Research Article
Open Access

Relations with low back pain in leg length discrepancies medical students in Jakarta (Indonesia): cross-sectional study

Abstract

Background: Low back pain is a major health problem that has a negative impact on quality of life and socioeconomic. The prevalence of LBP in young people increases with age and when entering working life may be one risk factor musculoskeletal disorder. Leg length inquality or Leg Length Discrepancy is a condition in which both lower legs of unequal length. The inequalities that occur limb length can cause dysfunction and pain, including low back pain.

Aim: Knowing the relationship of low back pain with leg length discrepancy at the Medical Faculty students Atma Jaya Catholic University of Indonesia.

Method: This study is an observational study using data capture cross-sectional and descriptive way analytic conclusions. How to leg length measurement using measurement tape with two measurement techniques that true and apparent measurement tape measurement tape.

Results: A study of 67 respondents there were 34 respondents with complaints of low back pain. The majority of the complaints LBP is the most female students. There was no relationship between the duration, frequency, intensity of pain and disability due to low back pain with leg length discrepancy. (P<0.05)

Conclusion: There was no relationship of low back pain with leg length discrepancy at the Medical Faculty students Atma Jaya Catholic University of Indonesia.

Keywords: low back pain, leg length discrepancy, leg length inequality, limb length discrepancy, limb length inequality, low back pain and leg length discrepancy

Volume 6 Issue 2 - 2019

Melani Kawilarang, Ignatio Rika, Nawanto Agung
Faculty of Medicine, University of Atma Jaya, Indonesia

Correspondence: Melani Kawilarang, Faculty of Medicine, University of Atma Jaya, Indonesia, Tel 082293003975, Email mmtwins_19@yahoo.com

Received: November 30, 2018 | **Published:** March 07, 2019

Preliminary

Low back pain (LBP) has long been recognized as a major health problem. The increasing prevalence of LBP has a negative impact on quality of life, and sosioekonomi.[1] Low back pain in Indonesia often found in the age group of 40 years. The prevalence of low back pain in young people increases with age. When entering the working life can be one risk factor muskulosceletal disorder.[2] Low back pain identified as pain that occurs in the lumbosacral spine and surrounding muscle layers accompanied with or without pain feet.[3]

Leg length inquality (LLI) or Leg Length Discrepancy (LLD) is a condition in which both lower limbs are not equal long.[4] A study reports that there are 70% of the normal adult population who show LLD minor,[5] and other studies show that 93% of school children have LLD.[6] LLD is more than 10mm can cause biomechanical disorders such as scoliosis, joint pain back and lower extremities, pelvic tilt, abnormal gait and degenerative joint disease that prematur.[7] Inequalities that occur limb length can cause dysfunction and pain, including low back pain.

Method

This study is an observational study (non experimental) by means of data capture cross - sectional and how conclusions descriptively and analytically. The independent variable is the leg length discrepancy and the dependent variable is low back pain. The study was conducted in January and July in the academic year 2017-2018 Faculty of Medicine, University of Atma Jaya.

The sampling technique used was quota sampling. The samples taken are an affordable whole population in accordance with the criteria for inclusion and exclusion criteria were applied in this study. The samples obtained were 67 respondents. Data analysis was conducted to determine whether there is a relationship between independent and dependent variables, using the chi-square test (P<α0.05).

How to determine which low back pain using a questionnaire consisting of the duration of low back pain, low back pain frequency, Numerical rating scales, and Roland-Morris disability questionnaire. While the difference in leg length measurement used a tape in two ways that is true measurement tape measurement tape measurement and apparent. The threshold values used LLD which is 10mm.

Measurement of low back pain consists of duration, frequency, intensity of pain and disability due to LBP. Duration classified into acute LBP (<3 weeks), Sub-acute (3 weeks–3 months) and chronic (>3 months).[8] The frequency of LBP classified as rare sometimes, often, very often, and every time. LBP assessed pain intensity numerical rating scales are classified into mild pain (≤5), moderate pain (6-7) and severe pain (≥8).[9] Score rolland moris result of disability questionnaire divided into two groups, namely functional state (≤4), and the dysfunctional state (>4).[10]

Results

Based on the research that has been done to the students of the Faculty of Medicine, University of Atma Jaya Indonesia with a total sample of 67 respondents, to determine whether there is a relationship

between low back pains with leg length discrepancy at the Medical Faculty students Atma Jaya University, obtained the following results.

Results of univariate analysis showed that the majority of respondents were women amounted to 40 out of 67 respondents. Average - total average age of the respondent's i.e 19.7 years. Based on height, male - male average- higher average than women. In the measurement of body weight gained weight male respondents - men harder than women (Table 1).

Table 1 Description average - average characteristics by gender of respondents

	Gender		
	Male -male (27)	Women (40)	Total
	Mean (SD)	Mean (SD)	Mean (SD)
Age	19.8 (0.9)	19.6 (1)	19.7 (1)
Height (cm)	170.3 (7.1)	156.1 (5.5)	161.8 (9.3)
Weight (kg)	73.4 (14.7)	55.4 (9.2)	62.6 (14.7)
Body mass index	25.3 (4.5)	22.7 (3.5)	23.8 (4.1)

Table 2 shows that by 67 respondents surveyed are 34 people with low back complaints. Women are the majority of the complaints of low back pain that is 22 respondents. Based on the test results of the bivariate analysis, it was found that there was no sex relations with complaints of low back pain (p=0.397). The number of respondents with a body mass index Overweight - Obese is 40 respondents. Based on the analysis of test results showed that there is no relationship of body mass index with complaints of low back pain (p=0.518).

