



EFFECT OF PATIENT EDUCATION COMBINED WITH PHYSIOTHERAPY TREATMENT ON FEAR-AVOIDANCE BELIEF IN LOW BACK PAIN SUFFERERS

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ABSTRACT

Fear-avoidance beliefs is one of the factors contribute to low back pain. The study was to determine the effect of patient education combined with physiotherapy treatment on fear-avoidance beliefs for low back pain using Fear-Avoidance Beliefs Questionnaire (FABQ). A quasi-experimental study with 100 participants was randomly assigned into 2 groups. The experimental group received the education and physiotherapy treatment whereas the control group only received the physiotherapy treatment. Both physical and work components of FABQ showed non-significant main effects on group respectively [$F(1, 98) = .36, p = .55, \eta^2 = .004$]; [$F(1, 98) = .88, p = .35, \eta^2 = .009$]. However, the study demonstrated minimal effects in the experimental group as compared to the control. This study might assist to reduce the fear-avoidance beliefs in low back pain.

KEYWORDS: Education, low back pain, fear-avoidance belief and physiotherapy treatment



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INTRODUCTION

Low back pain is one of the leading problems globally with the highest incidence among people aged 40-80 years¹. Pain experience may develop fear which closely related to avoidance behavior that leads to anxiety and the long-standing negative functional impact on individual or society². Fear-avoidance belief is about attitude and belief of a person following a previous experience of injury³. It can be measured based on the fear of physical activity and fear of work that interfere with current LBP problem⁴. Individuals who are in pain, tend to develop catastrophizing or a negative understanding that physical activity can cause harm, aggravates pain⁵ and re-injury⁶. Fear-avoidance beliefs are interrelated to the severity of LBP and can be measured using FABQ. It also appears as a predictor of the functional disability in daily routine activities^{7,8,9}, the time to return to work and the outcome of rehabilitation programs¹⁰. Current evidence suggests that psychosocial factors are important in predicting patients who will progress from an acute to chronic stage^{11,12}. Several studies showed that fear-avoidance beliefs may be the most important factors in the development of chronic disability in LBP sufferers^{13,14}. Physical impairments, psychosocial factors and self-reported disability were driven primarily by measures of pain and fear-avoidance beliefs¹⁵. Thus, physicians and physiotherapists should make a routine attempt to characterize the fear-avoidance beliefs of patients with LBP. High levels of fear-avoidance beliefs occur at the early stage of LBP in most patients^{7,10}. It is important for physiotherapists in the primary care to measure levels of fear-avoidance beliefs or pain catastrophizing in patients with LBP⁸. It was found that patients with less physical activity had significantly higher scores in fear-avoidance beliefs or medium or high pain catastrophizing⁸. A well-known educational booklet in the Europe known as "Back Book" had shown a significant beneficial effect on patient's beliefs and disability with non-specific LBP¹⁶. Burton's reported the significant differences in FABQ physical between the Back Book and control booklet at all measurement levels respectively. This booklet was developed with the purpose to

modify patients' beliefs and behavior towards more of positive thought¹⁷. The combined intervention with the support of advice and educational material would demonstrate a better effect¹⁸. The use of relevant information which guide the patients to change their beliefs and perceptions about low back pain would possibly minimize the fear related to physical activity. Therefore, this would promote better function and minimize disability. In contrast, another study using the Back Book combined with lumbar extension exercises and graded exercise did not show an impressive outcome for patients with acute LBP¹⁹. The results demonstrated that disability, fear-avoidance beliefs and pain decreased at four-week measurement but increased after six months. Currently, there is limited study addressing the issue of fear-avoidance beliefs in physiotherapy management for LBP which include patient education program. Thus, this study was conducted to determine the effect of patient education combined with physiotherapy treatment among LBP patients on fear-avoidance beliefs which include fear of physical activity and work.

MATERIALS AND METHODS

This study was approved by the Ethics Committee of Research, Universiti Teknologi MARA and Medical Research and Industry Secretariat of the Universiti Kebangsaan Malaysia Medical Centre (UKMMC). One-hundred participants were recruited from the Outpatient Physiotherapy Clinic in UKMMC who had been diagnosed with LBP. They met the inclusion criteria as follows: age between 20 to 60 years old, able to communicate and write in Bahasa Malaysia or English, able to follow instruction well and first time visit to the physiotherapy clinic for LBP. The participants were randomly assigned into experimental or control groups. The experimental group received education combined with physiotherapy interventions, while the control group received physiotherapy interventions only. The participants were required to sign the informed consent prior to the commencement of the intervention session.

