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International Clinical Guidelines at the American University of Beirut, Physical Therapy Department: Strategy of Implementation and Evaluation

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ABSTRACT

Purpose. The purpose of the study is (1) to describe the selection process of an international clinical guideline (CGL) for patients with low back pain (LBP) for adoption and implementation at the Physical Therapy Department at the American University of Beirut Medical Center (AUBMC), and (2) to evaluate the physiotherapists' compliance. **Method**. International guidelines were identified through a literature search and compared according to the AGREE instrument for selection. Quality indicators were selected. Physiotherapists were educated about guidelines' benefits and the content of the adopted guidelines during interactive sessions; patients' files were optimized and audited in order to evaluate compliance. **Results**. Out of six guidelines for LBP, we selected that of the Royal Dutch Association of Physiotherapy. Full adherence of physiotherapists to the educational sessions was noted. A total of 72 patient files were available. However, only 23 out of 72 files (32%) were complete to test the therapists' adherence to the new assessment forms using 13 quality indicators. A high level of compliance with a mean score of 90% was recorded for the diagnostic process indicators, and a low level for the mean score of therapeutic process indicators (42%) except the indicator for the advice to stay active (100%). The mean score for the outcome of care was very low (13%). **Conclusions.** Dutch guidelines for low back pain were selected for adoption and implementation. A relatively high level of adherence to guidelines recommendations was noticed in the diagnostic process and a low level in the therapeutic process.

INTRODUCTION

The ultimate goal of evidence-based practice (EBP) is improving the process and the consistency of care such as decreasing the variation of practice and improving patient's outcome.[1] Implementation of clinical guidelines (CGL) is one way of achieving EBP. However, the literature has identified barriers to implementation related to the characteristics of guidelines to be introduced, mainly clarity and applicability, characteristics of patients (comorbidities reduce the chance to follow CGL), and physiotherapists (knowledge and acceptability of CGL) who need to change, and characteristics of organizations or environment (i.e. lack of

support from superiors) in which the change will occur as well as patients' preferences, expectations, and behavior.[2-5] On the other hand, facilitators include integrating CGL recommendations into training material, motivation of health professionals, their perception that practicing shared decision-making with patients will lead to a positive impact on clinical processes and better patient outcomes.[4,6,7] The physical therapy department (PTD) at The American University of Beirut Medical Center (AUBMC) started the process of quality improvement with CGL implementation. The population of patients with low back pain (LBP) was selected due to the prevalence of this condition locally; LBP outpatients' volume referred to the PTD accounts for 24% of the total referrals.

The objective of this study was twofold: (1) describe the selection process of a CGL for LBP suitable for implementation in the AUBMC and (2) evaluate the therapists' compliance with the implementation of the selected CGL and the quality of care as measured by preselected quality indicators (QI) from the CGL in LBP.

METHOD

Five steps were followed for a systematic adaptation and implementation process.[8] Step I, the selection of guidelines to be implemented. Step II, the selection of quality indicators (QI) based on the selected CGL. Step III, controlling the expected barriers by mainly educating physiotherapists about EBP and selected CGL in LBP applying the model developed by Grol et al; this model delineates five stages including several interventions, described in table 1.[9,10] Step IV, was changing patients' management related to assessment and treatment. Step V, was the evaluation of the level of the compliance of the PTs to the implementation process by the audit of patients' files.

Table 1: Strategy to be Followed by Health Professionals for Behavioral Change [9]

Stages	Interventions
1) Orientation	
Inform physiotherapists	Introduction of evidence-based practice and clinical practice guidelines
Promote awareness of clinical guidelines	Distribution of clinical practice guidelines in low back pain and discussion
2) Insight	
Create understanding	Explain guidelines
Provide insight into current management	Simulate clinical and educational activities Regular repetition
3) Acceptance	
Develop positive attitude	Include clinical practice guidelines recommendations in patients' assessment forms
4) Change	
Change clinical practice and patient's behavior	Use modified assessment forms for clinical practice and enhance critical thinking Change patient education material to fit evidence based practice
5) Maintenance of change	
Integrate change in daily routine	Evaluate adherence in daily practice Monitor, send reminders, provide feedback

