



## Psychological Intervention and Pain Severity among a Sample of Iranian Nurses Suffering from Chronic Low Back Pain: a Randomized Clinical Trial

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**Background:** Chronic Low back pain (CLBP) is one of the most prevalent health problems which is affected by psychological disorders. The aim of this study was to evaluate the role of psychological intervention on chronic low back pain among a sample of Iranian nurses.

**Material and Methods:** This is a randomized clinical trial. The participants of this study consisted of 84 nurses suffering from chronic back pain and working in Valiasr hospital, Tehran-Iran. The recruited nurses were randomly assigned to intervention and control groups (42 nurses in each group). The demographic questionnaire and Visual Analog Assessment scales (VAS) and a Depression Anxiety Stress Scale (DASS) were used to collect data at the beginning of the study and 3 months following completion of the intervention. Data were analyzed using Chi-square, T-test and paired T-test.

**Results:** Forty-two nurses, with a mean age of  $32 \pm 8.2$  and  $31.5 \pm 7.4$  years in the intervention group and control group respectively, took part in this study. The two groups were not significantly different at the beginning of the study in terms of demographic data ( $P > 0.05$ ). At the 3-month follow up, the pain rate in the intervention group was significantly decreased from 4.47 to 4.09 ( $P < 0.0001$ ). Furthermore in intervention group, the mean scores of anxiety intervention group were decreased from 17.73 to 9.76 ( $P < 0.0001$ ). Decreased Stress scores decreased from 15.52 to 9.52 ( $P < 0.0001$ ), and the depression score from 17.66 to 10.45 ( $P < 0.0001$ ).

**Conclusions:** The findings of this study showed that psychological interventions reduced stress anxiety, depression as well as low back pain among Iranian nurses. It is recommended that further research with larger sample and longer follow up be conducted to confirm the findings of this study.

**Keywords:** Chronic low back pain, Nurses, Mental health, Psychological intervention. Randomized control trial

### Introduction

Chronic Low Back Pain (CLBP) is one of the most common multidimensional musculoskeletal disorders among nurses worldwide (Sikiru, 2010).

There is considerable evidence indicating an increased evidence of psychological problems among clients who suffer from CLBP (Asghari, Julaeiha & Godarzi 2008). Extensive disability

related to low back pain (LBP) combined with limited response to treatment, led to the further exploration of the effects of psychological factors on CLBP (Gureje et al., 2008).

Previous research showed that psychological distress is an important and significant contributor to CLBP (Mitchell et al., 2009). Furthermore, it has been argued that anxiety disorder is more prevalent among LBP sufferers compared with the general population (Demyttenaere et al., 2007). Epidemiological studies revealed that chronic back pain has often been linked with chronic conditions such as mental disorders, particularly depression (von Korff et al., 2005). Environmental, physical and psychological/emotional stress are a key factor leading to the creation of continued CLBP (Lorusso Bruno & Labbate, 2007). Evidence shows that chronic low back pain and depression as the two

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most frequent reasons for which medical care is sought (Nicholas, 2007).

Reports of the incidence of chronic back pain linked to mental disorders have been varied (Von Korff et al., 2005). Moreover, there is insufficient evidence to show an association between CLBP and anxiety disorders in the general populations of developing countries (Roditi & Robinson, 2011). In previous studies, significant improvement in mental health was observed over time by CLBP patients who underwent the designed multidisciplinary program time (Deyo et al., 2009). However the intervention described in these studies was based on bio-psycho-social dimensions of CLBP and conducted solely among women living with CLBP. Studies showed that the risk of low back pain increased rapidly due to heavy physical work and psychological stress (Maul et al., 2003; Punnett & Wegman, 2004). Moreover, previous evidence showed that lower back pain is the most commonly stated reason for nurses to change their jobs (Bass et al., 2004). Nurses, because of the nature of their profession, face risks such as worksite stress and unhealthy physical and social behaviors that lead to musculoskeletal disorders. The pain frequently experienced by nurses undermines their psychological health and reduces professional performance. Therefore, enhancing healthy behaviors among nurses through a combination of biological, psychological and social factors is essential (McElligott et al., 2009). Creation of a supportive environment could also lead to many positive changes that enhance the wellbeing of nurses (McElligott et al., 2009; Cleary & Walter, 2005). As there is little evidence of psychological interventions among Iranian LBP patients which have focused on pain reduction, the aim of this study is to assess the role of a psychological intervention on CLBP among Iranian nurses.

