiencing greater levels of pain tend to utilise more resources. It is not known if these factors (private health insurance, income level, gender and pain) also influence costs and healthcare utilisation after ankle fracture.

We recently undertook an economic evaluation alongside a randomised controlled trial of participants following ankle fracture, which evaluated the effectiveness of adding joint mobilisation to an exercise program (Lin et al 2008, Lin et al 2006). In the trial, participants were randomly allocated to receive one of two physiotherapy programs: *joint mobilisation plus exercise* or *exercise alone*. The joint mobilisation technique used was anterior-posterior glide of the talus (Hengeveld and Banks 2005), applied twice each week for 4 weeks. Exercises prescribed included ankle mobility, strengthening, stepping, weight-bearing, and balancing exercise. We found no clinically-worthwhile differences in outcomes between the *joint mobilisation plus exercise* and *exercise alone* groups (Lin et al 2008). There was also no difference between the groups in the total costs incurred.

The aim of this paper is to report fully the results of the economic analysis. The research questions addressed are:

1. What costs are incurred and what healthcare resources are utilised by patients receiving outpatient physiotherapy following ankle fracture?
2. What are the determinants of the total cost of care?
3. What are the determinants of utilisation of private non-medical services?
4. What are the outcomes for patients in terms of quality of life?

Method

Design

This is a secondary analysis of data obtained from a randomised controlled trial of outpatient physiotherapy from cast removal after ankle fracture (Lin et al 2008, Lin et al 2006) in which blinded follow-up assessments occurred at 4, 12, and 24 weeks after entry to the study. Because there were no between-group differences in outcomes (including activity limitation, quality of life, and the total cost of care) at any follow-up time point, data for the entire cohort were used for the analyses reported in this paper. Characteristics of participants were measured at baseline while data on costs and utilisation of healthcare services were collected using a questionnaire (see Appendix 1 on eAddenda for questionnaire), administered in person at the 4-, 12-, and 24-week follow-up, and by post or telephone (according to participants' preference) at 8, 16, and 20 weeks (Figure 1). Pain was measured at baseline and information on health insurance status and income level was collected at Week 4. The economic aspect of the study was designed from the perspectives of both the Australian public healthcare system and individual patients.

Participants

Participants were recruited from the physiotherapy departments of three large public teaching hospitals in Sydney, Australia, following cast removal for ankle fracture. Inclusion criteria were: isolated ankle fracture treated with cast immobilisation with or without surgical fixation, cast removed in the preceding 7 days, approval to weight-bear as tolerated or partial weight-bear, referral to physiotherapy outpatients, at least 2 out of 10 pain in the ankle on the visual analogue scale (Huskisson 1974) when distributing weight evenly on both legs at the time of cast removal, completed skeletal growth, and available for the 24-week follow-up period.

Outcome measures

Cost and utilisation of healthcare resources: Table 1 lists the type of resources collected and the unit costs of these resources. Outpatient physiotherapy was valued using the physiotherapist salary rates of New South Wales Health. Medical services, hospitalisation and government-subsidised pharmaceuticals were valued using costs listed in the Medical Benefits Schedule, New South Wales Health Costs of Care Standards, and Pharmaceutical Benefits Scheme. Visits to outpatient physiotherapy and medical specialists were priced differently for initial visits and subsequent follow-ups as typically more time is required for an initial visit. Out-of-pocket costs were actual costs as reported by participants, taking into account government rebates where appropriate (ie, gap costs were recorded). The costs of the

