

THE EFFECTIVENESS OF WORK HARDENING FOR PEOPLE WITH CHRONIC LOWER BACK PAIN

Prepared By: Emily Connor & Kate Dyer

Date: 3 June 2010

CLINICAL SCENARIO:

Workers with lower back pain account for a societal and economic burden, Buijs, Lambeek, Koppenrade, hooftman & Anema (2009) state that lower back pain is a common problem in western societies and usually the return to work rate is good but about 10-25% of patients with lower back pain remain absent from work. The reason for selecting the topic back pain and work hardening was because it has been shown from previous experience on placement, the difficulties for clients with lower back pain in returning to work. These experiences included a range of settings such as orthopaedics, rehabilitation unit and community. Therefore it is important to find the most effective interventions. Clients and therapists alike are restricted by policy as policy dictates the number of sessions that are possible as a result it is important to use the most effective treatment. Workplaces also have policies that state the number of sick days a person can have as well as the amount of time their job can stay open. These policies have implications on the person as they will have money stress, decreased motivation, limited coping strategies for pain and psychosocial effects.

FOCUSSED CLINICAL QUESTION:

For people with lower back pain, will workplace based interventions assist with long-term return to work?

SUMMARY OF SEARCH, 'BEST' EVIDENCE' APPRAISED, AND KEY FINDINGS:

Various databases and reference lists were searched providing a lot of evidence that is available on this topic. Overall 17 articles were selected, the majority of these were then excluded because they were; not relevant, did not meet inclusion/exclusion criteria and/or because only a maximum of six articles were allowed to be identified in the search results. The results of these findings included three systematic reviews, one qualitative and two quantitative studies.

CLINICAL BOTTOM LINE:

There is some evidence indicating the effectiveness of work hardening for people with lower back pain, however it is limited and therefore further research is needed.

LIMITATION OF THIS CAT:

This critical appraisal has been peer reviewed by one lecturer as part of an assignment.

SEARCH STRATEGY:

The aim of the search was to locate articles with the best possible level of evidence on the topic of back pain and work hardening as defined by Fletcher and Sackett levels of evidence cited in Taylor (2007). A database search of CINAHL, OT Seeker, Cochrane and Pro Quest was performed using various search terms which were; back pain, back injury, work hardening, return to work, occupational therapy, rehabilitation, workplace rehabilitation and grading. A manual search of reference lists was also conducted to find additional studies.

INCLUSION AND EXCLUSION CRITERIA:**Inclusion**

- Published in English
- Was either a qualitative study, quantitative study or systematic review
- On the topic of back pain and work hardening with a focus of workplace based interventions and returning to work as an outcome
- Have an occupational focus
- Adults 18 plus

Exclusion

- Expert opinion or literature reviews
- Articles published before the year 2000
- Acute back pain

RESULTS OF THE SEARCH:

Study Design/Methodology of Articles Retrieved	Level (see Taylor, p.15)	Author (Year)
Systematic review	1	Williams, Westmorland, Lin, Schmuck, Creen (2007).
Quantitative – Randomised controlled trial	2	Lambeek, van Mechelen, Knol, Loisel & Anema (2010).
Qualitative – case study	3	Buijs, Lambeek, Koppenrade, Hooftman & Anema (2009).
Systematic review – Cochrane review	1	Schaafsma, Schonstein, Whelan, Ulvestad, Kenny & Verbeek (2008).
Systematic review	1	Carroll, Rick, Pilgrim, Cameron & Hillage (2010).
Quantitative – Randomised controlled trial	2	Steenstra, Anema, Bongers, de Vet, Knol & van Mechelen (2006).

BEST EVIDENCE:

The two articles that have been selected for critical appraisal are:

1. Lambeek, van Mechelen, Knol, Loisel & Anema (2010).

This article was chosen as it is a randomised controlled trial and one of the highest levels of research. It met all the inclusion criteria and relates well to the topic. It also provides clear and reliable research to assist in answering our clinical question.

2. Williams, Westmorland, Lin, Schmuck, Creen (2007).

This article was considered as best evidence as it is a summary of evidence from a number of studies. This article was also chosen as a systematic review is has the highest level of research apart from meta-analysis. The article was also selected because the assessment outline stated there must be different types of evidence another Quantitative study could not be chosen.

SUMMARY OF BEST EVIDENCE:

Author of article: Lambeek, van Mechelen, Knol, Loisel & Anema (2010).

Aim/Objective of the Study/systematic Review:

'To evaluate the effectiveness of an integrated care programme, combining a patient directed and a workplace directed intervention, for patients with chronic pain' (p. 1).

