Prevalence of depression among chronic back pain patients attending district hospital in Malaysia

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General Note

♻ Article is recommended to print as color digital version in recycled paper.

ABSTRACT

Background: It is generally agreed that the relationship between chronic low back pain and depression is bidirectional. Depression can complicate the management and interfere with recovery in chronic back pain and similarly, chronic back pain can induce depression. Often if patients with depression are not managed, their back-pain morbidity may be prolonged. *Objective:* The purpose of this study was to assess the prevalence of depression among different ethnic groups with chronic low back pain (CLBP). *Methods:* A cross-sectional prospective study was done on clinically diagnosed CLBP patients attending orthopaedic clinic at Hospital Tuanku Jaafar, Seremban, Malaysia over twelve months between July and December 2019. The convenience sampling was used to recruit study participants. The Ministry of Health (MOH) pain scale and Patient Health Questionnaire (PHQ-9) instruments were used to identify the severity of pain and depressive symptoms and to obtain socio-demographic. SPSS was used to evaluate the relationship between demographic factors, pain, and depressive symptoms. *Results:* A total of 100 patients with CLBP comprising 71 females and 29 males participated in the study. About 68% scored positively on the PHQ-9 with 40% having moderate to severe rating scores. The risk of depressive symptoms increased with the severity of pain. 77.8% of the studied population with severe CLBP experienced depressive symptoms. Among the different ethnic groups, the prevalence of depression in Indians was 83.3%, while it was 58.2% among Malays. *Conclusion:* This study shows that two-thirds of patients with CLBP have depression, and the prevalence is low in Malays as compare to other races.

Keywords: Chronic back pain, depression, ethnicity, Malaysia, prevalence

1. INTRODUCTION

Chronic Low back pain (CLBP) is a common and economic health problem affecting people worldwide. It is estimated that 70–85% of the population experience at least one episode of low back pain at some time during their lives (Andersson, 1999). CLBP is referred to as the pain and stiffness lasting for three months or more and localised between 12th rib and inferior gluteal fold (Rosenberg, 2008). Depression, on the other hand, is currently one of the leading causes of morbidity globally with more than 264 million people affected (James et al., 2018). Both CLBP and depression are recognized as the main causes of disability globally (Vos, 2015). CLBP and depression have been shown to be biologically linked since the 2000s where studies showed that serotonin and norepinephrine are the neurotransmitters that play a huge role in influencing both pain and mood (Trivedi et al., 2004). Therefore, the imbalance of neurotransmitters can result in both pain and depression. It has been postulated that depression plays an important role in progressing to chronic disease and might have unfavourable effects on its prognosis (Kendall, 1999). Therefore, early recognition of depression which has a significant influence on the outcome of CLBP will help in its management (Truchon, 2001).