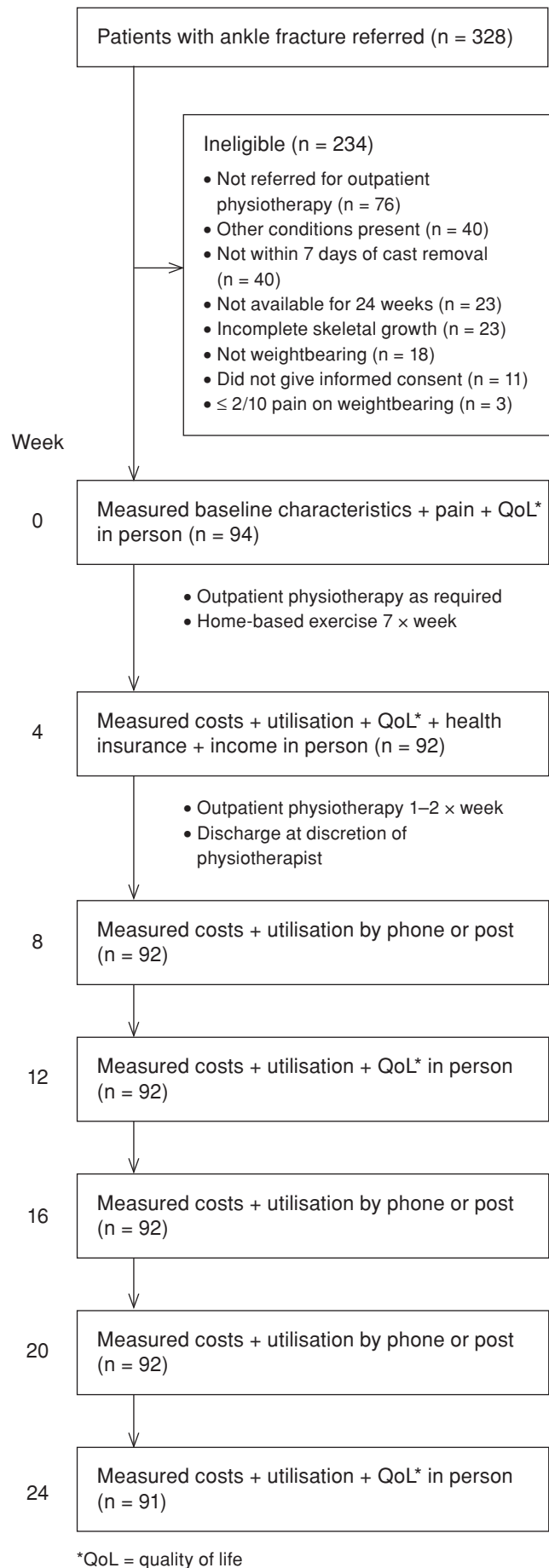


Figure 1. Design and flow of participants through the trial.

Table 1. Unit costs of healthcare resources used.

Resources	Cost (AUD)	Source
Public healthcare system		
Outpatient physiotherapy	33.92/initial session, 16.96/subsequent session	New South Wales Health award rates at www.health.nsw.gov.au/jobs/empcond/classifications.html
Medical specialists	133.35/initial session, 66.75/subsequent session	Medical Benefits Schedule at www9.health.gov.au/mbs/
Hospitalisation	Various	Medical Benefits Schedule at www9.health.gov.au/mbs/ New South Wales Health Costs of Care Standards at www.health.nsw.gov.au/policies/gl/2005/GL2005_071.html
General practitioners	32.10/visit	
Investigations	Various	Medical Benefits Schedule at www9.health.gov.au/mbs/
Government-subsidised medication	Various	Pharmaceutical Benefits Scheme at www.pbs.gov.au/html/home
Emergency department	162.00/visit	New South Wales Health Costs of Care Standards at www.health.nsw.gov.au/policies/gl/2005/GL2005_071.html
Out-of-pocket		
Private health services	Various	As reported by participants
Gap costs of visits to medical specialists and general practitioners, hospitalisation, investigations, and government-subsidised medication	Various	As reported by participants
Non government-subsidised medication and other purchases	Various	As reported by participants
Transport (bus, train, taxi fares, tolls, parking)	Various	As reported by participants
Use of private vehicle	0.66/km	Australian Taxation Office at www.ato.gov.au/

use of a private vehicle in attending appointments were based on the rate of a medium-sized vehicle per business kilometre published by the Australian Taxation Office.

The total cost of care was defined as the sum of direct costs to the public healthcare system plus participants' out-of-pocket costs (including visits to both medical and non-medical services). Although all participants received outpatient physiotherapy, some still sought private non-medical services. Utilisation of private non-medical services was defined as seeking care from any non-medical provider in the private sector, including private physiotherapy. Visits to medical professionals in private practice were excluded as medical professionals provide services that cannot be provided by physiotherapists. Utilisation of private non-medical services was dichotomised as 'Yes' or 'No'.