Selection of the Guidelines (Step I)

A search on Medline, PubMed, Cochrane Library, and Physiotherapy Evidence Database (PEDro) sites was conducted. Keywords used were clinical guidelines AND low back pain, non specific low back pain (NSLBP), acute low back pain, and chronic low back pain. Inclusion criteria were 1) guidelines developed between the years 1995 and 2005, 2) guidelines written in English to eliminate the need for translation (scientific language in the hospital is English), 3) guidelines describing physiotherapy diagnostic and therapeutic processes, 4) guidelines with description of recommendations based on level of evidence. Exclusion criteria were guidelines not focusing on physical therapy, such as manual therapy, and guidelines that do not meet all items on the "Appraisal of Guidelines for Research and Evaluation" instrument (AGREE).[10] This instrument assesses the quality of guidelines development, content, and recommendations but does not assess patient's outcome.[10] The selection process was rigorous using a valid instrument (AGREE Instrument) ensuring the quality of their content and presentation and that CGL recommendations are based on the best available evidence.[7] The traced guidelines were assessed, as recommended by the

Agree instrument, by two independent appraisers who compared them to the six domains of the AGREE instrument as described in table 2.

Selection of Quality Indicators (Step II)
Quality Indicators (QI) are specific and measurable elements of practice that can be used to assess the quality of care and as tools to promote improvement.[11,12] Twenty seven QI for the diagnostic and the therapeutic processes were identified and selected by the Dutch physiotherapists and adopted by the department.[13]

Controlling Expected Barriers (Step III)
1- Prepare Physiotherapists
The PTD director introduced the therapists to the sequence of guidelines implementation; a general introduction on EBP and CGL impact on physical therapy (PT) quality services were presented during one hour.[11,12,14,15] The physiotherapist specialized in the rehabilitation of spine-related disorders was assigned as a project leader and presented CGL in patients with LBP during weekly group meetings during one month for a total of six hours. Explanation of assessment tools and treatment plan was performed; additionally, simulation of patients' assessment, treatment, and education activities enhancing critical thinking and clinical reasoning to facilitate guidelines acceptance, adoption, and implementation of change were also carried out.[9] Maintenance of change was enhanced by auditing patients' files reflecting therapists' change.

2- Educate Patients
Patient educational materials were modified to include evidence-based information in simple language; materials were explained and distributed to patients.

3- Get Stakeholders approval
The implementation project was presented to the hospital administration and to the quality improvement office for approval as part of the department's quality improvement activities.

Changing Physiotherapists' Behavior (Step IV)
Patients' assessment forms, included in patients' files, were modified to include guideline recommendations and facilitate the incorporation of new practice into existing practice. Most modifications focused on the addition of questions where therapists could answer by "yes" or "no."

Modifications involved patient history-taking to exclude red flags rather than checking comorbidity and finding physical causes to LBP; pain assessment on the Visual Analogue Scale (VAS) serves to define the course of symptoms and evaluate patient coping strategy; assessing lumbar spine mobility and stability identifies impairment of musculoskeletal functions. The neurological assessment is restricted to patients with lumbosacral radiculopathy. The "Quebec Back Pain Disability Scale" (QBPDS), a self appraised questionnaire, was translated to Arabic in order to allow non-English speaking patients to complete the form. QBPDS Arabic version psychometric properties were evaluated according to two phases. The first phase was the translation and back translation effected by 10 therapists from the team and outside AUBMC. The second phase was the distribution of the questionnaire to 16 bilingual patients. Agreement between Arabic and English versions showed a high correlation coefficient of 0.95 on Spearman's test.

Aiming at assessing the gain in PTs' knowledge, a five point Likert scale questionnaire, ranging from strongly agree (score 5) to strongly disagree (score 1), was distributed to the seven physiotherapists including five questions related to the implementation strategy efficiency, guidelines clarity and applicability, flowchart efficiency as a reminder, and gain in physiotherapy knowledge.