Study design:

Population based RCT- quantitative

Setting:

Primary care- Ten physiotherapist practices, one occupational health service and one occupational therapy practice.

Secondary care- five hospitals

Participants:

The RCT participants consisted of 134 Adults aged 18-65 years who have been sick listed for at least 12 weeks owing to back pain. 78 of these were male and 56 were female, with an average age of 45.5 years (integrated care, or 46.8 years usual care)

They will have visited an out patient clinic (mainly orthopaedics and neurology, but also rheumatology and neurosurgery) in one of the participating hospitals. The participants were in paid work (paid employment or self employed) for at least 8 hours a week and were absent or partially absent from work. Participants were excluded if they had been absent from work for more than two years; had worked temporarily for an employment agency without detachment; had specific low back pain due to infection, tumour, osteoporosis, rheumatoid arthritis, fracture of inflammatory process; had under gone lumbar spine surgery in the past six weeks or had to undergo surgery or invasive examinations within three months; had a serious psychiatric or cardiovascular illness; were pregnant; or were engaged in a lawsuit against employer.

The process of recruitment involved a letter being sent to the patient, from their specialist, within one week of visiting to inform them of the trial. They were asked to indicate whether they were interested and to check their eligibility, then return in the prepaid envelope provided. They were then contacted by phone by a research assistant and asked to give written informed consent. Patients were randomly assigned to either usual care (n=68) or integrated care (n=66).

Method:

The patients that were allocated usual care received the usual treatment from their medical specialist, occupational physician, general practitioner, and/ or allied health professionals

'The integrated care was co-ordinated by a clinical occupational physician and consisted of workplace intervention based on participatory ergonomics, and graded activity programme, which is a time contingent programme based on cognitive behavioural principles' (p. 2). The team that provided the intervention included; a clinical occupational physician, a medical specialist, an occupational therapist, and a physio therapist.

Different aspects were measured within the trial including primary outcome (return to work), secondary outcome (pain intensity and functional status) and also prognostic factors for the duration of sick leave were also included.

For the primary outcome, baselines measures were taken in the form of questionnaires and then again at three, six, nine and twelve months. Also patients reported data on sick leave which was collected every month by means of a diary and at 12 months from the databases of occupational health services. No standardised tests were stated for use on primary outcome measures.

Secondary outcomes of pain intensity were scored on a visual analogue scale, and functional status assessed with the Roland disability questionnaire.

The prognostic factors were potential psychosocial factors, measured with the job content questionnaire, and data on workload, measured with the Dutch musculoskeletal questionnaire

Results:

The results showed that the median duration until sustainable return to work was 88 days for the integrated group compared with 208 days of the usual care group. This shows a statistical significant p-value of $p=0.03$, which indicates strong evidence that an integrated care group is the more effective intervention for return to work.

After 12months the integrated care group improved significantly more on functional status ($p=0.01$). Improvement on pain did not differ between groups.

Original authors' conclusions:

The Author concludes that chronic low back pain causes problems in psychosocial and work aspects, not just clinical problems. 'Integrated graded activity with a workplace intervention reduced disability in both working and private life because of chronic low

back pain by a median of 120 days during a follow-up period of 12 months (p. 6).’ The author believes due to the research that this is an effective approach to use.

Critical appraisal:

Are the results valid?

There was a clear aim to the study ‘to evaluate the effectiveness of an integrated care programme, combining a patient directed and a workplace directed intervention, for patients with chronic pain’ (p. 1). This was then broken down into the 3 aspects of integrated care management, work related and graded activity. The study failed to identify if one of the 3 aspects had more effect on return to work than the others but the overall aim was successful.

The assignment into either the usual or integrated care groups was randomised. There was clear information on how the groups were randomised in order to keep the patients characteristics as similar as possible within the 2 groups.

There is a chart which outlines all the participants with in this clinical trial. This allows the reader to track the participants throughout the study. This starts with the original 215 patients, which was then reduced to 134 due to eligibility criteria stated earlier. The chart then shows how some participants have dropped out during the intervention stage of the trial for reasons such as; withdrew, not contactable, lost interest, questionnaire lost in mail, unhappy with treatment, recovered or death.

It was not possible to blind either the patients or the therapists in the study due to the nature of integrated activity. This may of lead to bias and the author states ‘we cannot exclude a placebo or Hawthorn effect’ (p.5). The care providers were not involved in measuring outcomes, and the questionnaires were posted out to the patients therefore the researcher and care providers would have had little impact on the responses. Also the patients were coded to ensure blinded analysis of the data by research.

The study was approved by the ethics committee, and informed consent forms were signed as soon as eligibility was established.

What are the results?