Determinants of cost and utilisation of private non-medical resources: The influence of socioeconomic (private health insurance, income level), demographic (gender), and clinical (pain) factors on the total cost of care and utilisation of private non-medical services was investigated. These factors were chosen based on findings from previous studies. Private health insurance was defined as having insurance that included cover for private non-medical services (often termed ancillary services in Australia). Income level (AUD) was the annual household income divided into eight

categories (based on the categories used by the Australian Bureau of Statistics, www.abs.gov.au): 0 to 6239, 6240 to 15 599, 15 600 to 25 999, 26 600 to 36 399, 36 400 to 51 999, 52 000 to 77 999, 78 000 and above, and 'did not wish to answer'. Pain was measured on the visual analogue scale as the participants' rating of their level of pain when standing with weight equally distributed through the affected and unaffected leg (Huskisson 1974).

Quality of life: Quality of life was measured using the Assessment of Quality of Life (AQoL) scale (Hawthorne and Osborne 2005, Hawthorne et al 2001, Hawthorne et al 1999), which has 15 questions covering five domains: illness (use of medicines, reliance on medicines and medical aid, need for regular treatment), independent living (assistance with self care, assistance with household tasks, mobility), social relationships (with others and family), physical senses (vision, hearing, communication), and psychological wellbeing (sleep, low mood, pain). The AQoL can be used to provide profiles of health-related quality of life, with a maximum score of 9 per domain and 45 in total where a higher score indicates poorer quality of life.

Data analysis

Participants for whom no economic data were available (ie, those who withdrew from the study before the first collection of the economic data at the 4-week follow-up)

Table 2. Baseline characteristics of participants.

Characteristic	n = 92
Gender, n female (%)	41 (45)
Age (yr), mean (SD)	41.7 (14.8)
Cause: n fall/sports/motor vehicle accident/other	55/24/7/6
Fracture severity: n unimalleolar/bimalleolar or trimalleolar	61/31
Surgery, n yes (%)	56 (61)
Length of cast immobilisation (d), mean (SD)	43 (8)
Weight-bearing status at time of cast removal, n partial/as tolerated/full	4/79/9
Time since the fracture (d), mean (SD)	47.4 (7.5)
Health insurance for private non-medical services, n yes (%)	44 (48)
Annual household income (AUD), n (%)	
0 to 6239	5 (5)
6240 to 15 599	4 (4)
15 600 to 25 999	3 (3)
26 600 to 36 399	2 (2)
36 400 to 51 999	15 (16)
52 000 to 77 999	15 (16)
78 000 or more	36 (39)
Did not wish to answer	12 (13)

were omitted from data analysis. Otherwise, missing data were replaced by the last known value carried forward. Descriptive statistics are reported for utilisation, costs and quality of life scores. Costs are reported as undiscounted costs for 2005/2006, calculated to the value of the Australian dollar in 2005 (1 AUD = 0.72 USD = 0.45 GBP based on purchasing power parities, www.oecd.org). Discounting is not relevant as recovery from a fractured ankle usually occurs within months rather than over years.

Univariate linear regression was used to investigate determinants of total costs. Prior to undertaking this analysis, we calculated that our sample size provided an 80% probability to detect a correlation of 0.4 between each of the four factors and the outcome of interest, assuming correlations of 0.2 between the factors (Maxwell 2000). Because the distribution of total costs was skewed, we used the log transformation of total costs as the dependent variable. Univariate logistic regression was used to investigate determinants of utilisation of private non-medical services. For the independent variables, private health insurance (yes/no) and gender (female/male) were entered into the model as dichotomous variables. Income level was entered into the model as a continuous variable, with each income category given a dummy code. Data from participants who did not provide information about income level (n = 12) were omitted from this analysis. Pain was also entered into the model as a continuous variable. The intention was to examine significant factors ($p \leq 0.20$) using multiple regression.

Results

Participants

A total of 94 participants were recruited (Fig. 1). Two people withdrew consent before the 4-week follow-up.