Evaluation of CGL Implementation Strategy (Step V)
To evaluate the implementation strategy, patient files were audited based on the preselected explicit and transparent quality indicators.[14]

RESULTS
Selection of LBP guidelines (Step I)
The search yielded six guidelines for LBP: European guidelines for the management of acute non-specific low back pain in primary care, European guidelines for the management of chronic non-specific low back pain, European guidelines for prevention in low back pain, New Zealand acute low back pain guide, acute low back pain interdisciplinary clinical guidelines developed by the Norwegian back pain network, and the national practice guidelines for physical therapy in patients with low back pain developed by the Royal Dutch Association of Physiotherapy (KNGF).[16-21] Other national guidelines were available in

the search but full version was not accessible because it was required to be member of the national physiotherapy association like the American Physical Therapy Association and the Chartered Society for Physiotherapy.

Dutch guidelines were selected because they were physiotherapy specific with diagnostic and therapeutic processes and outcome measurements clearly highlighted; they scored positive in all AGREE instrument domains with the two appraisers (Table 2) marking a narrow difference of scores between them. Additionally, Dutch guidelines include a flowchart that summarizes the clinical process.

Table 2: Comparison of International Guidelines for Low Back Pain Content to the Six Domains of the AGREE Instrument.

AGREE Instrument	EuA	EuC	EuP	KNGF	Norv	NZ
Scope & Purpose (Standardized Domain Score)	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
Overall objectives of guideline specifically described	+	+	+	+	+	+
Clinical question covered by guideline specifically described	+	+	+	+	+	+
Patients to whom guidelines apply specifically described	+	+	+	+	+	+
Stakeholders Involvement (Standardized Domain Score)	**54%**	**54%**	**54%**	**95%**	**75%**	**83%**
Guideline development group from all relevant professional groups	+	+	+	+	+	+
Patients' views and preferences sought	- *	- *	- *	+	+	+
Target users of guideline clearly defined	+	+	+	+	+	+
Guideline piloted among target users	- *	- *	- *	+	+	+
Rigour of Development (Standardized Domain Score)	**95%**	**76%**	**80%**	**100%**	**88%**	**88%**
Systematic methods used to search for evidence	+	+	+	+	+	+
Criteria for selecting evidence clearly described	+	+	+	+	+	+
Methods for formulating recommendations clearly described	+	+	+	+	+	+
Health benefits, side effects and risks considered in formulating recommendations	+	+	+	+	+	+
Explicit link between recommendations and supporting evidence	+	+	+	+	+	+
Guideline externally reviewed by experts	+	-	+	+	+	+
Procedure for updating the guidelines provided	+	A	A	+	+	+
Clarity & Presentation (Standardized Domain Score)	**95%**	**76%**	**80%**	**100%**	**88%**	**88%**
Recommendations specific and unambiguous	+	+	+	+	+	+
Different management options of condition clearly presented	+	+	+	+	+	+
Key recommendations easily identifiable	+	+	+	+	+	+
Guideline supported with tools for application	-	-	-	+	+	+
Applicability (Standardized Domain Score)	**33%**	**33%**	**33%**	**83%**	**72%**	**55%**
Potential organizational barriers discussed	- *	- *	- *	+	+	+
Potential cost implications considered	- *	- *	- *	+	+	+
Guideline presents key review criteria for monitoring and/or audit purposes	-	-	-	+	+	A
Editorial Independence (Standardized Domain Score)	**100%**	**100%**	**100%**	**100%**	**91%**	**58%**
Guideline editorially independent from the funding body	+	+	+	+	+	+
Conflict of interest of guideline development members recorded	+	+	+	+	+	-
Specific Physical Therapy **	-	-	-	+	-	-
Flow Chart Available **	-	-	-	+	-	+