They were also required to answer the FABQ before receiving the first treatment session. This questionnaire is a reliable and valid tool³ for measurement of fear and avoidance, which affecting patients with LBP. The FABQ was measured again prior to 5th session and after 8th session. The maximum score for FABQ work is 42 and FABQ physical is 24. The higher the scores the greater the fear and avoidance beliefs showed by the patient. All the reports were recorded and documented in the patients' file for confidentiality. The control group received physiotherapy interventions appropriate to their problem based on physiotherapist discretion such as thermal, joint mobilization and exercises. They received neither proper education session nor educational booklet. They were advised to continue their normal daily routine and sought medical care whenever necessary. They followed the appointment schedules with every two weeks interval for each session. The physiotherapists monitored their progress by performing subjective and objective examinations at every appointment session.

Meanwhile, participants in the experimental group were provided with education session that was conducted once at the first treatment session. The education session was conducted after they finished their physiotherapy treatments for that day. This program intended to provide information, promote understanding and create awareness related to LBP. The session was conducted in a room on one-to-one seminar basis. The series of education components were delivered starting with information of overview of LBP followed by understanding the anatomy of spinal column and physiology of

pain. Researchers also used various spinal models to facilitate the education purposes. Besides, the booklet was also given to enhance better understanding and promote regular exercises at home. Participants were encouraged to read and relate their current problem and the theory material in the booklet including anatomy of the spine and physiology of pain as well as the general information on LBP. They were instructed to perform all exercises recommended in the booklet at home. The exercises were illustrated with the photos and step-by-step instructions to ensure that it is easier to be followed. During the treatment session, the participants received the appropriate physiotherapy interventions which were similar to the control group. At the same time they were also advised to continue their daily activities as optimum as usual. The therapists supervised and monitored all the treatment given as well as recorded the progress in the patients' file where the confidentiality were maintained. Statistical tests included descriptive and inferential analyses. Repeated measures ANOVA were used to determine the time factor effects, group effects and interaction between group and time effects. All statistical calculations were completed using the SPSS software version 18 (PASW Statistics Data Editor) and level of significance was set at $p \leq .05$.

RESULTS

The detailed demographic characteristics of age, race, gender, duration of LBP, educational level, occupation and type of residence are presented in Table 1.

Table 1
Demographic Characteristics of Participants in main study (N=100)

Variables	Groups	
	Education: N=50 (%) N(%) m ± SD	Control: N=50 (%) N(%) m ± SD
Age	40.96±11.16	43.50±11.49
Race		
Malay	42(84)	44(88)
Chinese	6(12)	3(6)
Indian	2(4)	3(6)
Gender		
Male	20(40)	19(38)
Female	30(60)	31(62)
Duration of LBP		
<3 months	12(24)	12(24)
3-12 months	14(28)	16(32)
>12 months	24(48)	22(44)
Occupation		
Public sector	23(46)	28(56)
Private sector	27(54)	22(44)
Type of residence		
Single storey	11(22)	12(24)
Double storey	20(40)	18(36)
Flat/apartment/ condominium	19(38)	20(40)

The FABQ related to physical activity influences on low back pain showed some reduction of fear-avoidance beliefs from pre-test (15.42 ± 6.19), mid-test (14.8 ± 6.16) and post-test (14.17 ± 5.52) in the control group. However, the result showed an increase of fear-avoidance beliefs in the experimental group. The results are presented in Table 2.

Table 2
Result of Pre-Test, Mid-Test, Post-Test and Changes (%) Between Mid and Pre Tests, Post and Mid Tests and, Post and Pre Tests Following 8 Sessions Intervention on Physical Score in Fear-Avoidance Beliefs Questionnaire

	Pre-test (M ± SD)	% change Pre-mid test	Mid-test (M ± SD)	% change Mid-post test	Post-test (M ± SD)	% change Pre-post test
Experiment	13.6 ± 6.96	9.56	14.9 ± 6.87	-4.03	14.3 ± 6.71	5.15
Control	15.42 ± 6.19	-4.02	14.8 ± 6.16	-0.68	14.7 ± 5.52	-4.67

$p = .155$

Figure 1 shows FABQ Physical score in experimental group increased during mid-test and decreased at post-test. However, the control group shows a steady decline plot. Mauchly's test (0.968) indicated that the assumption of sphericity had been met, $\chi^2(2) = 3.15$, $p = .21$. The results showed a non-significant main effects for both group [$F(1, 98) = .36$, $p = .55$, $\eta^2 = .004$] and time [$F(2, 196) = .33$, $p = .72$, $\eta^2 = .003$]. The interaction between time and group were also not significant, $F(2, 196) = 1.88$, $p = .55$, $\eta^2 = .019$.

