Cost and effectiveness analysis of chiropractic and physiotherapy treatment for low back and neck pain: six-month follow-up

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Record Status
This is a critical abstract of an economic evaluation that meets the criteria for inclusion on NHS EED. Each abstract contains a brief summary of the methods, the results and conclusions followed by a detailed critical assessment on the reliability of the study and the conclusions drawn.

Health technology
Chiropractic treatment as the primary management in the treatment of patients with back or neck pain within publicly financed health care.

Type of intervention
Treatment.

Economic study type
Cost-effectiveness analysis.

Study population
Adult patients with low back or neck pain, who had no contraindications to manipulation and who had not been treated within the previous month. The exclusion criteria were as follows: showing evidence of affected nerve root (signs both on sensibility, muscle strength, and reflexes), osteopenia, or suspected infection; or having another disease, having been involved in an accident less than 10 days previously, pregnancy, or inability to understand Swedish.

Setting
Primary care. The economic study was carried out in Sweden.

Dates to which data relate
The effectiveness and resource use data were collected between March 1993 and December 1994. The price year was 1995.

Source of effectiveness data
The evidence for final outcomes was based on a single study.

Link between effectiveness and cost data
Costing was prospectively undertaken on the same patient sample as that used in the effectiveness analysis.

Study sample
Power calculations were not used to determine the sample size. From a total of 900 patients who were considered for inclusion in the study sample, a total of 38% were found to be ineligible. Another 146 patients refused to participate in the study before randomisation. Initially, 411 patients were randomly assigned to either the chiropractor group (n=219) or to the physiotherapy group (n=192); after exclusion of those who withdrew after randomisation, 323 patients participated in the trial, 179 in the chiropractor group with a mean (SD) age of 41.4 (11.6) years and 144 in the...
physiotherapy group with a mean (SD) age of 40.5 (11.9) years. The number of chiropractors who participated in the study was 6 (out of 9 private, registered chiropractors whose clinics were located in the study area) with a mean (SD) professional experience of 9.9 (8.2) years versus 30 (out of 37) physiotherapists with a mean (SD) professional experience of 10.3 (3.9) years. Two physiotherapists were excluded as they had less than one year of professional experience.

**Study design**
This was a prospective, multi-centred, randomised, controlled trial carried out in 10 primary care centres in a Swedish county. The duration of the follow-up was 6 months. The loss to follow-up was 18% in the chiropractor group versus 25% in the physiotherapy group (NS); 67 of those who were lost to follow up did not attend the first treatment session while 12 (5 in the chiropractic group and 7 in the physiotherapy group) declined to participate further after attending the first treatment session; these latter group of lost-to-follow up patients were found to be younger, more often smokers, estimated their general health lower, and had lower expectations of treatment than the patients who remained in the study sample. The patients who withdrew before treatment were found to be comparable with the study sample in terms of age, gender, and localisation.

**Analysis of effectiveness**
The principle used in the analysis of effectiveness was reported to have been intention to treat, however it appears to have been based on treatment-completers only. The primary clinical outcomes were changes in pain intensity and general health, both assessed with visual analog scale and Oswestry pain disability questionnaire (higher values indicate a higher degree of perceived problems). The other outcomes reported in the paper were response rate to first and 6-month follow-up questionnaires, sick-leave, the number and type of treatments received by patients in each study group, complications due to treatment, patients' expectations of treatment and their subjective assessment after treatment, and recurrence of the same problem. The study groups were found to be comparable in terms of background data and other characteristics except for pain intensity and general health, which were estimated to be slightly worse among patients in the physiotherapy group before treatment.

**Effectiveness results**
The effectiveness results were as follows:

No significant differences in changes in pain intensity, Oswestry scores, and general well-being could be noted between the two study groups.

The subgroup analysis (in terms of duration of current episode of pain, presence or absence of similar problems during the previous 5 years, and Oswestry score at entry of 40% or more or less than 40%) confirmed the same results with a few exceptions.

The response rate was 98% after the treatment period and 99% at 6-month follow-up.

Sick-leave rate after treatment was 17% in the chiropractic group versus 18% in the physiotherapy group; with corresponding values of 9% in the chiropractic group versus 15% in physiotherapy group at 6-month follow-up (NS). 22% of patients in the chiropractic group and 23% of patients in physiotherapy group reported having been off work for some time because of low back- or neck-related health problems after the treatment up to 6 months.

No complications due to treatment were reported from any therapist or patient.

Equal proportions, nearly 50%, of the patients in both groups reported one or several recurrences at the 6-months follow-up.

A significantly higher proportion of the patients in the chiropractic group assessed that their expectations were fulfilled after the treatment was completed.

The same group evaluated the treatment efficacy as higher, but the difference was not significant.
Clinical conclusions
The pragmatic comparisons made in this trial show a similar overall clinical outcome of treatment with chiropractic treatment or physiotherapy. The patients with acute, uncomplicated problems seemed to benefit more from chiropractic treatment in this study. On the other hand, physiotherapy seemed more beneficial to patients who had had their problems for 1 month or longer. These results are still inconclusive, however, and have to be studied further.