- ***Abbreviation:*** *AGREE: Appraisal of guidelines for research and evaluation.[10] EuA: European guidelines for the management of acute low back pain in primary care; EuC: European guidelines for the management of chronic non-specific low back pain; EuP: European guidelines for prevention in low back pain; KNGF: Royal Dutch Association of Physiotherapy in the Netherlands; Norv: The Norwegian Back Pain Network; Acute low back pain. Interdisciplinary clinical guidelines; NZ : New Zealand acute low back pain guide.[16-21]*
- ***+:*** *the checked guidelines scored positive.* ***-:*** *the checked guidelines scored negative.* ****:*** *Items highlighted by the developing group as lacking due to the scope of the guidelines developed.* ***A****: item not clearly expressed by the guideline developers.* *****:*** *Items not related to AGREE instrument.*

Selection of Quality Indicators (Step II)

Thirteen QI out of the available 27 were selected based on those identified by Dutch physiotherapists and derived from the guidelines recommendations. Discussions among the therapists' team led to the selection of these 13 QI; those selected were

considered delineating the most prominent changes in the clinical diagnostic and therapeutic processes between the routine and the recommended new practice as detailed in table 3.[14]

Table 3: Selected Quality Indicators

Assessment Process (n=8)	-Pain duration -Exclusion of red flags and identification of yellow flags -Patient coping strategy -Identification of impairments of neuromusculoskeletal functions -Identification of activities limitation -Identification of participation problems -Patient functioning using QBPDS -Pain using VAS
Treatment Process (n=5)	-Prescribing exercises only - Advice to stay active - Providing ≤ 3 sessions -Improvement in patient functioning on QBPDS -Improvement in pain intensity on VAS-P

Abbreviation: QBPDS: *Quebec back pain disability scale;* ***VAS-P****: visual analogue scale for pain.*

Controlling Expected Barriers (Step III)

1- Prepare Physiotherapists

The seven physiotherapists attended all education sessions and participated in the discussions. Results of the questionnaire distributed to the therapists revealed that all found the strategy of implementation efficient, and CGL clear and applicable; six out of seven (85%) found the flowchart efficient as reminder, and all strongly agreed that guidelines updated their knowledge and changed their approach to patients' assessment and treatment. They all found CGL supporting their specialty and constituting a significant component of their continuing professional development.

2- Patients Expectations and Preferences

Physiotherapists were unexpectedly faced by patients' resistance to be treated by exercises only and by their insistence on receiving heat therapy and massage. Patients were influenced by the physician's opinion and written prescription.

3- Educate Patients

Patients expressed their satisfaction with the education material availability verbally and considered it as reference.

4- Get Stakeholders Approval

The Hospital Administration and the Quality Improvement Office approved the project specifically that it did not incur financial burden; they acted as facilitator agent.

Changing Physiotherapists' Behavior (Step IV): Evaluation of Their Compliance with the change.

Changes were mainly operated in the diagnostic and therapeutic processes. Patients' assessment forms were modified to incorporate the selected QI.

Evaluation was performed 10 months after the implementation process started. All files of patients treated for NSLBP were audited by the therapist specialized in spine related problems to check physiotherapists' adherence to guidelines using the 13 selected QI. A total of 72 files were audited for the period of October 2007, date of implementation, until July 2008. Forty-six files (64%) were completed on the old assessment forms and 26 (36%) used the new assessment forms; out of the 26, three were excluded for incomplete documentation which makes the overall compliance with the new forms 23 out of 72 (32%).

Evaluation of Implementation Strategy (Steps V)

Compliance to guidelines recommendations varied largely between assessment and treatment activities. All 23 files reported assessment of pain duration. All 23 patients were screened for red and yellow flags; most patients were assessed for impairments of neuromusculoskeletal functions, participation problems, and coping strategy, but activities limitations were tested in only 65% of the patients. All patients were educated about exercises and proper activities of daily living (ADL) with advice to stay active. However, in most cases electrotherapy and ultra sound treatment modalities were used (92%) in addition to exercises; only 8% of the patients were treated with exercises and advice only as recommended by the CGL. As for the number of treatment sessions attended, only three patients (13%) received one session as advocated by the CGL, whereas the median

number of sessions per patient was seven ranging between one and eighteen sessions (Table 4). QBPDS was completed by 17 patients (74%) during initial evaluation. The final assessment based on QBPDS was not completed by any of the 23 patients; instead, patients' functional outcome was documented in the discharge summary using a non-standardized reporting stating that all patients were independent in ADL. The pain intensity tested on the VAS was reported in all 23 patients on the initial assessment and in only six patients on the final assessment (Table 4). In the remaining 17 patients, the post treatment pain intensity was reported as a percentage of pain relief.

