Enhancing Self efficacy of Patients with Neck Functional Disability

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Abstract:

Background: Self-efficacy is of particular importance in conditions that need rehabilitation such as neck pain. **Aim:** the aim of this study was to investigate the effect of enhancing the self-efficacy of patients with neck pain on their functional disability. **Setting & sample:** the study was conducted at the inpatient and outpatient sections in Al-kasr Al-Aini Hospital, affiliated to Cairo University using a quasi-experimental design with pre-post assessment on 40 adults having non-traumatic neck pain. **Tools:** the data were collected using a self-administered questionnaire that included Copenhagen Neck Functional Disability Scale and the Arthritis Self-Efficacy Scale. The nursing intervention consisted of individualized educational sessions about proper body mechanics, isometric exercise, hot and cold application. The effect of the intervention was evaluated by the same questionnaire. The fieldwork started in May and ended in November 2010. **The results** demonstrated significant improvements in the scores of Copenhagen scale after the intervention; the median total score decreased from 21 to 12 ($p<0.001$). Self-efficacy scores also improved; the median total score increased from 31.0 to 57.7 ($p<0.001$). Regression analysis identified self-efficacy score as an independent statistically significant negative predictor of Copenhagen score, indicating less disability. **Conclusion:** study findings lead to the conclusion that a nursing educational program focused on improving the self-efficacy of the patients with neck pain led to improvement in their functional disability. **Recommendations:** The study recommends further confirmation of the study findings through a randomized clinical trial. Moreover, validation of the tool in the local context is proposed.

Key words: Self efficacy; Patients; Neck Functional Disability

Introduction:

Neck pain is common disabling and costly complaint in the adult population **(Bot et al., 2005)**, with a lifetime prevalence ranging from 26% to 71% **(Peloso et al., 2007)**. It has negative impacts on general, economic, occupational, and societal health **(Côté et al., 2008; Saskatchewan Workers' Compensation Board, 2008)**. It accounts for approximately 30% of chiropractic and 15% of physiotherapy visits **(Peloso et al., 2007)**.

Neck pain has a multifactor etiology with both modifiable and non-modifiable risk factors. The modifiable risk factors include smoking, both active and passive, physical inactivity, high job demands, sedentary work position, and repetitive work **(Kirsten et al., 2010)**. The non-modifiable risk factors include older age, female gender, and genetics **(Cassou, Derriennic & Monfort, 2002; Gerr, Marcus & Ensor, 2002; McLean et al., 2010)**. Many non-surgical approaches are used in the treatment of neck pain, including educational programs, manual therapy, exercises, and other physiotherapy modalities. None of these treatments was shown to be better than the other **(Haldeman et**

al., 2008). Thus, rehabilitation is a mainstay in the management of this disorder.

Perceived self-efficacy is a perception of own ability to carry out a certain behavior. Based on social cognitive theory, it reflects individual's personal confidence in one's capacity to undertake behaviors that may lead to desired outcomes **(Marks, Allegrante & Lorig, 2005)**. Hence is an essential drive to acquire needed skills and their underlying and has been positively related to better health outcomes **(Motl et al., 2009)**.

Self-efficacy is of particular importance in rehabilitation **(Motl & Snook, 2008)**. It is pivotal in understanding cognitive, physical, and psychological functioning. Individuals with high self-efficacy experience less feelings of anxiety and depression, have better coping with illness and its associated problems, and better practice of self-care activities. It may have an impact on how much effort patients invest in their rehabilitation, their compliance, and their maintenance of a positive attitude towards rehabilitation goals **(Motl et al., 2009)**. Hence, improving self-efficacy may be a means to enhance the outcomes of patients attending rehabilitation **(Barlow, 2012)**.

Nurses have an important role in successful patient education, especially in settings dealing with chronic diseases needing long-term therapies. They can empower patients to make informed choices of coping strategies **(Arvidsson et al., 2006)**. They should be able to assess patients' self-efficacy and enhance it in order to improve their outcomes. This is of particular importance for patients with weak self-efficacy who may need special attention and emotional support. This may improve these patients' health and satisfaction and decrease the burden on the health care system **(Cross et al., 2006)**.