This study aimed to estimate the prevalence of CLBP associated with depression in patients with different ethnic backgrounds attending district hospital in Malaysia.
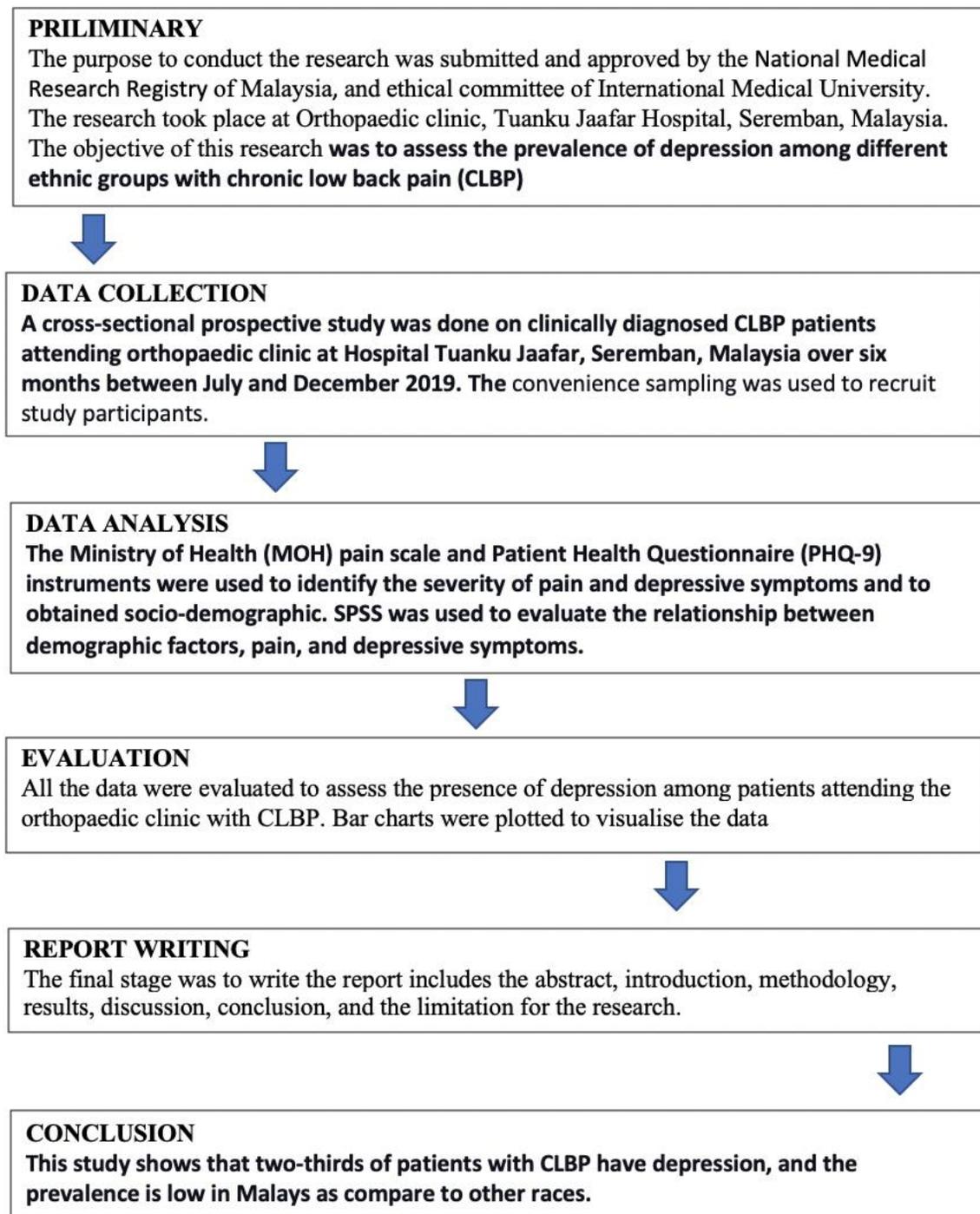
2. METHODOLOGY
Participants and methods
Study Design
A cross-sectional study was conducted from July to December 2019 at the Orthopaedics Clinic, Hospital Tuanku Jaafar, Seremban (HTJS). A total of 148 patients, all Malaysian, with CLBP were approached and 100 agreed to participate. Thirty patients refused

because they were not keen to participate in the study and 18 did not meet the inclusion criteria.Patients who were younger than 18 years old, non-Malaysian, and experienced back pain for less than 12 weeks were excluded.

Flowchart for Study Methodology on Prevalence of depression among chronic back pain patients attending district hospital in Malaysia : A Cross-Sectional Study

PRILIMINARY
The purpose to conduct the research was submitted and approved by the National Medical Research Registry of Malaysia, and ethical committee of International Medical University. The research took place at Orthopaedic clinic, Tuanku Jaafar Hospital, Seremban, Malaysia. The objective of this research **was to assess the prevalence of depression among different ethnic groups with chronic low back pain (CLBP)**

DATA COLLECTION
A cross-sectional prospective study was done on clinically diagnosed CLBP patients attending orthopaedic clinic at Hospital Tuanku Jaafar, Seremban, Malaysia over six months between July and December 2019. The convenience sampling was used to recruit study participants.