Table 3. Mean (SD) direct cost to public healthcare system and out-of-pocket costs over 24 weeks.

Item	Cost (AUD)
Public healthcare system [^]	
Total	411.73 (588.70)
Outpatient physiotherapy	158.74 (83.95)
Medical specialist	127.04 (182.33)
Hospitalisation	57.84 (390.34)
General practitioner	26.52 (75.78)
Investigations	23.19 (118.77)
Government-subsidised medication	14.50 (72.96)
Emergency department	3.52 (75.40)
Out-of-pocket ⁺	
Total	323.43 (466.80)
Outpatient physiotherapy	134.91 (134.74)
Private non-medical service (excluding private physiotherapy)	91.72 (296.36)
Private physiotherapy	36.79 (181.68)
Other purchases	29.15 (67.78)
Medical specialist	23.31 (56.07)
Investigations	14.01 (72.57)
Hospitalisation	11.30 (105.91)
Medication	10.67 (44.33)
General practitioner	8.09 (24.31)
Emergency department	0.27 (2.59)
Total (public healthcare system + out-of-pocket)	735.16 (876.10)

[^] = direct costs to public healthcare system; ⁺ = costs of private health services, gap costs of visits to medical specialists and general practitioners, gap costs of investigations and government-subsidised medication, non government-subsidised medication and other purchases, transport and use of private vehicle

One additional person was unable to be contacted for the final follow-up but their Week 24 data was carried forward from Week 20. Therefore, the final analysis consisted of 92 participants (Table 2).

Costs and utilisation of health care resources

The costs and utilisation of healthcare resources over the 24-week follow-up period are presented in Tables 3 and 4, respectively. The average total cost per person for 24 weeks after cast removal was AUD 735 (SD 876). Outpatient physiotherapy accounted for the highest costs in both direct healthcare (39%) and out-of-pocket (42%) costs. The medical specialists most commonly visited by participants were orthopaedic surgeons where 57% of participants utilised this service for an average of 1.7 visits (SD 1.1). The private non-medical healthcare providers most commonly utilised by participants were private physiotherapists, with 7% of participants utilising this service for an average of 9.3 visits (SD 8.7).

Determinants of cost and utilisation of private non-medical resources

The total cost of care per person was not influenced by private health insurance, income level, gender, or pain (Table 5). As well as receiving outpatient physiotherapy in the public hospital, 17 (19%) participants sought care from private non-medical services. However, none of the factors

Table 4. Utilisation of healthcare resources.

Resource	% of participants using	Mean (SD) number of visits if service was used
Outpatient physiotherapy	100.0	8.3 (4.9)
Medical specialists [^]	57.6	2.2 (2.2)
General practitioners	25.0	3.3 (3.8)
Private non-medical services ⁺	18.5	9.1 (8.9)
Emergency department	2.2	1.0 (0.0)
Hospital admission	4.3	3.8 (5.5) days

[^] = orthopaedic surgeons, radiologists, haematologists and vascular surgeons (for deep vein thrombosis), sports medicine physicians, cardiologists, traumatologists; ⁺ = private physiotherapy, massage, acupuncture, podiatry, chiropractic, lymphatic drainage, osteopathy, Bowen therapy, Chinese medicine, personal trainer, dietician, naturopathy, reflexology

Table 5. Coefficients (95% CI) for factors determining the total cost of care and participants' utilisation of private non-medical services.

Factor	Total cost of care [^]	Utilisation of private non-medical services
Health insurance, 0 = no, 1 = yes	0.05 (-0.13 to 0.22) <i>p</i> = 0.60	0.96 (0.34 to 2.77) <i>p</i> = 0.94
Income level (AUD), (1 to 7) ⁺	-0.01 (-0.07 to 0.04) <i>p</i> = 0.60	0.83 (0.63 to 1.10) <i>p</i> = 0.20
Gender, 0 = male, 1 = female	0.09 (-0.09 to 0.26) <i>p</i> = 0.33	1.51 (0.53 to 4.35) <i>p</i> = 0.44
Pain (0 to 10)	0.000 (-0.003 to 0.004) <i>p</i> = 0.80	1.00 (0.97 to 1.02) <i>p</i> = 0.69

[^]Log transformation; ⁺1 = 0 to 6239, 2 = 6240 to 15 599, 3 = 15 600 to 25 999, 4 = 26 600 to 36 399, 5 = 36 400 to 51 999, 6 = 52 000 to 77 999, 7 = 78 000 or more

Table 6. Mean (SD) quality of life scores over time by domain.

