

Literature review of biopsychosocial model of back pain



The bio psychosocial model is now widely accepted for the diagnosis and the management of multifaceted nature of pain. The bio psychosocial model of pain presents an integrated view of biological, psychological and socio cultural factors, which could occur in pain (Jull and Sterling 2009).

Seventy-five percentages of individuals in the western world during their lifetime affected with acute or chronic low back pain, which leads to major cause of disability (Kirk et al. 2005). " Low back pain must be considered as a bio-psycho-social syndrome that consequently requires a multidisciplinary bio-psycho-social treatment approach." (Negrini et al . 2008, p. 55).

The result of a dynamic interaction between psychological, social and pathophysiological factors of chronic pain makes difficulty for the individual patient to determine the pre-eminent factor in his experience of chronic pain, which emphasizes the importance of bio-psycho-social treatment approach (Kirk et al. 2005). European guidelines also recommend the bio-psycho-social treatment approach for the treatment of chronic low back pain (Balague et al . 2007).

1. 1 Rationale behind investigating this topic.

In clinical area of practice, low back pain is a common health problem for both healthcare professionals and patients, which reflect the thought to find out the role of bio psychosocial perspective in assessment, diagnosis and treatment of chronic low back pain. This would lead us to better understanding of low back pain and pain in general.

The aim of this assignment is to critically evaluate the available evidence regarding biopsychosocial model in relation to chronic low back pain. It will <https://assignbuster.com/literature-review-of-biopsychosocial-model-of-back-pain/>

also reflect on clinical practice, taking into account the principles of evidence based practice.

2. 0Literature review

A literature search was carried out using the Science direct, Pub Med, Medline, Ovid, Cochrane and Google Scholar was undertaken for relevant studies in the last 5years and then extended into 10 years . the initial search did not yield enough evidence for assignment aim. The keyword search included : bio psychosocial approach, chronic low back pain, psychosocial factors, mood disorders and combination of key word also used. The search was limited to studies published in English and conducted in human beings.

The strength of evidence was established using the Sackett's hierarchy of evidence (1997) (Please see appendix 1). Each of the papers were analysed for validity and rigour according to the framework given by (Rees 1997, cited in Taylor 2009). (Please see appendix 2).

Case history to relate to bio psychosocial model into clinical practise.

Mrs smith 35 year old mother of one child, a health professional has been suffering from chronic back pain since 2006 to2008, who feels so depressed as she has some family problems (son was sick with heart problem) and problems with her manager at work (never agreeing with shift adaptation to look after the child). She went to see her GP and complete medical assessment was negative, started on analgesics . The conflict existed, which lead her into severe depression. In 2009 she went see a psychotherapist. The manger agreed with her job flexibility to look after the child, by the time

child's condition improved lead her to less frequent and less intense episodes of pain.

Like many other patients the patient had never considered the possibility of psychological or social factors for two years, which could contribute to her chronic pain. Mrs smith she was told by psychotherapist that any biological reason together with psychosocial concerns can exacerbate the experience of pain and she realized the contributing psychosocial factors to her pain gradually. As she was a health care professional she started to use coping mechanism effectively with the help of psychotherapist, which helped her to control her stress with subsequent less intense episodes of pain. In the light of the above case, one of the reasons that her medical treatment had failed to respond is because of the underlying psychosocial factors have been left un-addressed.

The health care professionals should understand and exploit the bio psychosocial approach to the management of chronic pain will provide effective treatment modality for patients.

The bio psychosocial model relates to chronic low back pain: Evidence from studies

A systematic review of randomised controlled trials conducted by George (2008) , to evaluate the effectiveness bio psychosocial approach for the management of chronic back pain . The study also aimed to evaluate the role of individual physiotherapist in bio psychosocial approach for treating for chronic back pain

The result of the review was supporting bio psychosocial approach . The sample studies were 9 randomised control studies, where individual physiotherapist has major role in intervention.

George (2008, p. 4)

The result demonstrated significance $p < .05$ in eight studies. Six studies reported the effect size and large effect of reduced disability found except in one study.

The NNT odds ratio reported also showed clinical significance for the result.