There was an adequate description of all data collection methods used and all outcome measures used in the study were referenced at the end. The analysis used is appropriate and explanation as to why some methods were used was stated, such as coding the patient’s questionnaires in order to ‘blind’ the researcher. The results showed high statistical significance between the integrated care programme and return to work ($P=0.003$). The aim of the study was to investigate the effectiveness of an integrated

care program on return to work. The study shows that there is a significant difference in the care of an integrated care programme compared to usual care.

Summary/conclusion:

Clear details were given as to the client group used within these studies, therefore the reader will know if it will work for their client group. However more specific information on the interventions used would be needed in order to duplicate this study or use it in practice. There also needs to be further research into whether one aspect of the integrated intervention has a better outcome than others.

Author of article: Williams, Westmorland, Lin, Schmuck & Creen (2007).

Aim/Objective of the Study/systematic Review:

The aim of the study was to evaluate the effectiveness of workplace-based rehabilitation intervention for injured workers with lower back pain. The review focused on studies where interventions happened at the workplace as well as studies that involved secondary prevention interventions.

Study design:

Systematic review

Search strategy:

The author identified that four data bases were searched; these were MEDLINE, CINAHL, EMBASE and AMED. The abstracts obtained from the search terms were independently assessed by five reviewers. If there was doubt whether the article met the criteria the full article was retrieved. The reviewers also scanned the references and retrieved articles for additional studies.

Articles reviewed:

A total of 15 from 1,224 articles were of sufficient quality to be included in the systematic review. Of the 15 articles, there were 10 studies that evaluated the effectiveness of workplace rehabilitation interventions in the treatment of lower back pain.

Participants:

For the systematic review, articles were included if participants of the studies were employees with work-related musculoskeletal lower back pain injuries. The number of participants varied depending on the study. Subjects in the studies included nurses, goldsmiths and mechanical and electrical supervisors.

Method:

Each article was independently read by two pairs of reviewers using the Evaluation Guidelines for Rating the Quality of an Intervention Study. The articles were summarised in a table showing type of participants, interventions and evaluations used and results from the study.

Results:

The results show that the best evidence was clinical interventions with occupational interventions, as well as early return to work/modified work were effective in returning workers to work faster, reducing pain and decreasing the rate of back injuries.

Ergonomic interventions were also found to be effective workplace interventions.

Exercisers and workplace visit and supervisor involvement for return to work interventions were the other two interventions used in the systematic review. According to the Evaluation Guidelines a quality score of 48 is the best possible score. Eight articles achieved a score of 32 or higher, this indicates medium to high quality of research findings. Five articles had medium quality ratings which is a score of 32-37, one article had the high quality rating of 42 and very high ratings occurred in two articles with a score of 47.

Original authors' conclusions

The author concludes that there is some evidence on the effectiveness of workplace rehabilitation interventions for injured workers with lower back pain. The findings are useful as they can assist in making decisions and policies about workplace interventions for lower back pain. Further quality studies are required on workplace interventions to promote early and safe return to work. Even though workplaces may not be the best setting for controlled interventions it is important as it will increase the quality of these studies. "The need for further research in this area is necessary to reduce the burden of back pain on employees and their families, employers and the health care system" (p. 622).

Critical appraisal:**Are the results valid?**

Taylor (2007) suggests a number of criteria should be met in order for a systematic review to be valid. This review meets the criteria as follows. The systematic review focus had been clearly defined; studies were gathered from a range of databases and a manual search of references (citation tracking) was also conducted, a good range of applicable studies were selected with a list of all the key terms used to locate the studies. The reviewers established a clear inclusion and exclusion criteria and the level of evidence for each study was recognised using the Evaluation Guidelines for Rating the Quality of an Intervention Study and was independently reviewed by two pairs of reviewers.

What are the results?

Taylor (2007) also suggests a number of criteria the reader needs to consider when appraising the results of the systematic review. The overall result of the review does address the research purpose. The results were explained under different categories and the characteristics were summarised in a table which provides the reader with a clear overview of the results. The author accurately interpreted the conclusions and recommendations and these are based on the findings in the research.

How will these results help me work with my clients?

Taylor (2007) suggests a number of issues to consider when making a decision if the review will be of assistance in practice. The review relates to a specific area of practice therefore the results are only relevant to a select number of therapists. The reviewers reviewed 10 different studies within the 15 articles in the systematic review therefore a number of outcomes were considered. All studies were listed in a table under different categories, this means it is easy for the occupational therapist to identify studies that are relevant to their setting. The cost-benefit relationship was not discussed in the review but is one of the recommendations for future study.