Assessment of Quality of Life scale	Week 0	Week 4	Week 12	Week 24
Illness (0 to 9)	2.1 (1.9)	1.2 (1.7)	1.1 (1.8)	0.7 (1.6)
Independent living (0 to 9)	2.7 (2.2)	0.6 (1.1)	0.2 (0.7)	0.1 (0.6)
Social relationships (0 to 9)	1.2 (1.2)	0.7 (1.0)	0.5 (0.8)	0.4 (0.7)
Physical senses (0 to 9)	0.3 (0.7)	0.3 (0.6)	0.3 (0.6)	0.3 (0.7)
Psychological wellbeing (0 to 9)	2.4 (1.3)	1.9 (1.4)	1.4 (1.2)	1.1 (1.2)
Total (0 to 45)	8.7 (4.8)	4.8 (4.1)	3.4 (3.7)	2.7 (3.4)

investigated for utilisation of private non-medical services was significant (Table 5). The planned multivariate analysis was not performed as no significant correlations were found between the factors and outcome in the univariate analyses.

Quality of life

Participants' quality of life improved substantially over the 24 weeks by a mean of 6.1 points out of 45 (95% CI 5.2 to 6.9), from 8.7 (SD 4.8) at baseline to 2.7 (SD 3.4) at 24 weeks (Table 6). Most of the improvement occurred in the first 4 weeks. Almost all domains of quality of life were affected by ankle fracture (Figure 2). Independent living was both the domain most affected and the domain in which most improvement occurred.

Discussion

In a cohort of participants receiving physiotherapy after cast removal for ankle fracture, the total costs of ankle fracture at 24 weeks after cast removal were on average AUD 735 per person (AUD 412 in direct costs to the public healthcare system and AUD 323 in out-of-pocket costs). As well as receiving physiotherapy intervention in a public hospital outpatient setting, over 50% of the participants utilised services from a medical specialist, and around 20% also sought care from private non-medical services, most

frequently from a private physiotherapist. Neither total cost per person nor an individual's pattern of utilisation of private non-medical services could be explained by private health insurance status, income level, gender, or pain, factors which have been suggested in the literature as being associated with such variation. Participants' quality of life improved over the 24-week follow-up period with most of the improvement occurring between baseline and 4 weeks.

We collected cost and utilisation data from two perspectives: that of the Australian public healthcare system and of individual patients. This is the first study to collect such data from the perspective of individual patients, and the first to provide information on the utilisation of healthcare resources after ankle fracture. Costing was conducted as accurately as possible. We collected economic data at frequent intervals (every 4 weeks) in order to reduce recall bias, and used a combination of micro-costing (for all physiotherapy and out-of-pocket costs) and gross costing (for medical and pharmaceutical costs to the healthcare system) (Raftery 2000). Our findings are currently the best available data for planning the delivery of healthcare services in people with ankle fracture after the immobilisation period, eg, the types of services, costs, and number of visits required in the public healthcare system. However we did not collect data on costs or utilisation during the initial acute period after fracture or during the immobilisation period.