Measure of benefits used in the economic analysis
No summary benefit measure was adopted in the economic study, and only separate clinical outcomes were reported. Since the primary clinical outcomes were similar between the two study groups, the economic study appears to have been carried out as a cost-minimisation analysis.

Direct costs
Costs were not discounted as the time frame of the study was less than one year. Quantities were reported separately from the costs. Cost items were reported separately. The direct cost analysis covered the costs of primary treatment (including follow-up visit) (chiropractic and physiotherapy) and additional health care costs including medical attendance, chiropractic, physiotherapy, surgery and other health care (massage, naprapathy treatment performed by alternative therapists who mainly use manipulation and soft tissue treatment, x-ray or participation in a special programme for patients with long-term back problems). The perspective adopted in the direct cost analysis appears to have been that of the public health care system. The source of data on the number of treatment sessions was the therapists' reports while the source of data on all further health care utilisation was the patients' reports during the treatment and follow-up period. The sources of cost data for different services were internal accounts from different care providers. The average cost of treatment session by chiropractor was based on the mean of the estimated market price in a Swedish county, while the corresponding figure for physiotherapy was based on the statement of accounts of one large physiotherapy unit in primary care in the same county. The date of the price data was 1995.

Statistical analysis of costs
Student's unpaired t test was used to compare the study groups in terms of direct and indirect costs.

Indirect Costs
Indirect costs were not discounted as the time frame of the study was less than one year. Quantities were reported separately from the costs and cost items were reported separately. The indirect cost was based on the number of treatment sessions reported by the therapist and number of days off work reported by the patient. Only patients at work were included in the analysis of indirect costs. The perspective adopted in the analysis of indirect costs appears to have been that of society. The data on the mean income in different sex and age groups, including social costs supplied by the national statistical report published in 1994, were used to estimate the indirect costs due to absence from work. The date of the price data was 1995.

Currency
Swedish kroner (SEK). The exchange rate in March 1996 was reported to be US$1 = SEK6.80.

Sensitivity analysis
Not conducted.

Estimated benefits used in the economic analysis
Not applicable.
Cost results
The average (SD) total direct cost during the whole 6-month period was SEK2928 (3926)(range: SEK542 - SEK14,686) in the chiropractic group versus SEK2954 (5637)(range: SEK207 - SEK11,084) in the physiotherapy group. The corresponding values in terms of indirect costs were SEK12,713 (26,179)(range: SEK504 - SEK134,225) in the chiropractic group and SEK 11,123 (23,209)(range: SEK814 -SEK111,050) in the physiotherapy group.

Synthesis of costs and benefits
Costs and benefits were not combined since the treatment modalities were similar in terms of clinical and cost outcomes.

Authors’ conclusions
The authors concluded that, to reach the same result after treatment and after 6 months, the effectiveness and total costs of chiropractic or physiotherapy as primary treatment are similar.

CRD COMMENTARY - Selection of comparators
A justification was provided for the choice of the comparator (using physiotherapy). It was reported to be the established and existing treatment option at the time of the study in the Swedish health care system. You, as a database user, should consider whether this is a widely used health technology in your own setting.

Validity of estimate of effectiveness:
Despite the fact that the analysis was based on treatment completers only, the effectiveness results are likely to be internally valid due to the randomised nature of the study design and the relatively large sample size. The authors believed that the inclusion of data on the 12 patients who were lost to follow-up after attending the first treatment session would hardly change the results due to the equal drop-out rate between the two study groups and the relatively large sample size. The study sample was judged to represent a substantial proportion of all patients with low back or neck pain visiting health care despite the fact that most acute patients with non-complicated problems were excluded from the study sample because of the general practitioner’s opinion (which was that the problems would resolve themselves in a few of days without treatment). The study groups were comparable in terms of background variables but not with respect to all clinical variables. Subgroup analysis was performed to account for some of the potential confounders.

Validity of estimate of measure of benefit
The analysis of benefits was based on therapeutic equivalence of the treatment alternatives. The economic analysis therefore included only costs, and was a cost-minimisation analysis.

Validity of estimate of costs
Quantities were reported separately from the costs. Statistical analysis was performed on some of the resource use data. With respect to the perspective adopted, no important cost items appear to be omitted from the analysis. Costs were analysed statistically and were found to vary widely in both groups. Cost results may not be generalisable to other settings.

Other issues
The authors’ conclusions appear to be justified given the uncertainties in the data. The issue of generalisability to other settings or countries was not addressed, although appropriate comparisons were made with other studies. The authors do not appear to have presented their results selectively. As a comment on the study, its major limitation was deemed to have been the lack of a comparison group which received neither chiropractic nor physical therapy; which in turn made it impossible to determine whether chiropractic and physical therapy care are more effective or cost-effective than other treatments or than usual medical care alone.
Implications of the study
The authors believed that this study resulted in important information for discussion concerning the future structure and organisation of the management of patients with back problems, as well as supporting clinical decision-making for general practitioners and other providers of primary care. The authors also implied that, based on the few head-to-head comparisons of physical therapy and chiropractic care for back pain, there is no compelling scientific evidence to recommend that patients, providers, insurers, or policy makers should choose one approach instead of the other.

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