Compared results of different studies established generalisability and consistency (lack of heterogeneity) of study findings. The included studies were experimental studies and systematic review of experimental studies where intervention provided by individual physiotherapist with minimal support from other health professionals. These studies were concentrated only to chronic back pain treated with psychosocial interventions in adults. The inclusion criteria for selected studies for the review was specific to question set for review, which contributed to get a reliable and accurate result from the review. The selected studies were scoring high to moderate quality on PEDro(physiotherapy evidence data base) appraisal tool, which can provide quality data to support the validity of the result.

The interventions carried out in these studies differ from basic physical therapy treatment, which highlights importance of the capability of individual physiotherapist. The generalisability of these finding needs to consider as all care settings does not have trained physiotherapist who can provide

interventions to achieve bio psychosocial approach in chronic back pain management. The search strategy identified 99 potential sample studies and the final sample was only 9 randomised control studies after filtration through the inclusion criteria. There is potential chance of bias through objectivity as because there is chance for choice of articles to support the author's viewpoint.

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The review gives the strong evidence for the bio psychosocial approach for the management of chronic back pain. The similarity or homogeneity of studies involved in this review broadening the applicability of bio psychosocial approach by an individual physiotherapist who has appropriate knowledge and capability to carry out the interventions

The study reported that individual physiotherapist who manages the bio psychosocial approach for the treatment of chronic back pain is effective as multidisciplinary management of chronic back pain . As it sounds cost effective and may more feasible for patient because of one to one interaction further research must be essential to promote individual physiotherapy approach.

. Waxman et al. (2008) conducted an observational study to examine the impact of psychosocial factors in chronic back pain patients and their relationship satisfaction.

The observed sample included was 24 men and 30 women (N= 54) with chronic low back pain who were married or cohabitating and were recruited through chronic pain clinic.

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The finding from the study reported that depression and negative partner response have significant impact on relationship satisfaction among chronic back pain patients.

Table: 2

Standardized regression (Path) Coefficients of mediational models with psychosocial variables as mediators of pain and relationship for total sample (Waxman et al. 2008, p. 438)

The total effect of pain on relationship satisfaction was significant, $B = -.32$, $p < .01$

The association between pain and depression was significant $= .63$, $p < .01$

Indirect effect of pain on relationship satisfaction through depression was significant

$= -.21$, $p < .05$. This proves the mediating role of depression for pain and relationship satisfaction.

The relation between pain and negative responses was significant $= .38$, $p < .01$ the association between negative response and relationship satisfaction when controlling the pain was also significant $= -.49$, $p < .01$.

The indirect effect of pain on relationship satisfaction through negative response was significant indirect effect $= -.20$, $p < .01$

From this significant evidence reveals that negative response by partner is also a mediator of pain and relationship satisfaction

The study reported significant evidence to reveal the relation between various components in bio psychosocial model which include pain(bio), relationship satisfaction(social) depression(psycho) perceived negative response(psychosocial) .

(SeeAppendix: 5)

Reflecting the study back to the case of Mrs smith It's not clear about her partners involvement in her treatment, but she was showing signs and symptoms of depression which might contributed to the chronic nature of pain. The study result underscores the importance of partner involvement in patient's pain assessment and treatment the study. In clinical practise there is a need to promote education programme for partners of patients with chronic back pain as part of treatment plan to achieve bio psychosocial approach. When reflecting this finding to clinical practise which explain the reason why the widow or patients who lives alone are more vulnerable candidates for the chronic nature of the pain.

These finding consistent with previous following study results . Future research need to consider to compare self reported data from both patients and partners to know the response and behaviours that related to pain.

The ethical consideration was done on study as the study was approved by the local IRB, and written consent was obtain from patients as a proof or

willingness also promotes the strength of the study. The reliable tools used for data collection was rigor to the study.

The recruitment method for sample selection was based on self selection which can contribute to selection bias, which can affect the rigor of the study. The patients who has greater pain and psychological symptoms may not take initiative to participate in the study.

The results in this study were based on self-reported outcomes from the questionnaires that were sent to the patients, which makes the data subjective and are most likely to be true and contribute to the rigor of the study, can promote the rigor of the study.

The study also reported that the approximate time for completion of questionnaires was 45 minutes. The reliability of data can affect because of length of time especially these patient who are with pain and psychological symptoms.

The study is ranked as class 3c on the hierarchy of evidence considering the design and methods employed in the study.