Significance of the study:

Many studies evaluated the effectiveness of complete management of back pain including exercise, hot and cold compresses, relaxation techniques, and body mechanics. However, few studies addressed the effect of these measures on relieving neck pain functional disability through enhancing patients' self-efficacy. Moreover, systematic reviews of the effectiveness of the efficacy of educational intervention with noninvasive physical management in reducing neck pain had conflicting results. Thus, in a Cochrane systematic review of trials **Bronfort et al. (2004)** found a high heterogeneity between the studies. Meanwhile, a more recent Cochrane systematic review concluded that there is no evidence of the effectiveness of educational interventions for neck pain, and recommended future research.

Aim of the study:

The aim of this study was to investigate the effect of enhancing the self-efficacy of patients with neck pain on their functional disability.

Research hypothesis:

The self-efficacy of patients with neck functional disability improves after participation in a patient's education and exercise program, with associated significant improvement in their functional disability scores.

Subjects and methods:

Research design:

A quasi-experimental design with pre-post assessment was adopted to achieve the aim of the study.

Setting:

The study was conducted at the inpatient and outpatient sections in Al-kasr Al-Aini Hospital, affiliated to Cairo University.

Subjects:

The study involved a group of forty adults male and female patients, age ranged from 30-56, and diagnosed as having non-traumatic neck pain or cervical spondylosis. Patients having fractured vertebrae, spinal stenosis, or having had neck surgery were excluded. This sample size was estimated to be able to detect a minimally clinically important difference in the Copenhagen score of 19% according to **Cleland et al (2007)**. All patients were on the same protocol of medical treatment and physiotherapy technique.

Data collection tool:

A self-administered questionnaire form was utilized to collect data. It consists of four parts:

- ***The first part*** is concerned with personal data as age, education, occupation, income, etc.

- ***The second part*** is for recording related medical history such as the duration of illness, associated symptoms as muscles spasm and stiffness, as well as risk or aggravating factors as prolonged time in a certain position, bad sleep habits, obesity, etc.

- ***The third part*** of the tool consists of the Copenhagen Neck Functional Disability Scale developed by **Jordan et al., (1998)** to evaluate the disability experienced by patients with neck pain. It is a 15-item questionnaire that measures neck dysfunction related to sleep, managing daily activities, putting on clothes, brushing teeth, spending more time than usual at home, lifting objects weighing from 2-4 kilograms, reading activity, headaches, ability to concentrate, participating in usual leisure time activities, remain in bed longer than usual, influenced emotional relationship with nearest family, social contact, influence future. The scale has 3-point Likert scale yes, occasionally, and no scored 2, 1, and 0 respectively. The scoring is reversed for the first five items so that a higher score in all items indicates greater disability. A total score is calculated by simple summation of the scores of the 15 items. The tool reliability was shown to be high (Cronbach's alpha coefficient for internal consistency 0.9 for the entire scale), and high construct validity with strong correlation with pain scores as well as to doctor and patient global assessments **(Jordan et al, 1998)**.

  The scale was translated into Arabic using the translation-back-translation method to ensure its validity **(Maxwell, 1996)**. Its reliability was measured in the pilot and proved to be high with Cronbach alpha coefficient for internal consistency 0.801 for the entire scale.

- ***The fourth part*** of the tool consists of the Arthritis Self-Efficacy Scale (ASES) developed by **Lorig et al., (1989)** to measures confidence in one's ability to perform specific self-management behaviors for individuals with all forms of arthritis, e.g., decreasing pain, keeping pain from interfering with normal activities, and dealing with the frustration of having arthritis. The short –item version of the questionnaire was used in this

study. Each question is scored on a 9 cm numeric rating scale ranging from 1 = very uncertain, 5-6 = moderately uncertain, and 10 = very certain. Higher scores indicate higher self-efficacy. The scale has good construct validity and is correlated with task performance (r = 0.61) and health status (r = 0.35 to 0.73). Its internal consistency is high, Cronbach alpha coefficient ranging from 0.75 to 0.90 **(Gonzalez et al, 1995; Lorig & Holman, 1998)**.

The scale was also translated into Arabic using the translation-back-translation method to ensure its validity. Its reliability was measured in the pilot and proved to be high with Cronbach alpha coefficient for internal consistency 0.932 for the entire scale.

Pilot study:

An initial pilot study was done on 10% of patients with neck pain to test the study tool in terms of clarity, and the time required to be applied, as well as the applicability of the scales. Patients involved in the pilot study were not included in the main study sample.