DATA ANALYSIS
The Ministry of Health (MOH) pain scale and Patient Health Questionnaire (PHQ-9) instruments were used to identify the severity of pain and depressive symptoms and to obtained socio-demographic. SPSS was used to evaluate the relationship between demographic factors, pain, and depressive symptoms.

EVALUATION
All the data were evaluated to assess the presence of depression among patients attending the orthopaedic clinic with CLBP. Bar charts were plotted to visualise the data

REPORT WRITING
The final stage was to write the report includes the abstract, introduction, methodology, results, discussion, conclusion, and the limitation for the research.

CONCLUSION
This study shows that two-thirds of patients with CLBP have depression, and the prevalence is low in Malays as compare to other races.

Figure 1 Flow chart

Study Instruments

This study was done by performing a one-to-one interview with the participants. They were informed about the purpose of the study and were given i) A questionnaire to obtain Socio-demographic data, ii) Ministry of Health, Malaysia pain scale to assess the

severity of the participants' back pain and iii) Patient Health Questionnaire-9 (PHQ-9) to evaluate the severity of depression. The standardized questions were asked exactly as phrased in the questionnaire form that was given. The questionnaire included demographic data (age, gender, ethnic, marital status, highest education level, employment status, history of depression in the past, family history of depression and duration of their back pain). The MOH pain scale is a visual analogue scale that defines the severity of pain as follows: mild, 1 to 3; moderate, 4 to 6; and severe, 7 to 10. PHQ-9 is a self-report screening tool for depression (Kroenke et al., 2001) and a validated Malay-language version was used for patient's ease (Sherina et al., 2012). Kronenke et al. (2001) have described the severity of depression on a score from 0 to 27. The score of 0-4 regarded as none, 5 to 9 as mild, 10-14 as moderately severe while 20 to 27 is considered as severe. A score of ≥ 10 has 88% sensitivity and 88% specificity for depression. A meta-analysis found similar 88% sensitivity and 85% specificity (Levis et al., 2019) (figure 1).

Data analysis
Data derived was entered to Statistical Package for Social Science (SPSS) version 25 for statistical analysis.

3. RESULTS
One hundred patients participated in the study. There were 71% female and 29% male with a mean age of 46.62 years. There were 55% Malay, 21% Chinese, and 24% Indian. 4% of participants had no formal education. 14% completed primary education, 43% completed secondary education and 39% completed higher education. About 46% of participants were employed while the other 54% were unemployed. Among the participants, 18% had a previous history of depression and 9% had a positive family history of depression. In our study, 9% experienced CLBP for 3 to 6 months, 12.0% experienced CLBP for more than 6 months to a year and 79.0% experienced CLBP for more than a year (Table 1).

Table 1 Sociodemographic characteristics of studied population with presence of Depression (n=100).

Characteristics	Frequency (n)	Presence of depression (n)	p value
Age Group			
Youth	36	14	0.974
Middle Age	45	18	
Elderly	19	8	
Gender			
Female	71	28	0.857
Male	29	12	
Ethnicity			
Malay	55	16	0.020[a]
Chinese	21	9	
Indian	24	15	
Marital Status			
Married	84	32	0.373
Unmarried	16	8	
Attended formal education			
No	4	4	0.012[a]
Yes	96	36	(OR: 0.067)
Employment Status			
Employed	46	17	0.566
Unemployed	54	23	
Previous History of Depression			
Yes	18	11	0.043[a]
No	82	29	(OR: 2.87)
Family History of Depression			
Yes	9	6	0.087
No	91	34	(OR: 3.35)
Duration of CLBP			
< 1 year	21	9	0.764
≥ 1 year	79	31	
Severity of Pain			
Mild Pain	14	1	0.000377[b]

Moderate Pain	41	12	
Severe Pain	45	27	
Presence of Severe Pain	45	27	0.000222[b] (OR: 4.85)