The evidence reaffirms the bio psychosocial model for assessment and treatment of chronic back pain.

Tang et al. (2008) conducted an experimental study to examine effects of mood on pain responses and pain tolerance in chronic back pain patients.

The recruited sample was 55 patients suffering from chronic back pain aged between 18-65. The patients were randomly allocated into three groups ,

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depressed group: 18, neutral group¹⁹ elated group: 18. The the participants were asked to perform a baseline task (reading magazine) to establish a baseline for mood and pain ratings. An artificial mood was induced to participants (musical mood induction) and followed by pain provoking task (holding a heavy bag) to assess the pain rating and tolerance.

The study result proved that the participants with depressive mood showed high pain ratings and lower pain tolerance at rest, but happy mood induction resulted in lower pain ratings and higher pain tolerance.

The table: 3 shows that depressive mood positively correlated with increase in pain ratings (Tang et al. 2008, p. 399)

The participants were manipulated to examine the effect of artificially induced mood on artificially induced pain which may affects the reliability result when it apply into real mood and pain of chronic back pain patients. Even though researcher adapted a pre-determined mood change criteria to judge the effectiveness of mood on the participants during the study. This can contributed to rigour to study and it can promotes the reliability of the result.

The sample population was aged between 18-65, tolerance of induced mood and pain may not be same between these age groups . The difference in sex also can affect the mood and pain tolerance. The Researcher failed to mention about the method of randomisation to overcome confounding factors. Blinding not performed and can affects the performance bias

The study design was experimental design which comes under level 1a in hierarchy.

This study also proved that music therapy is effective to improve pain and pain tolerance in chronic back pain patients. It agrees with (Guetin 2005), music therapy is a effective complementary treatment in chronic back pain associated anxiety-depression and behavioural consequences. Future research needs to consider for evaluating the effectiveness music therapy as part of multidisciplinary rehabilitation.

Bio psychosocial approach for assessment helps to identify the matching treatment for patients based on their characteristics and refine the focus of treatments and achieve effective outcome.

Even though there are weaknesses for this study it proved that mood can influence the pain. The result is consistent with Waxman et al.(2008) discussed in previous study. These studies highlights the importance of cognitive behavioural therapy in bio psychosocial rehabilitation for chronic back pain patients NICE(2009).

Mitchell et al. (2009) conducted a cross sectional study to evaluate the role of personal bio psychosocial factors on low back pain, in nursing students. The results proved that modifiable life style, psychological, physical factors were relates to low back pain in nursing students. One hundred and seventy undergraduate nursing students from two university nursing schools of western Australia were enrolled for this study.

The study compared three groups of students (no LBP group, mild LBP group, significant LBP group) and reported that students with significant low back pain were more physically active compared to no low back pain group. The DASS total score and stress subscale score were higher in significant low back pain group compared to NO LBP group. The study also reported that social measures did not influence their pain intensity.

The study result mentioned that the social measures including household income and smoking did not affect the significant low back pain patients. This cannot be generalized into general population types, as it conducted on healthy university sample may not be much influenced by social factors. There are contrasting findings which mention the relation between low back pain and social measures (Shiri et al. 2009)

Study gives the evidence for sufficient statistical power and ethical consideration. The researcher used triangulation in data collection, which overcame the limitations of a single method of collecting data and hence increased the validity of the results. The results of this study were based on self-reported (questionnaire) outcomes that were collected from patients. It can contribute to validity of the results, because they are more subjective and most likely true. The inclusion criteria on sample selection was appropriate to focus bio psychosocial approach in chronic back pain patients, as the criteria excluded patients with inflammatory disorders, neurological or metastasis disease, pregnancy or less than 6 months postpartum.

The study was conducted as cross sectional study which classified in to class 3c on level of evidence., and researcher failed to include other factors like fear avoidance and genetic factors.

This study was carried out in the Australia and their socio cultural factors and life style may differ from United Kingdom , decreasing the accuracy of reproducing these results to UK practice. Even though study result is consistent with other studies conducted in united kingdom .