Field work:

The researchers met with the neck pain patients who met the criteria for inclusion, explained to them the aim and procedures and invited them to participate. Those who agreed signed a written consent explaining the aim, procedures, and participant's rights. The researchers then started the actual study maneuver, which involved the following, three phases:

- **Assessment phase**: Baseline data were obtained from patients using the designed tool. The time to fill out the form was approximately 25 minutes. Illiterate patients were helped by one of their family members to fill out the questionnaire.

- **Intervention phase**: All patients were kept on their routine care and regular medication. The patients were subjected in addition to the study intervention program. This was in the form of individualized sessions, which included education about proper body mechanics and performing isometric exercise. Each patient had two sessions: one session of exercise and hot / cold applications, and the other session of body mechanics and relaxation technique. Each session was 15 minutes long. This was done three times per week. The researchers educated the patients to do active exercises, introduced different types of exercise gradually, and educated them to perform it at home three times daily. If the patient was unable to perform active exercises, he/she was encouraged to ask the help of another person at home who has been trained by the researchers. The researchers prepared an illustrated educational booklet and delivered it to patients to help them in complying with the program. They were also asked to keep a diary to record their compliance during the intervention.

- **Evaluation phase:** At the end of the intervention program, each patient was asked to fill out the same self-administered data collection form. The fieldwork started in May and ended in November 2010.

Administrative and ethical considerations:

An official approval was obtained from Director of Al-kasr Al-Aini Hospital, and the heads of the departments through a letter

addressed from the Faculty of Nursing Cairo University explaining the aim of the study, its procedures, and the expected duration.

Patients were informed of the purpose, tool, procedures, and duration of the study and signed a written consent. They were given full explanations about the benefits of the study maneuver, as well as their rights to refuse or withdraw at any time without giving reasons and without consequences on their care. The researchers assured them about the confidentiality of the data. The study maneuvers could not have any potential harmful effect on participants.

Statistical analysis:

Data entry and statistical analysis were done using SPSS 16.0 statistical software package. Quantitative continuous data were compared using the non-parametric Mann-Whitney test as normal distribution of the data could not be assumed. In order to identify the independent predictors of Copenhagen score, multiple linear regression analysis was used, with analysis of variance for the full regression model. Statistical significance was considered at p-value <0.05.

Results:

The study included 40 patients with mean age 44 years and equal number men and women **(Table 1)**. The majority was married and had insufficient income. Approximately two thirds had no formal education (65%) and 60% are rural residence. As the table shows, slightly less than half of the participants (47.5%) had manual work.

Table (2): demonstrates that approximately two-thirds of the participants were having their neck pain for more than two years. The majority of them reported risk or aggravating factors as staying for prolonged times in the same position (90%), and bad sleeping habits (80%). Organic factors as osteoarthritis and cervical disc were each present in 37.5% of them.

Table (3) shows statistically significant improvements in the scores of Copenhagen scale (lower means and medians) among patients after the intervention ($p < 0.001$). This was revealed in all items, with the only exception of the item regarding "feel neck pain will affect your future," which showed significant increase in the mean, although the median did not change. The median total score decreased from 21 to 12 ($p<0.001$).

Concerning self-efficacy, **table (4)** demonstrates statistically significant improvements of the scores after the intervention ($p <0.001$). This was shown in all the eight items as well as the total score. The median total score increased from 31.0 to 57.7 ($p<0.001$).

Table (5) presents the best fitting linear regression model for Copenhagen score. It indicates that age was a statistically significant independent positive predictor. Conversely the self-efficacy score was an independent statistically significant negative predictor, indicating lower score or less disability. The regression model explains 29% of the variation in Copenhagen score as indicated by the r-square value.

Discussion:

The study findings showed a significant improvement in the functional disability (Copenhagen scores) of the patients with neck pain, and this improvement is predicted by their self-efficacy score. The findings

lead to acceptance of the research hypothesis that assumed such improvement after attendance of the educational program emphasizing patients' self-efficacy.