Linear Plot of Time Versus Mean Score of Fear-Avoidance Beliefs Questionnaire on Physical Score

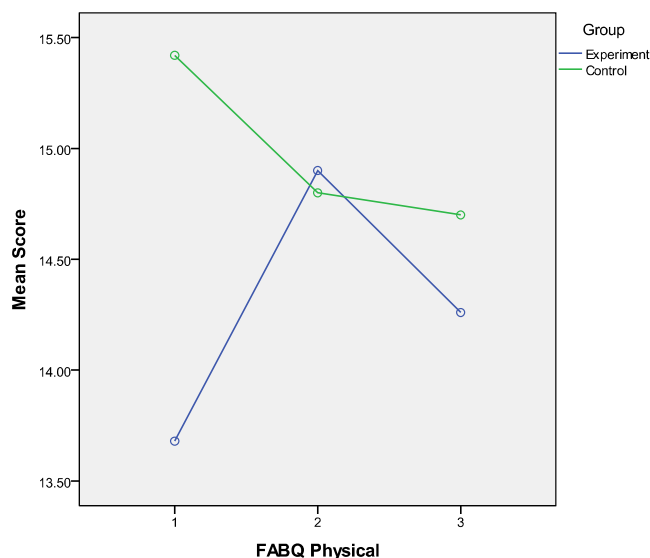


Figure 1

The FABQ Work score for experimental group showed some reduction of fear-avoidance beliefs (pre-test: 16.8 ± 10.78 ; mid-test: 16.02 ± 11.19 ; post-test: 15.78 ± 10.58). The control groups (pre-test: 18.24 ± 10.19 ; mid-test: 18.8 ± 10.82 ; post-test 17.38 ± 11.80) The results are presented in Table 3.

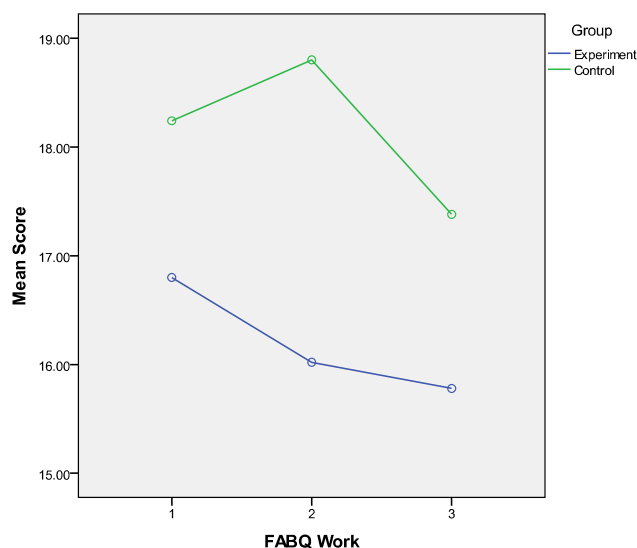
TABLE 3

Result of Pre-Test, Mid-Test, Post-Test and Changes (%) Between Mid and Pre Tests, Post and Mid Tests and, Post and Pre Tests Following 8 Sessions Intervention on Work Score by Using Fear-Avoidance Beliefs Questionnaire.

	Pre-test (M ± SD)	% change Pre-mid test	Mid-test (M ± SD)	% change Mid-post test	Post-test (M ± SD)	% change Pre-post test
Experiment	16.8 ± 10.78	-4.64	16.02 ± 11.19	-1.49	15.78 ± 10.58	-6.07
Control	18.24 ± 10.19	3.07	18.8 ± 10.82	-7.55	17.38 ± 11.80	-4.71

p = .287

Figure 2 shows a steady decline in FABQ Work score for experimental group. However, for control group, FABQ Work score increased during mid-test and decreased in post-test. Mauchly's test (0.794) indicated that the assumption of sphericity had been violated, $\chi^2(2) = 22.4, p < .001$. The results showed a non-significant main effects for both group [$F(1, 98) = .88, p = .35, \eta^2 = .009$] and time [Greenhouse-Geisser adjusted $F(1.66, 162) = 1.43, p = .24, \eta^2 = .014$]. The interaction between time and group were also not significant, Greenhouse-Geisser adjusted $F(1.66, 162) = .72, p = .46, \eta^2 = .007$.