[a] Statistically significant factors, p<0.05

[b] Statistically significant factors, p<0.001

The average pain score of the studied population was 5.9 with 14% experiencing mild pain, 41% experiencing moderate pain, and 45% experiencing severe pain. The average PHQ-9 score was 9.0, where 28% felt mild depressive symptoms, 20% moderate depressive symptoms, 12% moderately severe, while 8% experienced severe depressive symptoms. Overall, 40% had depression according to the PHQ- score, (Figure 2).
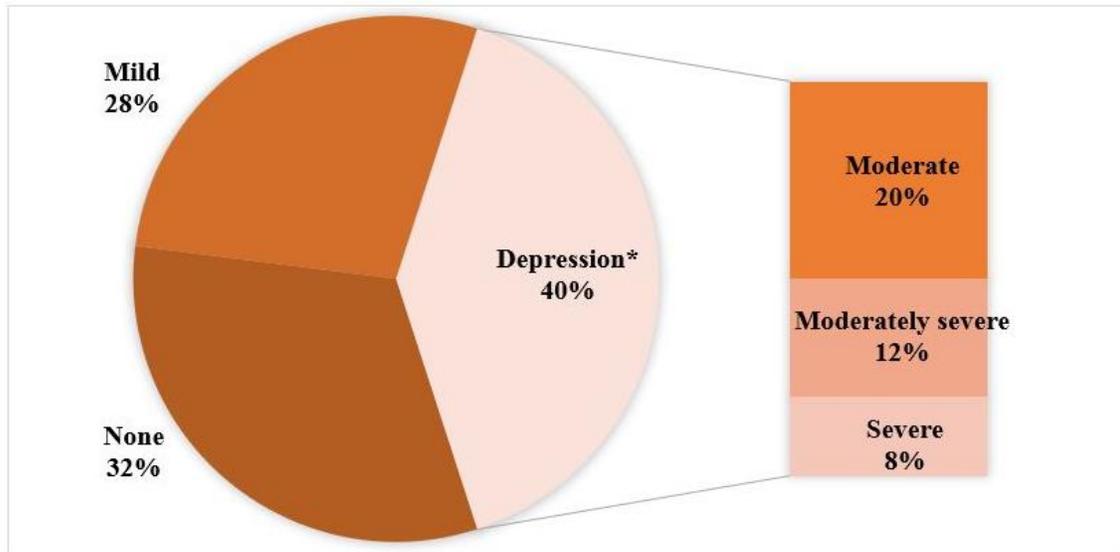
*Participants with depression (according to score on PHQ-9)

Figure 2 Severity of depressive symptoms in the studied population
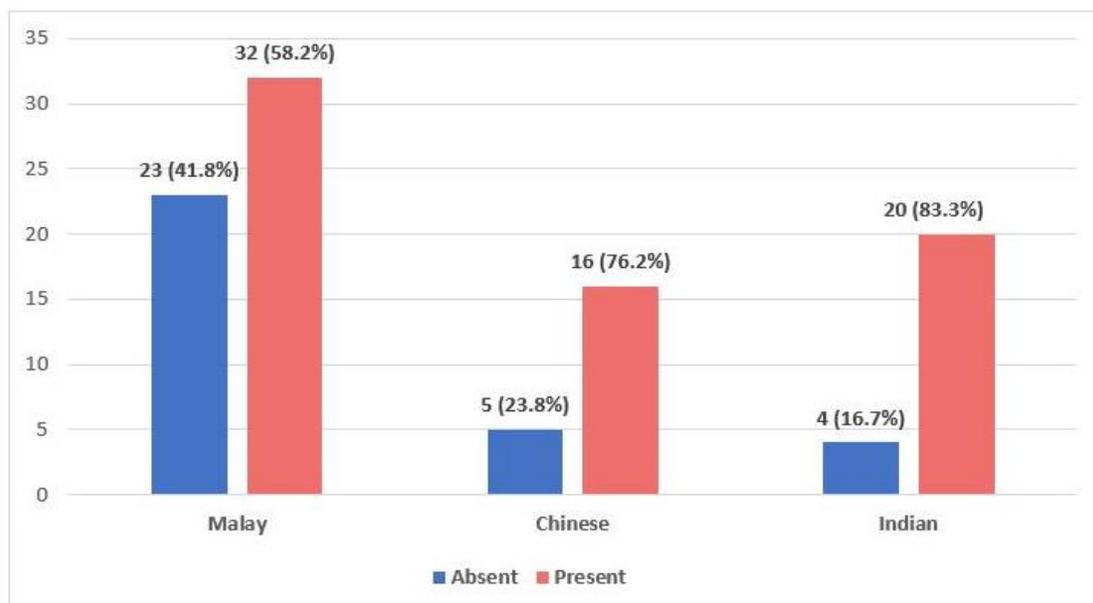
Figure 3 Relationship of race and presence of depressive symptoms in the studied population with chronic lower back pain.