## Material and Methods

The aim of this randomized clinical trial is to determine the effect of a psychological intervention on CLBP among nurses. The sample for this study consisted of 84 nurses suffering from CLBP who are working in Valiasr Hospital, Iran. Which affiliated to Tehran University of Medical Sciences Tehran, Patients from different geographical regions are referred to this general hospital which located in the center of Tehran. All participants in this study suffered from chronic mechanical low back pain for more than three months, were between 24 and 50 years in age, and had worked in the hospital over one year.

Exclusion criteria included pregnancy, previous spinal surgery, inflammation of back vertebra and spinal abnormalities. Data were collected through demographic questionnaire scales, Pain Intensity Scale and a Psychological Inventory (Dass-21).

**Pain Intensity Scale: (VAS)** This instrument perceived pain intensity. The Visual Analog Scale (VAS). This scale consists of eleven numbers, numbered from zero to ten. Zero indicates no pain and ten indicates severe pain. Reliability and validity of this scale was demonstrated in previous research (Ogon et al., 1996).

**Dass-21 psychological scale:** Depression, Anxiety, Stress Scale (DASS) is a set of three self-report scales that measure depression, anxiety and stress. Each subscale contains 7 questions. The final score for each subscale is obtained by the sum of the questions. Each question is measured by four options with scores ranging from zero (does not apply to me at all) to 3 (completely apply to me). Each subscale is graded in the range of 0 to 21, with the higher score indicating the worse condition. Each factor (depression, anxiety and stress) is measured by 7 items. Anthony (1998) reported an acceptable reliability and validity for the measure (Antony et al., 1998). Validity and reliability of the Iranian version of the scale were reported in acceptable range (Samani & Jokar, 2007).

The three subscales of DASS as well as VAS were completed by all participants upon initiation of the study. Then the participants were divided into two groups of intervention (n = 42) or control (n = 42). To do this randomly selected the first three recruited participants were assigned to the intervention group and the next three participants were assigned to the control group, and so on. The participants in the intervention group received educational classes focused on psychological interventions and they received an educational package. The control group did not receive either educational intervention.

Psychological intervention was provided during four one-hour classes by a psychologist. The classes included instructions regarding methods of coping with stress, anxiety and depression (stress management), ways to be happy (happiness), the manner of improving interpersonal relationships and finally, relaxation techniques. The classes were developed and implemented by a psychologist and the first researcher. They used lectures, group discussion and responses to individual questions to manage the class. Classes were held in groups of ten. Each participant took part in four one-hour

focus group sessions managed by a health educator. Pain as primary outcome and stress, anxiety and depression as secondary outcomes were examined from both groups three months post-intervention using VAS and DASS 21 tools.

This study was conducted with the full consent of the participants. The participants were provided with the details of the study procedure. The consent form was signed by all participants. The ethics committee of the Tarbiat Modares University approved the study.

## Results

A total of 84 female nurses with CLBP participated in the study. Forty-two nurses were in the intervention group with a mean age of  $32 \pm 8.2$  years and 42 nurses were in the control group with a mean age of  $31.5 \pm 7.4$  years. The majority of nurses in both groups were married (69% intervention and (78.6% control).

Table 1 shows the demographic characteristics of both groups at commencement of the study.

**Table 1. Demographic characteristic of intervention and control groups at initiation of the study.**

Demographic characteristic		Intervention group N = 42			Control group N = 42			test-T (P-value)
		Number	percent	Mean (SD)	Number	Percent	Mean (SD)	
Age (year)	20-30	24	57.1	32 (8.2)	24	57.1	31.5 (7.4)	0.79
	31-40	11	26.2		11	26.2		
	41-50	7	16.7		7	16.7		
Marital status	married	29	69	-	33	78.6	-	0.58
	single	12	28.6		8	19		
	widow	1	2.4		1	2.4		
Habitat	city	38	90.5	-	37	88.1	-	0.72
	suburb	4	9.5		5	11.9		
Sciatica Pain	yes	6	14.3	-	8	19	-	0.55
	no	36	85.7		34	81		
Education	diploma	8	19	-	8	19	-	0.84
	Upper diploma	2	4.8		1	2.4		
	bachelor	32	76.2		33	78.6		
Job position	supervisor	3	7.1	-	4	9.5	-	0.98
	nurse	31	73.8		30	71.4		
	assistant	4	9.5		4	9.5		
	Ancillary	4	9.5		4	9.5		
Income	good	3	7.1	-	4	9.5	-	0.78
	middle	37	88.1		37	88.1		
	weak	2	4.8		1	2.4		
Weight(kg)	-	-	-	63.7 (9.9)	-	-	61.9 (9.6)	0.41
Height(m)	-	-	-	1.6 (0.66)	-	-	1.6 (0.56)	0.21
Pain duration (year)	-	-	-	3.16 (2.9)	-	-	3.09 (2.8)	0.91
Treatment Duration (year)	-	-	-	0.4 (0.9)	-	-	0.7 (1.3)	0.23
Pain severity (VAS)	-	-	-	4.4 (1.5)	-	-	4.4 (1.9)	0.95