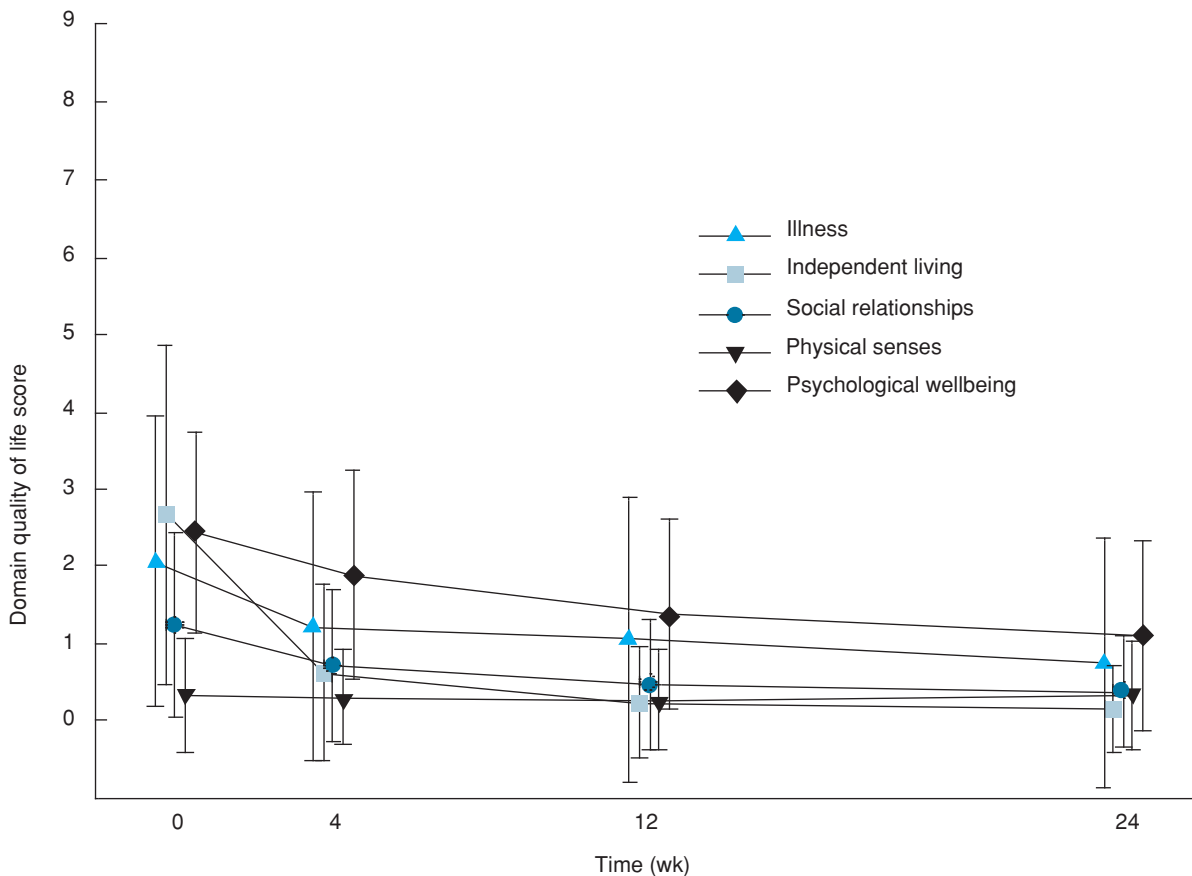


Figure 2. Mean (SD) scores for each domain (0 to 9) of the Assessment of Quality of Life scale with a higher score indicating a poorer quality of life.

We investigated the influence of socioeconomic (private health insurance, income level), demographic (gender), and clinical (pain) factors on the total cost of care and participants' utilisation of private non-medical services. We chose to investigate the factors associated with the utilisation of non-medical services in addition to receiving physiotherapy (including treatment from another physiotherapist) because such information would be of interest to physiotherapy practice. In addition, this information may provide an insight into the characteristics of patients who utilise public compared to private services (Cote et al 2001). We had anticipated that, because utilisation of private services would incur out-of-pocket treatment costs, people covered by private health insurance and those with higher incomes would tend to utilise more of these services than did non-insured, lower income individuals, hence incurring higher total healthcare expenditure. In addition, research on other musculoskeletal conditions has shown that gender and pain also influence utilisation of healthcare resources (Carey et al 1995, Carey et al 1996, Cote et al 2001, Mortimer et al 2003, Vingard et al 2002, von Korff et al 2007, Walker et al 2004, Ward and Franks 2007). Results of our study showed that only a small proportion of individuals sought additional non-medical services. It may have been that they were satisfied with the level of care provided by outpatient physiotherapy, but it is possible that they may not have been aware of alternative services. It is unlikely that participants chose not to seek additional care because of systematic barriers (ie, socioeconomic factors), as our findings suggest that neither private health insurance nor income level influenced participants' utilisation of private non-medical

services. Gender or pain also did not influence the decision behind seeking private non-medical care.