Linear Plot of Time Versus Mean Score of Fear-Avoidance Beliefs Questionnaire on Work Score.**FIGURE 2****DISCUSSION**

This study demonstrated that education combined with physiotherapy interventions (thermal therapy, manual therapy, back exercises and home program or self-management exercises) resulted in a small reduction of fear-avoidance beliefs than physiotherapy management alone without education. Therefore, the results did not reflect any significant finding of the effect of education on fear-avoidance beliefs.

(i) Effect of education on FABQ Physical

The result of FABQ physical showed some reduction of fear-avoidance beliefs from pre-test to mid-test and post-test in the control group. One of the possible factors could be due to increase of physical activity of the participants at their workplace. From the demographic statistics, 54% of the participants in the experimental group were working in the private sector and 56% of them also involved prolong sitting in their work. Prolong sustained position in sitting or standing might increase pressure in the intervertebral disk of the spine. This would aggravate the LBP symptoms such as pain, radiating pain and numbness. Therefore, it might induce stress at the workplace and increase fear-avoidance beliefs

about work and physical. The patients might believe that increase physical activity may increase their pain and at the same time with strenuous physical activity it would influence their perception of fear. The results showed consistent findings with Coudeyre's study²⁰. However, their study assessed the fear-avoidance beliefs about physical component only. They recruited participants with sub-acute and chronic LBP who were hospitalized and referred to a rehabilitation unit. Those were differed from the current study where the participants were a mixture of acute, sub-acute and chronic cases who attended the outpatient physiotherapy department for management.

Another important reason for the insignificant findings in fear-avoidance beliefs physical and work is that no specific fear-avoidance training was introduced in the study. The specific training such as specific cognitive therapy for fear-avoidance or graded activity with proper diary documentation would be beneficial to facilitate a better fear-avoidance management. Perhaps with proper training the study would demonstrate a better significant result. Moreover, the education session was only conducted once which was

on the first session throughout the eight treatment sessions. However, they were reminded to read and follow the exercises which had been prescribed in the booklet. They were solely dependent on their self-initiative and self-motivation to read the provided information. Thus, this might contribute to the non-significant result between the groups. This could be because of the 2nd and 3rd measurements were only taken before 5th treatment and after 8th treatment sessions respectively. Therefore, the result of the 2nd and 3rd measurements perhaps reflect more on the effect of physiotherapy treatments rather than the education. At the end, the result showed a similar effect on both groups.

(ii) Effect of education on FABQ Work

The finding of FABQ work showed a small percentage of mean difference between post-test and pre-test in both groups. The current results possibly due to the mixture of patients with acute, sub-acute and chronic LBP. Therefore the result doesn't reflect the obvious positive effect of education on fear-avoidance beliefs. If the sample is categorized by specific LBP groups, the result could be much better at showing the constructive effect of education on fear-avoidance beliefs²¹. In addition, the education session was only conducted once in 8-session which was a minimum number of delivery that may not be sufficient to evaluate the effect of education on the psychological aspect like someone's belief²². The whole duration for one participant to complete the study was 16 weeks which was a satisfactory period for recovery to occur. It could be possible that if the session of the education would be more frequent - probably weekly or fortnightly, the effect of education could be better presented²³. Moreover, the participants were engaging with their normal routine of their job which involved a variety of job scope ranging from light duty to heavy duty, and of course there are some other factors like stress, work environment, relationship with

peers which may influence their perception and beliefs²⁴. This either directly or indirectly may affect the result of the study.

CONCLUSION

Overall, education combined with physiotherapy management showed minimal reduction on fear-avoidance beliefs about work better than control in LBP patients but not in fear-avoidance beliefs about physical activity. Nevertheless, the results didn't demonstrate a significant difference between the groups. The education itself was lacking of the component that promotes the importance of physical and work that related to fear. Besides, monitoring on how the patients' answered the questionnaire was also limited due to time constraint and short of physiotherapists in the physiotherapy outpatient department compared to the number of patients attended for management at one time. Although there was no significant difference between education and fear-avoidance beliefs in LBP patients, the result still show small reduction changes. Future studies are needed to explore the effects of education on fear-avoidance beliefs in longer duration. Perhaps, the education should include the specific component that related to fear-avoidance belief and fear-avoidance training management.

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CONFLICT OF INTEREST

Conflict of interest declared none

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