In the area of practice physical and psychosocial factors has important role on experiencing low back pain among healthcare professionals and potential candidates, which reflects the necessity of education related to stress management such as relaxation techniques and meditation and mandatory manual handling training. Job stress and fear related to pain are mediators to inability to return to work Gheldof et al.(2005)

The high prevalence rate of low back pain highlights the importance of targeting prevention interventions among healthcare professionals and patients. The case study of patient discussed has not had much benefit from the conventional treatment pattern and showed clear evidence of personnel and psychological factors that can contribute to pain. The understanding of bio psychosocial factors helps to find out cause diagnosis treatment and prevention of chronic back pain

Suprina (2003) conducted a case study to discuss the efficacy of bio psychosocial model.

The sample for this study was a 32-year-old woman who suffers from chronic back pain for almost ten years and study reported that bio psychosocial model helps the women for successful reduction of symptoms. This study also proves that single practitioner can plan bio psychosocial model for the treatment of chronic back pain. The researcher reports that the treatment can be more effective when implementing one person integration model than multidisciplinary approach as it has easy access to patient also saves money and time. This study classified under level 3d as this is a study of only one individual. There is chance of performance bias as the subject blinding done in this study . Even though it is individual case study it agrees with widely accepted bio psychosocial model. The study reveals that all health professional should consider individual patient as one with complex behaviours and emotions and not just organism with physiological changes . The researcher who conducted this study in United states is supporting the one-person integration model, practicability of this one- person integration model in United kingdom's clinical practise is questionable because the way of clinical practise may vary in different countries.

The current trouble within heath care system in European countries is relegate mainly to biomedical perspective and not considering psychosocial aspects because of time constrict and inadequate training. Mauksch (2005) compared the current state of bio psychosocial approach to a dormant seed, which is sitting on the shelf, which need to be watered with bio psychosocial education by health care professionals and placed in an environment fertile with bio psychosocial practise.

The knowledge about bio psychosocial approach helps healthcare professionals for better assessment and treatment of patients, which also agrees with case study discussed.

Currie and Wang (2004) examined prevalence and correlation between major depression and chronic back pain. The data collected from 118, 533 household residents from Canadian community health survey . The study result showed that low back pain is significant factor as a predictor for major depression (Fig: 1).

Individuals with severe pain intensity represented highest risk of major depression(odds ratio, 1. 61; 95%confidence interval L: 1. 34-1. 97; $p < 0. 05$).

Fig1: Prevalence of major depression(MD)in persons with chronic back pain stratified by pain severity . Currie and Wang (2004, p. 55)

The study also proved that individuals with chronic back pain and major depression were younger and they were more likely to be single and younger. The personal factors play an important role for contribution to low back pain which agrees with Mitchell et al. (2009).

The episode of depression were measured by WHO'S fully structured diagnostic interview, Composite International Diagnostic Interview -Short Form for depression. Which produce internal validity to the study.(scott et. al.(2000),

The study mentioned that this is the largest sample size(118, 533 residents)ever used in population -based study of chronic pain and

depression. This sample size from national population health survey gives <https://assignbuster.com/literature-review-of-biopsychosocial-model-of-back-pain/>

power to the study and promotes the reliability and generalisability of the results. The sample included in the study was aged from 12 years . As age, gender and cultural factors have an influence on level of perceived pain and influence of depression, these are important factors to consider to avoid selection bias and to make the study rigorous. The researcher used multi staged stratified random sampling procedure in the study would have added rigor to the study.

The population for this study was from Canadian community health survey.

As we discussed cultural factors and personal factors has influence in experiencing pain and depression in individual, reflection of the results into United Kingdom population may be not accurate. Even though study result is consistent with other studies conducted in United Kingdom

The study was conducted as cross sectional study which classified in to class 3c on level of evidence

Mrs smith case report also illustrates signs and symptoms of depression, which could contribute to her chronic back pain. She was lacking multidisciplinary bio psychosocial rehabilitation in her treatment. “

Multidisciplinary bio psychosocial rehabilitation with functional restoration reduces pain and improves function in patients with chronic low back pain”(Lang et al. 2003, P. 270), (Demoulin et al. 2010).

Woby et al.(2007)aimed a study to determine the relation between cognitive factors and level of pain and disability in chronic back pain and reports that pain intensity and disability strongly related to cognitive factors .