The present study revealed an improvement in Copenhagen score of approximately less than half of the study sample when comparing the pre-post scores. This is more than double the hypothesized minimally clinically important difference (19%), which confirms the efficacy of the intervention. The finding is in agreement with the results of a controlled, non-randomized trial that evaluated the effectiveness of a simple educational and physical program to decrease muscle tension in the head and neck/shoulder area. The study demonstrated that headache and neck/shoulder pain was reduced by about 40% in the intervention group and the positive effects were maintained at a 12-month follow-up **(Mongini et al., 2009)**. Similar findings were also reported in a cluster-randomized controlled trial in a large working community, with a reduction of pain 1.5 times in the intervention group compared to controls **(Mongini et al., 2012)**.

The current study has also demonstrated significant improvements in the self-efficacy scores of the patients after having attended the educational intervention. This improvement was shown to have an independent influence on the Copenhagen score in multiple regression analysis. Thus, a higher self-efficacy score predicted a lower Copenhagen score, indicating less functional disability. The finding goes in line with previous studies that showed better health status outcomes in many conditions in the context of rehabilitation with improved self-efficacy **(Motl & Snook, 2008; Motl et al., 2009; Gustavsson, Denison& Vonkoch, 2010)**. Moreover, **Söderlund, Oleurd** and **Lindberg (2000)** demonstrated that self-efficacy less pain-related avoidant behavior and medication demands in patients with neck pain.

On the contrary, a randomized clinical trial comparing dynamic muscle training, relaxation training, and advice to continue with ordinary activities found no significant difference in outcomes between exercise and control groups **(Viljanen, Malmivaara & Uitti, 2003)**. However, this has been explained by the low compliance of the patients which was only 40% of the target. In fact, non-adherence of patients to unsupervised long-term exercise is a major problem that may affect treatment outcome. In the current study, the participants demonstrated high compliance as revealed by their diaries.

The multiple regression analysis identified patient's age, in addition to the self-efficacy score, as an independent positive predictor of the Copenhagen score, indicating more functional disability with increasing age. The finding is in congruence with previous research that confirmed such relationship **(Bot et al., 2004; Fejer, Kyvik & Hartvigsen, 2006)**. In this respect, **McLean et al. (2010)** mentioned that the incidence of neck pain with age is thought to steadily increase until about the age of 55, at which it reaches a steady state. In fact, the maximum age in the present study sample was 57, which explains the linear relationship with Copenhagen score. Meanwhile, and in disagreement with previous studies, other potential risk factors as sex, work, and duration of illness were not significant independent predictors of the Copenhagen score in the current study.

This might be due to the small sample size, which was based only on the change in Copenhagen score, the main study outcome.

Conclusion and recommendations:

the study findings lead to the conclusion that a nursing educational intervention focused on enhancing the self-efficacy of the patients with neck pain led to improvement in their functional disability. However, the study limitations of the study must be considered. These included the quasi-experimental study design with lack of randomization. Additionally, although the tools used are standardized and have high levels of reliability and validity, they are have been validated in the western context and may have cultural bias **(Leonard et al., 2009)**.

The study recommended further confirmation of the study findings through a randomized clinical trial. Moreover, validation of the tool in the local context is proposed.

Table (1): Socio-demographic characteristics and duration of illness of patients in the study sample (n=40)

Item	Frequency	Percent
Gender:		
Male	20	50.0
Female	20	50.0
Age (years):		
<50	28	70.0
50+	12	30.0
Range	30-56	
Mean±SD	44.1±7.8	
Education:		
No formal education	26	65.0
Educated	14	35.0
Marital status:		
Unmarried	5	12.5
Married	35	87.5
Job:		
Employee	11	27.5
Manual worker	19	47.5
Unemployed	10	25.0
Income		
Sufficient	6	15.0
Insufficient	34	85.0
Residence:		
Rural	24	60.0
Urban	16	40.0

Table 2: Risk factors of neck pain among patients in the study sample (n=40)

Item	Frequency	Percent
Duration of illness (years):		
1-2	14	35.0
>2	26	65.0
Risk/aggravating factors for neck pain:		
Prolonged time in same position	36	90.0
Bad sleeping habit (too high/low pillows)	32	80.0
Brisk movements	25	62.5
Mental stress	20	50.0
Osteoarthritis	15	37.5
Cervical disc	15	37.5
Obesity	9	22.5
Accident	8	20.0
Total number of risk factors:		
Range	2-8	
Mean±SD	4.8±1.3	
Median	5	

Table 3: Scores of Copenhagen scale for neck pain among patients in the study sample before and after the intervention