Summary/conclusion:

Taylor's questions for critically appraising were used to appraise this systematic review. The results of the systematic review are considered valid and the data is appropriately analysed in a way that is easy to follow for the reader. The relevance to occupational therapy is specific to certain settings, therefore is only beneficial to some occupational therapists.

IMPLICATIONS FOR PRACTICE, EDUCATION AND FUTURE RESEARCH:

Workplace based interventions are commonly used within New Zealand. It is essential that undergraduates, new graduates and experienced occupational therapists alike, who work within this area of practice, continue to upgrade their knowledge through the use of education.

Workplace based intervention will have an effect on the workplace and other employee's. This is an implication for occupational therapy practice as it can impact on what treatment the occupational therapist can offer. Neither of the studies takes into account the work environment. The cost benefit was not discussed in the studies. Williams, Westmorland, Lin, Schmuck & Creen (2007) recommend that the cost benefit should be incorporated in future research. This would be beneficial to use as evidence for future practice.

Both of the studies show that there is some evidence indicating workplace based interventions are effective for patients with lower back pain in order for them to return to work. However through the critical appraisal of the articles it has been noted that there are some implications to practice and research. Both studies state that further research is required to provide more reliable and specific research.

Lambeek, van Mechelen, Knol, Loisel & Anema (2010) state that further research could use a factorial design in order to assess the effectiveness of individual components of integrated care intervention. Williams, Westmorland, Lin, Schmuck & Creen (2007) revealed that more rigorous research on workplace intervention for lower back pain is needed. Positive findings identified in the review should be confirmed by future studies that include randomised controlled designs, standardised outcome measures and appropriate description of interventions and the statistical analysis. Further research needs to be conducted relating to all areas of lower back pain including; acute, sub-acute and chronic pain. This is to ensure workplace based interventions are effective in all areas of back pain.

Another implication to research shown in the studies critically appraised, is no qualitative research was used. Therefore there is no insight into the effective components in the interventions of either the health care professional, the clients or the employer. Although further research would be more effective, occupational therapists working with this client group could use the current research in conjunction with their clinical judgement.

The articles can be trusted as they both have a high level of evidence. These levels were level one for Williams, Westmorland, Lin, Schmuck & Creen's (2007) study and level two for Lambeek, van Mechelen, Knol, Loisel & Anema's (2010) study. Based on these two studies it is not recommended that changes are needed to the way we practice in New Zealand. This is due to New Zealand occupational therapists are already using workplace based interventions in their practice. Even though changes are not recommended further research would be beneficial within New Zealand.

REFERENCES:

- Buijs, P.C., Lambeek, L.C., Koppenrade, V., Hooftman, W., & Anema, J.R. (2009). Can workers with chronic back pain shift from pain elimination to function restore at work? *Journal of Back and Musculoskeletal Rehabilitation*, 22, 65-72.
- Carroll, C., Rick, J., Pilgrim, H., Cameron, J., & Hillage, J. (2010). Workplace involvement improves return to work rates among employees with back pain on long-term sick leave: a systematic review of the effectiveness and cost-effectiveness of interventions. *Disability and Rehabilitation Journal*, 32 (8), 607-621.
- Lambeek, L.C., van Mechelen, W., Knol, D.L., Loisel, P., & Anema, J.R. (2010, April). Randomised controlled trial of integrated care to reduce disability from chronic low back pain in working and private life. *British Medical Journal*, 340. Retrieved 31 May, 2010, from http://www.bmj.com.ezproxy.otago.ac.nz/cgi/reprint/340/mar16_1/c1035.
- Schaafsma, F., Schonstein, E., Whelan, K.M., Ulvestad, E., Kenny, D.T., & Verbeek, J.H. (Updated December 26, 2008). Physical conditioning programs for improving work outcomes in workers with back pain [Cochrane Review]. *Cochrane Database of Systematic Reviews* 2010 (1). Retrieved May 1, 2010 from The Cochrane Library, Wiley Interscience.
- Steenstra, I.A., Anema, J.R., Bongers, P.M., de Vet, H.C.W, Knol, D.L., & van Mechelen, W. (2006). The effectiveness of graded activity for low back pain in occupational health care. *Journal of Occupational and Environmental Medicine*, 63, 718-725.
- Taylor, M.C. (2007). *Evidence-based practice for occupational therapists* (2nd ed.). United Kingdom: Blackwell Publishing.
- Williams, R.M., Westmorland, M.G., Lin, C.A., Schmuck, G., & Creen, M. (2007). Effectiveness of workplace rehabilitation interventions in the treatment of work-related low back pain: A systematic review. *Disability and Rehabilitation Journal*, 29(8), 607-624.