Table 4: Evaluation of Therapists' Compliance with Clinical Guidelines in Patients with Low Back Pain (n=23)

Initial Assessment as per Guidelines Recommendations (QI n=8)	**Physical Therapists' Compliance**	
	n	**(%)**
Assessment of pain duration	23	(100)
Identification of red and yellow flags	23	(100)
Identification of patient's coping strategy	22	(96)
Identification of impairments of neuromusculoskeletal functions	22	(96)
Identification of activities limitation	15	(65)
Identification of participation problems	21	(91)
Initial Assessment of functioning based on QBPDS	17	(74)
Initial assessment of intensity of pain on VAS	23	(100)
Mean compliance to QI of initial assessment		**(90)**
Treatment as per Guidelines Recommendations (QI n=3)		
Exercises only	4	(8)
Advice to stay active	23	(100)
Providing ≤ 3 sessions	4	(17)
Mean compliance to QI of treatment		**(42)**
Outcome of Care (QI n= 2)		
Final assessment of functioning based on QBPDS	0	(0)
Final assessment of intensity of pain on VAS	6	(26)
Mean compliance to outcome of care		**(13)**

Abbreviations: QI: *quality indicator****; LBP****: Low back pain;* ***QBPDS****: Quebec Back Pain Disability Scale;* ***VAS****: Visual Analogue Scale.*

DISCUSSION

This is the first study focusing on implementation of CGL in patients with LBP performed in Lebanon and in the region**.** It studied the possibility of adapting and implementing translated Dutch guidelines for LBP in the PTD at AUBMC. In our study, 32% compliance with the new forms was recorded. As for the adherence to guidelines recommendations, the lowest scores registered were for the treatment of patients (42%) and for the final assessment of patients' outcome (13%), and the highest scores of compliance recorded were for initial assessment of patients (90%) as per guidelines recommendations. Our results match the feedback of the physical therapists who found that the strategy of implementation was efficient, and that the guidelines updated their knowledge and changed their approach to patient's assessment. However, change was more difficult to implement in the areas of treatment and assessment of outcome as per guidelines. In the diagnostic phase, the questions in the patient file were type answers "yes" or "no". In the assessment of patients, the physiotherapist is more autonomic in choosing his approach. In contrast, the selection of treatment modalities requires a closer interaction between the patient and the treating physician on one hand and the physical therapists and the patient on the other hand, because patients and physicians have their own "beliefs" in what is good for the recovery.

According to the literature, physicians disagree with guidelines recommendations due to lack of applicability or lack of evidence; patients in our culture mix physiotherapy with massage and expect to receive it as curative therapy, influenced by their physician.[5] A closer interaction leads to complementary treatment and prevents contradictory information to patients. Our results compare favorably with the results of an implementation study in the Netherlands. Swinkels et al found that most of the treatment episodes in NSLBP, treatment goals, and interventions were not in complete agreement with guidelines recommendations.[22] In accordance to what was previously published in the literature, our study found that patients' preferences may be a significant barrier to the implementation of evidence based CGL.[3,22-27] We hypothesize that these expectations and preferences were mainly influenced by physicians' prescriptions and patients' perception of physiotherapy care which leads us to think that to achieve a more extensive implementation, the early steps of the implementation process (steps I through III) should include members from all the disciplines involved in patients' care in order to achieve the necessary change in professional behavior at a wider level

and decrease the discrepancy between the approach of physical therapists and physicians. Interdisciplinary education should be enhanced where the different aspects of care specific to each discipline are shared to prevent contradictory information to patients and promote continuity of care.[24,26-28] There is also a need to educate patients about the effectiveness of their active participation in the rehabilitation process, and on the scope and role of each health care discipline in improving their health condition. Such activity could be performed individually during the treatment session on a one-to-one basis by distribution of printed material, through emails which have been shown to be cost-effective in disease prevention and health promotion, and through mass media as well.[26,28-32]