Copenhagen scale scores (max=2)	Time				Mann Whitney Test (Z)	p-value
	Pre (n=40)		Post (n=40)			
	mean±SD	Median	mean±SD	Median		
Night sleep without neck pain (reversed score)	2.0±0.2	2.0	0.6±0.5	1.0	8.10	<0.001*
Daily life activities without neck pain (reversed score)	1.7±0.5	2.0	0.5±0.6	0.5	6.88	<0.001*
Daily life activities with no help (reversed score)	1.2±0.7	1.0	0.3±0.5	0.0	5.16	<0.001*
Easy clothing (reversed score)	1.2±0.7	1.0	0.4±0.5	0.0	4.70	<0.001*
Bending for tooth brushing without neck pain (reversed score)	1.6±0.5	1.0	0.7±0.5	0.0	5.86	<0.001*
Stay longer at home due to neck pain	1.7±0.7	2.0	1.1±0.5	1.0	4.57	<0.001*
Inability to carry objects 2-4 kg due to neck pain	1.5±0.5	1.5	0.6±0.5	1.0	5.26	<0.001*
Inability to read due to neck pain	1.6±0.6	2.0	0.5±0.5	1.0	6.28	<0.001*
Headache due to neck pain	1.6±0.5	2.0	0.3±0.5	0.0	7.05	<0.001*
Inability to concentrate due to neck pain	1.6±0.5	2.0	0.6±0.5	1.0	6.44	<0.001*
Inability to participate in pastime activities due to neck pain	1.7±0.6	2.0	0.7±0.5	1.0	5.99	<0.001*
Stay longer in bed due to neck pain	1.4±0.6	1.0	0.5±0.6	0.0	5.32	<0.001*
Relation to near person affected due to neck pain	1.2±0.7	1.0	0.5±0.5	1.0	4.30	<0.001*
Inability to participate in social activities for about 2 weeks due to neck pain	1.2±0.6	1.0	0.6±0.5	1.0	3.96	<0.001*
Feel neck pain will affect your future	1.1±0.4	1.0	1.4±0.5	1.0	2.88	<0.001*
Total score (max=30)	**20.6±3.6**	**21.0**	**11.1±2.5**	**12.0**	**7.19**	**<0.001***

(*) Statistically significant at p<0.05

Table 4: Scores of self-efficacy among patients in the study sample before and after the intervention

Self-efficacy scores (max=10)	Time				Mann Whitney Test (Z)	p-value
	Pre (n=40)		Post (n=40)			
	mean±SD	Median	mean±SD	Median		
How certain are you that you can decrease your pain quite a bit?	3.1±1.1	2.5	6.2±1.3	5.0	7.25	<0.001*
How certain are you that you can keep your arthritis or fibromyalgia pain from interfering with your sleep?	3.1±1.1	2.5	6.6±1.3	7.5	7.54	<0.001*
How certain are you that you can keep your arthritis or fibromyalgia pain from interfering with the things you want to do?	3.8±1.3	3.8	6.3±1.3	6.3	6.28	<0.001*
How certain are you that you can regulate your activity so as to be active without aggravating your arthritis or fibromyalgia?	3.1±1.1	2.5	5.9±1.2	5.0	7.14	<0.001*
How certain are you that you can keep the fatigue caused by your arthritis or fibromyalgia from interfering with the things you want to do?	3.5±1.2	2.5	6.8±1.4	7.5	6.97	<0.001*
How certain are you that you can do something to help yourself feel better if you are feeling blue?	3.3±1.2	2.5	6.6±1.2	7.5	7.31	<0.001*
As compared with other people with arthritis or fibromyalgia like yours, how certain are you that you can manage pain during your daily activities?	3.4±1.2	2.5	6.5±1.2	7.5	6.96	<0.001*
How certain are you that you can deal with the frustration of arthritis or fibromyalgia?	3.4±1.2	2.5	6.5±1.2	7.5	6.96	<0.001*
Headache due to neck pain	3.4±0.4	3.5	6.5±0.5	6.4	7.75	<0.001*
Total score (max=80)	**30.0±3.6**	**31.0**	**57.9±4.8**	**57.7**	**7.75**	**<0.001***