Figure 3 represents the relationship between different ethnic groups and the presence of depression and found statistically significant (p<0.05). It shows the highest prevalence of depression among Indians (83.3%) and lowest in Malays (58.2%). Absent of formal education and previous history of depression also found statistically significant.

We also found a statistically significant (p<0.001) relationship between the severity of pain with depression and the presence of severe pain with depression. There was no statistically significant (p>0.05) relationship between age, gender, marital status, employment status, family history of depression, duration of CLBP, with depression in our studied population. There was also no statistically significant (p>0.05) relationship between the presence of severe pain with ethnicity and with a duration of CLBP (Table 2).

Table 2 Relationship between factors and pain

Factors	Median pain score	Presence of severe pain (n)	p value
Ethnicity			
Malay	6	23	0.308
Chinese	5	8	
Indian	7	14	
Duration of CLBP			
< 1 year	4	8	0.474
≥ 1 year	6	37	

4. DISCUSSION

Malaysia is a multi-ethnic country with 58% of Malay, 27% of Chinese and 8% of Indian (Yeoh et al., 2017) with its remaining include the Aboriginal people of Malaysia such as the Muruts, Dayaks and Kadazan - Dusuns. Studies identifying the relationship of ethnicity and depression among Malaysians had varied findings and no study was performed specifically among CLBP Malaysians. A study found that the Chinese reported the lowest rate of depressive symptoms (Yeoh et al., 2017) while another found that Indians reported the lowest prevalence of depression (Kader Maideen et al., 2014). Seed et al. reported a high incidence of depression among Indian patients with chronic pain but couldn't find statistically significant in comparison with other ethnic groups which is unlike our study (Seed et al., 2015).

Our study found a statistically significant (p<0.05) relationship between ethnicity and depression among CLBP participants, where Malay participants had the lowest rate of depression (29.1%), (Figure 3). Malay culture has been linked to strong family and religious values (Lim et al., 2007). They are of the Islam faith (Federal Constitution, 2010), which emphasises the importance of family and community values (Sabry and Vohra, 2013). Through Islamic teaching, Muslims believe that any negative experience like illness is a form of test and they should have patience and trust the outcome in God (Sabry and Vohra, 2013; Toghyani et al., 2018). The various practices in Islamic lifestyle such as everyday prayers, acts of benevolence, fasting, and reciting of their holy Quran, could improve devotees' mental health (Toghyani et al., 2018). Hackney and Sanders (2003) reported positive effects between religiosity and mental health

In contrast, our study found that among CLBP participants, Indian ethnicity had the highest prevalence of depression (62.5%), like the findings by a report (Ministry of Health Malaysia, 2017). Lack of mental health literacy (Khan et al., 2010), lack of insight from professionals to the Indian community (Hanafiah et al., 2015) and socioeconomic marginalisation (Loo and Furnham, 2013; Rashid and Tahir, 2014) may be a contributing factor to these findings. Despite being a major ethnic group in Malaysia, a study reported that none of the mental health professionals mentioned the negative stereotypes and behaviour by the Indian ethnic towards mental illness (Hanafiah et al., 2015). Based on our findings and literature, we believe that among CLBP patients, clinicians should be aware of the potential depression especially among Indian ethnics and enlist mental health professionals to maximise treatment outcomes. It is worth noting that there is a belief in Malaysia that Indian ethnics have lower pain tolerance (Gupta et al., 2009) and that their reduced pain tolerance is a contributing factor to depression. Literature suggests a link between the severity of pain and ethnicity, although none of the literature was specific to CLBP patients (Vietri, 2015).