\*( $P \leq 0.05$ ) (Standard Deviation)

The mean and standard deviation of the psychological variables, including anxiety, stress and depression, are shown in Table 2. The mean differences of pain between groups at two time points of the study were assessed through T-test and paired T-test. The results are shown in Table 3. According to these results, the intervention

group had significant improvement in terms of anxiety ( $P < 0.01$ ), stress ( $P < 0.001$ ), and depression ( $P < 0.001$ ) compared with control.

Furthermore, as table 3 shows, there was a significant reduction in low back pain for the intervention group, compared to the control group ( $P \leq 0.05$ ).

**Table 2. Comparison of psychological variables between two studied groups.**

Psychological variables		Before intervention n = 42	3-month follow up n = 42
		Mean (SD)	Mean (SD)
Anxiety (0-21))	Control group	16.76 (3.29)	12.52 (4.12)
	Intervention group	17.73 (3.68)	9.76 (4.43)
	<b>T-test * (P-value)</b>	0.53	0.057
Stress (0-21)	Control group	14.16 (4.06)	16.28 (3.11)
	Intervention group	15.52 (4.93)	9.52 (4.73)
	<b>T-test (P-value)</b>	0.17	< 0.0001
Depression (0-21)	Control group	17.11 (3.83)	12.02 (3.37)
	Intervention group	17.66 (4.18)	10.45 (4.06)
	<b>T- test (P-value)</b>	0.20	0.004

\*(P ≤ 0.05) (Standard Deviation)

**Table 3. Comparison of pain severity between two groups at two time points.**

Variable	Group	Before intervention N = 42	3-month follow up N = 42	P-value (Paired T-test)
		Mean (SD)	Mean (SD)	
Pain severity	Control	4.45 (1.96)	4.78 (1.93)	> 0.05
	Intervention	4.47 (1.51)	4.09 (1.35)	< 0.001
<b>P-value (T- test)</b>		0.95	0.05	

\*(P ≤ 0.05) (Standard Deviation)

## Discussion

The aim of this study was to evaluate the role of psychological interventions on CLBP amongst Iranian nurses. According to the results from DASS, the participants in both groups initially experienced stress, anxiety and depression. This finding indicated that Iranian nurses living with CLBP might be more susceptible to psychological disorders. Existing evidence indicates that stress, anxiety and depression cause prolonged chronic back pain in nurses (Samani & Jokar, 2007; Mitchell et al., 2008). Therefore, conducting further research on Iranian nurses to confirm the predicting factors of CLBP is warranted.

This study showed that the stress score of the control group who did not receive a stress management intervention, increased after 3 months. However, the intervention decreased the stress level significantly in the participants who received the intervention. This finding reveals that stress management intervention is effective in controlling stress associated with CLBP among Iranian nurses. However, other evidence indicates that environmental and occupational stressors also lead to back pain in the workplace (Soklaridis, Ammendolia & Cassidy, 2010).

This study shows that the participants who complied with the stress management intervention and relaxation technique experienced significantly less anxiety and depression in comparison with those in the control group. Thomas and co-workers (2010) supported this result through their argument that relaxation techniques had a noticeable role in assisting patients to cope with daily stress and by reducing severity of pain (Thomas et al., 2010). In previous studies, it was indicated that the bio-psychosocial aspects of chronic pain can lead to more pain severity (Sikiru, 2010).

In our study we encouraged the participant to manage their stress, to do relaxation exercises, and to apply problem solving methods and coping procedures. We also insisted that the participants practice these skills daily. It seems that the psychological intervention in our study improves stress, anxiety, depression. These results are in the line with existing evidence (Vargas-Prada et al., 2012; Coggon et al., 2013). Limitations to this study include the use of clients self-report, and lack of control of confounding factors such as other interventions received by the participants. These factors should be controlled in future studies.

## Conclusion

The findings of this study showed that psychological intervention could reduce stress, anxiety, and depression as well as low back pain among Iranian female nurses. It is recommended; further research with larger sample sizes and longer follows up be conducted to confirm the findings of this study.

## Conflict of interests

The authors declare that they have no conflicts of interest.

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## Author contribution

MA; Study Importation, Data collection and analysis, writing the first draft of the Paper.

SST: Study design and data analysis, editing and confirming the final draft of the paper.

SN: Study design, confirming the final draft of the paper.

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