Differences between our findings and those of other studies on the determinants of costs and utilisation may partly reflect the needs of different patient populations. We investigated a population of people with an acute fracture, while other studies were conducted on people with acute or chronic back pain (Cote et al 2001, Mortimer et al 2003, Vingard et al 2002, Walker et al 2004) and other chronic pain conditions (von Korff et al 2007). To date only one other study has examined factors associated with utilisation of healthcare resources after fracture. Lubbeke et al (2005) reported that age and pre-fracture place of residence were determinants of utilisation of inpatient rehabilitation after an upper limb fracture. But the findings of this study, conducted in an elderly population, cannot be applied to most people with ankle fracture, as the peak incidences are seen in young men and middle-aged women (Daly et al 1987, Jensen et al 1998), and the average patient is middle-aged (Court-Brown et al 1998, Lin et al 2008).

The difference between our findings and findings of previous studies in utilisation of healthcare resources may also be partly due to the definition of utilisation. In other studies, utilisation was defined as patients seeking any care for their complaint (Carey et al 1995, Carey et al 1996, Cote et al 2001, Mortimer et al 2003, Vingard et al 2002, Walker et al 2004). In contrast, we selectively investigated the utilisation patterns of participants who sought other non-medical services despite already receiving outpatient

physiotherapy. Studies conducted in the United States have shown that people with health insurance incurred more healthcare expenditure and utilised more healthcare resources (Duru et al 2007, Hadley 2007, Nelson et al 2005, Ward and Franks 2007). In contrast to the situation in the United States, residents of Australia have access to a comprehensive range of healthcare services via Medicare, Australia's public healthcare system, which is free at the point of delivery. The difference in healthcare systems may also have contributed to the different relationships between health insurance cover and healthcare costs and utilisation.

The moderate sample size in our study limited the number of factors that could be investigated. We chose to explore the influence of private health insurance, income level, gender, and pain based on the results of previous studies. Our findings suggest that these factors, which have been shown to influence costs and utilisation of healthcare resources in other musculoskeletal conditions, do not have a significant influence among people attending outpatient physiotherapy after ankle fracture. Future research could investigate the influence of these factors on a wider population of people after ankle fracture (ie, not just those attending outpatient physiotherapy), or investigate the influence of other factors, such as activity limitation (Cote et al 2001, Mortimer et al 2003, Vingard et al 2002, Walker et al 2004) or comorbidities (Lubbeke et al 2005, Struijs et al 2006), on costs and utilisation of healthcare after ankle fracture. Patients receiving physiotherapy may seek additional care for different reasons, eg, they may perceive other services as adding value to physiotherapy or they may seek other services as substitutes to physiotherapy. For this reason, factors such as patient satisfaction, treatment expectations, or beliefs may also be worth exploring.

Our study provides information on the costs and utilisation of healthcare resources, and quality of life for people with ankle fracture after the immobilisation period. Such information can be used in planning health services. In contrast to the findings of previous studies in other musculoskeletal conditions, private health insurance, income level, gender or pain did not influence the costs of care to the public healthcare system or the individual patients, or the decision behind seeking care over and above publicly-provided physiotherapy in people after ankle fracture.

eAddenda: Appendix 1 available at www.physiotherapy.asn.au/AJP

Ethics: The University of Sydney Human Research Ethics Committee, Northern Sydney Health Human Research Ethics Committee, Sydney South West Area Health Service Ethics Review Committee (RPAH zone), and the St Vincent's Hospital Human Research Ethics Committee approved this study. Informed consent was gained from all participants before data collection began.

Competing interests: None declared.

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Statement regarding registration of clinical trials from the Editorial Board of *Australian Journal of Physiotherapy*

This journal now requires registration of clinical trials. All clinical trials submitted to *Australian Journal of Physiotherapy* for publication must have been registered in a publicly-accessible trials register. We will accept any register that satisfies the International Committee of Medical Journal Editors requirements. Authors must provide the name and address of the register and the trial registration number on submission.