Three specific areas with very low adherence rates were identified: the number of sessions, treatment with exercise therapy only, and the final assessment of patients' outcome. The number of sessions attended showed a discrepancy with guideline recommendations. Compared to previous practice, this number reflects a significant improvement where the average number of sessions in our department was 12. Guidelines recommend the limitation of the number of treatment sessions in patients with a normal course of low back pain but do not recommend any number for patients with chronic pain.[32] It is possible that this expanded number of sessions is due to the fact that physiotherapists did not have clear guidance in this area. It is only recently that guidelines for LBP of the National Institute for Clinical Evidence (NICE) recommended a total number of eight sessions for chronic patients, where the core treatment is exercises only, expanded over twelve weeks.[33] Our study showed also that physical therapists were still focusing on pain relief instead of concentrating on patients' functioning for the recovery as recommended by the guidelines, which probably explains the extensive use of physical modalities of treatment.

In addition, the final assessment for the QBPDS and VAS was poorly performed in our study. Files were lacking assessment and categorization of impairments of neuromusculoskeletal functions, activity limitation, and participation problems. The poor understanding of the change, despite the therapists' claim while answering the questionnaire that guidelines changed their perception and approach to LBP management, and the lack of time were identified as barriers to implementation. Also, the poor compliance of physical therapists with the new forms (32%) was related to time constraints; only the old forms were available in the trays at the beginning of the study and the heavy work load did not allow physiotherapists to look for the new forms. Our results are in accordance with previous results where the similar barriers were identified. Bekkering and Swinkels found that discrepancy between guidelines, recommendations, and current practice is due mainly to therapists' knowledge and patients' preferences, Leemrijse found it related to the therapists, while American physical therapists identified time as the primary barrier to implementing EBP. [3,5,23,35-38] This implies the need for tailoring more educational sessions to cover areas with poor compliance and to provide physiotherapists with a working environment where time constraints are minimized. This also implies the need, as stated earlier, for patient education.

The limitation of the study is its application on a small number of therapists (seven) and patients, which does not allow for results inference. But we learned that clarifying the new concepts for PTs such as the difference between normal and abnormal course of low back pain symptoms, yellow and red flags, patient's coping strategy, and training on a time contingent plan is critical for setting the physiotherapy diagnosis and clinical triage; it is also necessary to focus on correct patients' files documentation skills leading to complete patients records. Furthermore, educating patients about the role of physiotherapy in the management of their condition and their active role in the rehabilitation process is crucial for a smooth and correct guidelines implementation. Finally, direct communication with the referring physician and education of physicians about the content of guidelines helps to ease the implementation process and prevent providing patients with contradictory information.

In conclusion, the English version of the Dutch CGL for LBP was selected for adoption and implementation based on the AGREE instrument. This implementation was achieved with an acceptable adherence level for initial assessment but not for treatment adherence to guidelines and the outcome of care. Only 23 out of 72 files were complete to test the therapists' compliance with the new assessment forms. Thirteen QI were used for the test reflecting the changes in the clinical process. A relatively high level of compliance was recorded for the diagnostic process and a much lower level for the therapeutic process and for the outcome of care with the exception of the advice to stay active.

REFERENCES

1. Woolf SH, Grol R, Hutchinson A, et al. Clinical Guidelines: potential benefits, limitations and harms of clinical guidelines. *BMJ*. 1999;318:527-530. Review
2. Foy R, Walker A, Penney G. Barriers to clinical guidelines: the need for concerted action. *Br J Clin Govern*. 2001; 6(3);166-174.
3. Francke AL, Smit MC, de Ver AJE, et al. Factors influencing the implementation of clinical guidelines for health care professionals: A systematic meta-review. *BMC Med Inform Decis Mak*. 2008;8:38. doi:10.1186/1472-6947-8-38.