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The sample selected for the study was 183 C L B P (chronic low back pain) patients with onset of back pain > 3 months who had been referred to an physiotherapy rehabilitation programme which underpinned by cognitive-behavioural principles and revealed that higher levels of functional self-efficacy ($b = 0.40$; $p < 0.001$) and lower levels of catastrophizing ($b = 0.21$; $p < 0.01$) were related to lower levels of pain intensity.

The researcher used triangulation in data collection, which overcome the limitations of a single method of collecting data and hence increased the validity of the results. As all data collected by self reported measures the validity of data can be affected by social desirability. The selection bias in sample selection needs to be considered because patients selected for study was from rehabilitation programme, who had been referred to cognitive behavioural based intervention. It indicates that sample may be already affected with psychosocial factors, which can affect the validity of the result. The results suggest that psychosocial factors should consider as integral facet for treatments for chronic low back pain.

The cause of chronic pain in case Mrs smith should have been identified by the team involved in her care than trying to alleviate her suffering through the conventional treatment like pain killers. The pathway in fig: 2 explaining Mrs smith painful experience, disability and its recovery, which also agrees with the Woby et al. (2007) study results. Mauksch (2005) reported that average visiting length between physician and patient is highly stressed for 15 minutes in primary care system in European countries, which may possibly happened with Mrs smith case, which emphasis the need of the

adequate structured training to all healthcare professionals to practise bio psychosocial model with in limited time.

Fig2: Revised fear-avoidance model incorporating the mediational role of functional self-efficacy (Woby et al. 2007, p. 716).

The health care professionals should understand that the psychosocial factors are very important prognostic factors in the prediction of chronic pain and disability.

2. 3 Bio psychosocial model can promote patient satisfaction -evidence from study

Margalit et al.(2004) conducted a experimental study to find out the effect of bio psychosocial approach for patient satisfaction in their care. The study confirms that bio psychosocial model approach can reduce the heath care expenditures and can promote patients satisfaction.(Table: 2, appendix: 6).

The study sample was 44 general practitioners randomly selected from 523 practitioners who works with North Israel district. Again researcher used randomisation to allocate teaching methods, which gives rigour to the study. In this study he compared pre teaching effect and post teaching effect of two teaching interventions with two groups of general practitioners. The first method (didactic) consisted with reading assignments and lectures. The second method consist (interactive) consisted with role-play and group discussions. The result reported that the interactive teaching method elicited higher patient satisfaction.

Finestone et al. (2008) included a set of suggestion for physician to introduce bio psychosocial model in his study. Fig: 4(Appendix: 3).

There are limitations to this study. The method of randomisation is not mentioned on this study. The researcher highlighted the reasons for dropouts of patients from study but not mentioned anything about intention to treat analysis. Even though recruited sample were consented, the researcher did not request approval from institutional review board. There is chance of bias through Hawthorne effect because subjects known that they are video taping for the study. It is worth mentioning that the study is conducted in Israel and application of the results to UK clinical practise needs to consider as their teaching method may differ.

This study highlights the importance of interactive assessment to achieve bio psychosocial model treatment. Future researches are needed to support this study result and apply to UK clinical practise.

3. 0 Conclusion:

The systematic review conducted by George (2008) reported after that bio psychosocial approach for assessment and treatment of chronic back pain can make the successful reduction of symptoms . This study result also agrees with Suprina (2003) and Margalit et al.(2004) which reported that the approach can reduce the health care expenditures and can promote patients satisfaction . these studied also proved that single trained practitioner can achieve bio psychosocial model for the assessment and treatment of chronic back pain.

Tang et al. (2008) , Currie and Wang (2004) and Waxman et al .(2008)also reported the same fact which explains the relation between depression and pain intensity. Depression can significantly leads to higher pain ratings and higher pain ratings can also leads to severe depression. The studies also proved that psychosocial factors like fear avoidance behaviour, stress , negative responses by a partner and cognitive factors are contributing to chronic back pain. The cross sectional study conducted by Mitchell et al. (2008) reported that modifiable personal factors like lifestyle, physical sctvity can contribute to low back pain.

After extrapolating the results and considering the nature of the studies, the findings suggest that bio psychosocial factors have important contribution to low back pain. One of these factors could trigger the other and vice versa. In practice, it is difficult, rather impossible, to dissociate one factor from the other, which emphasizes the importance of bio-psycho-social treatment approach.

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