(*) Statistically significant at p<0.05

Table 5: Best fitting multiple linear regression model for Copenhagen score

	Unstandardized Coefficients		Standardized Coefficients	t-test	p-value	95% Confidence Interval for B	
	B	Std. Error				Lower	Upper
Constant	16.11	1.77		9.12	<0.001	12.59	19.62
Age	.10	.04	.27	2.84	0.006	.03	.17
Self-efficacy score	-.09	.02	-.47	4.85	<0.001	-.13	-.05

r-square = 0.29
Model ANOVA: F=15.82, p<0.001
Variables entered and excluded: sex, education, marital status, job status, duration of illness, number of risk factors

References:

- **Arvidsson S.B., Petersson A., Nilsson I., Andersson B., Arvidsson B., Petersson I.F., & Fridlund B. (2006)**: A nurse-led rheumatology clinic's impact on empowering patients with rheumatoid arthritis: a qualitative study. Nursing and Health Sciences; 8: 133-139.
- **Barlow J. (2012)**: Self-efficacy in the context of rehabilitation. In: JH Stone, M Blouin, editors. International Encyclopedia of Rehabilitation. Available online: http://cirrie.buffalo.edu/ encyclopedia/en/article/35/. Accessed on Nov. 22, 2012.
- **Bot S.D., Terwee C.B., Windt D.A. van der, Bouter L.M., Dekker J., de & Vet H.C. (2004)**: Clinimetric evaluation of shoulder disability questionnaires: a systematic review of the literature. Ann Rheum Dis; 63(4):335-341.
- **Bot S.D., Waal J.M., van der, Terwee C.B., Windt D.A., van der, Schellevis F.G., Bouter L.M., & Dekker J. (2005)**: Incidence and prevalence of complaints of the neck and upper extremity in general practice. Ann Rheum Dis; 64(1):118-123.
- **Bronfort G., Nilsson N., Haas M., Evans R. & Goldsmith C.H. (2004)**: Noninvasive physical treatments for chronic/recurrent headache. Cochrane Database Syst Rev: CD001878.
- **Cassou B., Derriennic F. & Monfort C. (2002)**: Chronic neck and shoulder pain, age, and working conditions: longitudinal results from a large random sample in France. Occup Environ Med; 59:537-44.
- **Cleland J.A., Childs J.D., Fritz J.M., Whitman J.M. & Eberhart S.L. (2007)**: Development of a clinical prediction rule for guiding treatment of a subgroup of patients with neck pain: use of thoracic spine manipulation, exercise, and patient education. Physical Therapy; 87: 9-23.
- **Côté P., Kristman V., Vidmar M., Van Eerd D., Hogg-Johnson S., Beaton D. & Smith P.M. (2008)**: The prevalence and incidence of work absenteeism involving neck pain: A cohort of Ontario lost-time claimants. Spine; 33:S192-S198.
- **Cross M.J., March L.M., Lapsley H.M., Byrne E. & Brooks P.M. (2006)**: Patient self-efficacy and health locus of control: relationship with health status and arthritis-related expenditure. Rheumatology; 45: 92-96.
- **Fejer R., Kyvik K.O. & Hartvigsen J. (2006)**: The prevalence of neck pain in the world population: a systematic

critical review of the literature. Eur Spine J; 15(6):834-848.

- **Gerr F., Marcus M. & Ensor C. (2002)**: A prospective study of computer users: I. Study design and incidence of musculoskeletal symptoms and disorders. Am J Ind Med; 41:221-35.

- **Gonzalez V.M., StewartA., Ritter P.L. & Lorig K. (1995)**: Translation and validation of arthritis outcome measures into Spanish. Arthritis and Rheumatism, 38, 1429-1446.

- **Gustavsson C., Denison E. & von Koch L. (2010)**: Self-management of persistent neck pain: A randomized controlled trial of a multi-component group intervention in primary health care. European Journal of Pain; 4 (Issue 6): 630.

- **Haldeman S., Carroll L., Cassidy J.D., Schubert D.C.J. & Nygren, Å. (2008)**:The Bone and Joint Decade 2000–2010 Task Force on Neck Pain and Its Associated Disorders .SPINE; 33(4S): S5–S7.