4. Légaré F, Gravel K, Ratté S, et al. Barriers and facilitators to implementing shared decision-making in clinical practice: a systematic review of health professionals' perceptions. *Patient Educ Couns*. 2008;73(3):526-535.
5. Lugtenburg M, Zegers-van Scaick JM, Westert G P, et al. Why don't physicians adhere to guideline recommendations in practice? An analysis of barriers among Dutch general practitioners. *Implement Sci.* 2009;4:54. doi: 10.1186/1748-5908-4-54.
6. Colón-Emeric CS, Lekan D, Utley-Smith Q, et al. Barriers to and facilitators of clinical practice guideline use in nursing homes. *J Am Geriatr Soc.* 2007;55(9):1404-1409.
7. Schünemann HJ, Fretheim A , Oxman AD. Improving the use of research evidence in guidelines development: 10. Integrating values and consumer involvement. *Health Res Policy Syst.* 2006;4:22. doi: 10.1186/1478-4505-4-22.
8. Fervers B, Burger JS, Haugh MC, et al. Adaptation of clinical guidelines: literature review and proposition for a framework and procedure. *Int J Qual Health Care*. 2006;18(3):167-176.
9. Grol R, Wensing M. Selection of strategy. In: Grol R, Wensing M, Eccles M. *Improving Patient Care. The Implementation of Change in Clinical Practice*. Edinburgh: Elsevier Limited; 2005:122-134.
10. Appraisal of guidelines for research and evaluation. The AGREE Instrument. The AGREE Collaboration 2003. Website: www.agreecollaboration.org. Accessed on June 15, 2008.
11. Oxman A, Schünemann HJ, Fretheim A. Improving the use of research evidence in guideline development: 16 Evaluation. *Health Res Policy Syst.* 2006;4:28. doi:10.1186/1478-4505-4-28.
12. Campbell SM, Braspenning J, Hutchinson A, et al. Research methods used in developing and applying quality indicators in primary care. *Qual Saf Health Care*. 2002 a; 11(4):358-364.
13. Rutten GM, Degen S, Hendriks HJM, Braspenning JC, Harting J, Oostendorp RAB. Adherence to clinical practice guidelines for low back pain in physiotherapy: do patients benefit? *Physical Therapy*. 2010;90(8):1111-22.
14. Schünemann HJ, Oxman AD, Fretheim A. Improving the use of research evidence in guideline development: Determining which outcomes are important. *Health Res Policy Syst*. 2006; 4:18. doi:10.1186/1478-4505-4-18.
15. Herbert R, Jamtvedt G, Mead J, et al. *Practical Evidence- Based Physiotherapy*. Edinburgh. Elsevier, Butterworth-Heinemann. 2005.
16. Van Tulder M, Becker A, Bekkering T, et al. Low Back Pain In Primary Care. On behalf of the COST B13 Working Group on Guidelines for the management of acute low back pain in primary care. November 2004. www.backpaineurope.org Accessed on July 12, 2006.
17. Airaksinen O, Brox JI, Cedraschi C, et al. On behalf of the COST B13 Working Group on Guidelines for Chronic Low Back. European guidelines for the management of chronic non-specific low back pain. November 2004. www.backpaineurope.org Accessed on July 18, 2006.
18. Burton AK F, Balagué G, Cardon HR, et al. European guidelines for prevention in low back pain. November 2004; On behalf of the COST B13 Working Group on Guidelines for Prevention in Low Back Pain. www.backpaineurope.org Accessed on July 12, 2006.
19. New Zealand acute low back pain guide. 2004. Prepared by ACC and endorsed by New Zealand guidelines group. www.nzgg.org.nz Accessed on July 24, 2006.
20. The Norwegian Back Pain Network- The communication unit. Acute low back pain. Interdisciplinary clinical guidelines. Oslo, 2002. The Norwegian Back Pain Network. www.ifomt.org Accessed on July 24, 2006.
21. Bekkering GE, Hendricks HJM, Koes BW, et al. National practice guidelines for physical therapy in patients with low back pain. *Dutch Journal of Physiotherapy* 2005;115(Suppl):1-40.
22. Swinkels ICS, Ende van den CHM, van den Bosch W, et al. Physiotherapy management of low back pain: does practice match the Dutch guidelines? *Aust J Physiother.* 2005; 51(1):35-41.
23. Slot KB, Berge E. Thrombolytic treatment for stroke: patient preferences for treatment, information and involvement. *J Stroke Cerebrovasc Dis*. 2009;18(1):17-22.
24. Elwyn G, Buetow S, Hibbard J, et al. Measuring quality through performance. Respecting the subjective: quality measurement from the patient's perspective. *BMJ.* 2007;335(7628):1021-2.
25. Chenot JF, Sherer M, Becker A, et al. Acceptance and perceived barriers of implementing a guideline for managing low back in general practice. *Implement Sci.* 2008; 3:7. doi:10.1186/1748-5908-3-7.
26. Elwyn G. Patient consent-decision or assumption? [Editorial]. *BMJ*. 2008;336(7656):1259-60.
27. Grol R. Improving the quality of medical care: Building bridges among professional pride, payer profit, and patient satisfaction. *JAMA*. 2001;286(20):2578-85.
28. Atherton H, Car J, Meyer B. Email for the provision of information on disease prevention and health promotion. Cochrane Database of Systematic reviews 2009, Issue 3. Art. No.: CD007982. DOI:10.1002/14651858. CD007982. http://www.cochrane.org Accessed on June 2007.
29. Grilli R, Freemantle N, Minozzi S, et al. Impact of mass media on the use of health services. A systematic review of the literature. *Epidemiol Prev*. 1998;22(2):103-110. Review. Italian. PMID: 9789382.