In our study, the previous history of depression is a significant risk of depression (p<0.05) (Table 1). There was an odds ratio (OR) of 2.87 which indicate that among individual with CLBP, the previous history of depression increases the odds. Our study echoed these findings (Kader Maideen et al., 2014), even though our target population slightly differ where our study was specific to participants with CLBP. There were many previous papers in the literature that showed depression was significantly affected by gender, age, educational level, marital and employment status (Ho et al., 2011; Munce et al., 2007). However, the relationship between family history of depression and depression was not statistically significant in our study (p>0.05) (Table 1), despite the

indication of an increasing trend with OR of 3.35. Therefore, in patients with a past history or family history of depression, the involvement of mental health professionals in their treatment may benefit recovery and improve their outcome.

Our study also showed a statistically significant relationship between having a formal education and depression. We found that the OR for formal education is 0.067 which suggests that formal education lower the odds of depression among CLBP participants. This finding is also reported in several other studies (Ten Kate et al., 2017; Bauldry, 2015). Since all participants in our study had CLBP, we examined the relationship between the severity of pain and depression, (Table 2) found to be statistically highly significant (p<0.001).

The link between pain and depression could be explained by the shared pathophysiology and neurotransmitters between pain and depression. Both pain-facilitating modulators and depression share the same pathophysiology pathway in the periaqueductal gray, amygdala, and hypothalamus regions. The amygdala plays an important role in emotional responses, stress, and anxiety and is believed to be a critical component of the pain matrix. This region may contribute significantly to the integration of pain and associated responses such as depression and anxiety (Ossipov et al., 2010). The mood, which involves the limbic system (amygdala), shares the same pathophysiological pathway as pain facilitating modulators (Sheng et al., 2017). Thus, it may be recommended to focus on the education of cognitive processes such as attention diversion techniques that would deconstruct the sensation of pain. Research has shown that pain-related cognitive processes and mindfulness are effective in pain intensity prediction (Namjoo et al., 2018). In other words, it can explain the role of mindfulness and adaptive cognitive processing in primary pain management. It is a known fact that depression frequently complicate the effective management of pain. Therefore, patient with CLBP associated with depression suffers a poor quality of life (Arnow et al., 2009). More research is necessary to see the effect of treating depression in the management of CLBP whether the relief of depressive symptoms improves pain.

Limitations
However, our study is unable to definitively establish whether depression had led to CLBP due to reduced pain tolerance with heightened pain sensitivity, or that depression is a reaction to the immobility due to CLBP. We did not investigate family support which is an important factor in alleviating depression (Stice et al., 2004.) Our small sample size may also contribute to providing an accurate result.

5. CONCLUSION
Depression is common among patients with CLBP and significantly associated with the severity of pain. Therefore, patients with CLBP may be considered for regular screening for depression during their clinic visits.

Informed consent
Written & Oral informed consent was obtained from all individual participants included in the study. Additional informed consent was obtained from all individual participants for whom identifying information is included in this manuscript.

Ethical approval
The study was approved by the International Medical University Joint Committee on Research and Ethics with reference number 4,13/JCM-144.

Data and materials availability
All data associated with this study are present in the paper and the Malaysia Research Ethic Committee, Ministry of Health, Malaysia approved the research project.

Author Contribution Details
MAI and PG involved in the conception, designing the study and wrote the manuscript. ARA, FAS, and AVS supervised the development of work, while JCWN, SR, SYN, and DKS collected the data. The data analysis was performed by SSH. All authors read and approved the final manuscript.

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Conflict of Interest Statement

We state that any financial and personal relationships with other people or organizations that could inappropriately influence our work are NONE. We don't have any conflict of interest.

Declaration

The authors declare that they are responsible for the article's content including study design, data collection, analysis and interpretation, writing, some of the main line, or all the preparation and review of the contents and approval of the final version of the article.

List of Abbreviation

CLBP: Chronic Low Back Pain
IMU: International Medical University

Peer-review

External peer-review was done through double-blind method.

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