- **Hewlett S., Cockshott Z., Kirwan J., Barrett J., Stamp J. & Haslock I. (2001)**: Development and validation of a self-efficacy scale for use in British patients with rheumatoid arthritis (RASE), Rheumatology, vol. 40, no. 11, pp. 1221–1230

- **Jordan A., Manniche C., Mosdal C. & Hindsberger C. (1998)**: The Copenhagen neck functional disability scale: a study of reliability and validity. J Manipulative Physiol Ther.; 21(8):520–527

- **Kirsten J., Sionnadh Mairi M., Jennifer Klaber M. & Eric G. (2010)**: Barriers to treatment adherence in physiotherapy outpatient clinics: A systematic review. Manual Ther; 15: 220-8.

- **Leonard J.H., Choo C.P., Abdul Manaf M.R., Zaleha Nordin N.A.M. & Srijit D.A.S. (2009)**: Development and evaluation of 'neck pain and functional limitation scale': a validation study in the asian context. Indian J Med Sci; 63(10).

- **Lorig K. & Holman H. (1998)**: Arthritis self-efficacy scales measure self-efficacy. Arthritis Care and Research; 11: 155-157.

- **Lorig K., Chastain R.L., Ung E., Shoor S. & Holman H.R. (1989)**: Development and evaluation of a scale to measure self-efficacy in people with arthritis. Arthritis and Rheumatism; 32(1): 37-44

- **Marks R., Allegrante J. P. & Lorig K. (2005)**: "A review and synthesis of research evidence for self-efficacy-enhancing interventions for reducing chronic disability: implications for health education practice (part I)," Health Promotion Practice; 6(1):37–43.

- **Maxwell B. (1996)**: "Translation and Cultural Adaptation of the Survey Instruments" in M.O. Martin and D.L. Kelly (eds.), Third International Mathematics and Science Study (TIMSS) Technical Report, Volume I: Design and Development. Chestnut Hill, MA: Boston College.

- **McLean S.M., May S., Klaber-Moffett J., Sharp D.M. & Gardiner E. (2010)**: Risk factors for the onset of non-specific neck pain: a systematic review. J Epidemiol Community Health; 64:565-572. doi :10.1136/jech. 2009.090720.

- **Mongini F., Ciccone G., Rota E., Ferrero L. & Ugolini A. (2008)**: Effectiveness of an educational and physical programme in reducing headache, neck and shoulder pain: a workplace controlled trial. Cephalalgia; 28: 541–552.

- **Mongini F., Evangelista A., Milani C., Ferrero L. & Ciccone G. (2012)**: An Educational and Physical Program

to Reduce Headache, Neck/Shoulder Pain in a Working Community: A Cluster-Randomized Controlled Trial. PLoS ONE 7(1): e29637. doi:10.1371/journal.pone.0029637

- **Mongini F., Evangelista A., Rota E., Ferrero L. & Ugolini A. (2009)**: Long-term benefits of an educational and physical program on headache, and neck and shoulder pain, in a working community. J Pain; 10: 1138–1145.

- **Motl R.W. & Snook E.M. (2008)**: Physical activity, self-efficacy and quality of life in multiple sclerosis. Annals of Behavioral Medicine 35(1): 111-5.

- **Motl R.W., McAuley E., Snook E.M. & Gliottoni R.C. (2009)**: Physical activity and quality of life in multiple sclerosis: Intermediary roles of disability, fatigue, mood, pain, self-efficacy and social support. Psychology, Health and Medicine; 14(1):111-24.

- **Peloso P.M.J., Gross A., Haines T., Trinh K., Goldsmith C.H. & Burnie S.J. (2007)**: Cervical Overview Group. Medicinal and injection therapies for mechanical neck disorders. Cochrane Database Syst Rev; 3:CD000319.

- **Saskatchewan Workers' Compensation Board. (2008)**: Statistical Supplement www.wcbsask.com/WCBPortal/Show-Property/WCB Repository/formsPublications /ublications/annualPubs/2005Statistica l Sum mary/pdfContent. Accessed on: October 15, 2008.

- **Söderlund A., Olerud C. & Lindberg P. (2000)**: Acute whiplash-associated disorders (WAD): the effects of early mobilization and prognostic factors in long-term symptomatology. Clinical Rehabilitation; 14: 457–467.

- **Viljanen M., Malmivaara A. & Uitti J. (2003)**: Effectiveness of dynamic muscle training, relaxation training, or ordinary activity for chronic neck pain: randomised controlled trial. BMJ; 327:475– 477.