30. Farmer AP, Légaré F, Turcot L, et al. Printed educational materials: effects on professional practice and health care outcomes. Cochrane Database of Systematic Reviews 2008, Issue 3. Art. No.: CD004398. DOI: 10.1002/14651858. CD004398.pub2. http://www.cochrane.org Accessed on June 2007.
31. Grimshaw J, Freemantle N, Wallace S, et al. Developing and implementing clinical practice guidelines. *Qual Saf Health Care.* 1995;4(1):55-64.
32. Bekkering GE, Hendriks HJM, van Tulder MW, et al. Effect on the process of care of an active strategy to implement clinical guidelines on physiotherapy for low back pain: a cluster randomized controlled trial. *Qual Saf Health Care 2005*;14(2):107-12.
33. National Institute for Health and Clinical Excellence (NHS). Low Back Pain Early Management of Persistent non- specific low back pain. May 2009. NICE Clinical Guidelines 88. Developed by the National Collaborating Centre for Primary Care. http://guidance.nice.org.uk/CG88 Accessed on July 2009.
34. Bekkering GE, Engers AJ, Wensing M, et al. Development of an implementation strategy for physiotherapy guidelines on low back pain. *Aust J Physiother*. 2003;49(3):208-14.
35. Bekkering GE, van Tulder MW, Hendriks EJM, et al. Implementation of clinical guidelines on physical therapy for patients with low back pain: Randomized trial comparing patient outcomes after a standard and active implementation. *Phys Ther*. 2005;85(6):544-55.
36. Swinkels ICS, Wimmers RH, Groenewegen PP, et al. What factors explain the number of physical therapy treatment sessions in patients referred with low back pain; a multilevel analysis. *BMC Health Serv Res*. 2005;5:74. doi: 10.1186/1472-6963-5-74.
37. Leemrijse C J, Plas G M, Hofhuis H, et al. Compliance with the guidelines for acute ankle sprain for physiotherapists is moderate in the Netherlands: an observational study. *Aust J Physiother*. 2006;52(4):293-9.
38. Jette DU, Bacon K, Batty C, et al. Evidence-based practice: Beliefs, attitudes, knowledge, and behaviors of physical therapists. *Phys Ther.* 2003;83(9);786-805.