Table 2 Relationship complaint low back pain based respondent characteristics

	Complaints low back pain		Total	P
	Yes	Not		
Gender				
Man	12	15	27	0.397
Woman	22	18	40	
Total	34	33	67	
BMI				
Underweight -Normal	15	12	27	0.518
Overweight - Obese	19	21	40	
Total	34	33	67	

BMI, body mass index

Based on Table 3 shows that there is no relationship between low back pain with leg length discrepancy (p=0.548; p=0.95). Table 4 shows that there was no correlation between the duration, frequency, intensity, and disability due to low back pain with leg length discrepancy (p<0.05).

Table 3 Relationship complaint low back pain with leg length discrepancy based measurement true and apparent leg length leg length

		LBP complaint		Total	P
		Yes	Not		
True leg length	Normal	23	20	43	0.548
	LLD	11	13	24	
Apparent leg length	Normal	27	26	53	0.95
	LLD	7	7	14	
Total		34	33	67	

Table 4 Relationship complaint low back pain based respondent characteristics

		TLL		Total	P	ALL		Total	P
		Normal	LLD			Normal	LLD		
Length low back pain	Acute	20	10	30	0.17	23	7	30	0.556
	Sub-acute	0	1	1		1	0	1	
	Chronic	3	0	3		3	0	3	
Frequency low back pain	Never	4	2	6	0.336	3	3	6	0.382
	Rarely	14	4	18		15	3	18	
	Sometimes	4	4	8		7	1	8	
	Often	1	0	1		1	0	1	
	Very often	0	1	1		1	0	1	
	All the time	0	0	0		0	0	0	
Pain intensity low back pain	Mild pain	21	10	31	0.97	24	7	31	0.356
	Moderate pain	2	1	3		3	0	3	
	pain weight	0	0	0		0	0	0	
Roland Morris disability questionnaire score	Functional state	15	7	22	0.928	17	5	22	0.676
	Dysfunctional state	8	4	12		10	2	12	

Discussion

Based on these results, the distribution of the average - average body mass index between students and the student together with the results of the IMT student Vucjic greater than student.[11] Based on research results Agrawal et al.[12] conducted on medical students in India shows that the male students - men tend to have excess weight of women.

Based on this study of 67 respondents obtained 34 people with complaints of low back pain on a student at the Faculty of Medicine, University of Atma Jaya Indonesia. Complaints most low back pain experienced by female students (22 respondents). These results together with the results of research conducted Vujcic on medical students Belgrade (Serbia). In research Vujcic complaints of low back pain that women experience significant aktvitasnya as a student and is due to mental stress during exams, sat during the lecture, fatigue, wrong posture and lack sports.[11]

In this study found no gender relations with complaints of low back pain (p=0.397). Research conducted Haroon et al.[13] against the medical students in Pakistan get results that there is no gender relationship with musculoskeletal pain including low back pain (p=0.316). Based on the analysis of the research, also found no relationship between BMI with complaints of low back pain. These results are similar to studies conducted Noormohammadpour et al.[14] & Y Du et al.[15]

In this study showed that there was no correlation between pain intensity LBP with LLD in true measurement of leg length and apparent leg length measurement. In Rannisto et al.[16] study shows that there is a relationship between pain intensity of low back pain with leg length discrepancy in the group of respondents butcher. The big difference in work or activities of the respondents in the study Rannisto affect the results that is.[16]

The results of the study by Noormohammadpour et al.[14] Have the same results as the results of this study, namely that there is no relationship between LBP and LLD. His research was conducted on a smaller number of respondents than this study, which was 28 respondents. Respondents from the Noormohammadpour study were male football players with a age range of 12-15 years. The results of this study are also the same as the research by Goss et al.[17] Although with a larger number of respondents, 1100 respondents, it was found that there was no relationship between LBP with LLD. The Goss et al.[17] Study used a tape measure as a tool for measuring foot length, a 5mm threshold value in determining LLD, and used a medical record as a method of determining LBP in its respondents.[17] Nichols and Bailey with their research setting 12.5mm as a significant LLD cut-off point.[18] In the study conducted, 10mm was determined as the cut off point of the leg length difference that was meaningful for LLD.

Research by Rannisto showed that there is a relationship between LBP with LLD. Research conducted to 114 respondents with a meat cutter jobs (standing at work) and 34 customer service workers who have worked for 10 years. In their study based on the work of respondents found that the work load on the lower extremities may be a contributing factor LBP.[16] The results are related to the research conducted Sheha[19] the long standing colleagues in people with LLD cause degenerative changes in the lumbar spine, gait disturbance mechanically and low back pain.

Accurate measurement is the factor that affects the outcome of research on the relationship LBP and LLD. Based on research Sharpe, said that the radiographic measurements with sensitive and accurate with a precision of 1mm, but is expensive, time-consuming and often not tersedia.[18] Jamaluddin[20] Research regarding the reliability and accuracy of the tape measurement methods with accuracy of 5mm obtained TMM reliable and accurate use in the measurement of results of research Jamaluddin[20] LLD is supported by Neely et al.[21] who found that TMM was valid and reliable based research to 30 adults by 2 physical therapist by comparing TMM and CT- Scan in leg length measurement. [21] Based on research Sabharwal bahwat[22] tape obtained measurement has lower accuracy compared with measurement using ultrasound. So that the measurement tape tends to be used as a screening tool and not a modality for men diagnosis. Research by Havian et al.[23] define algorithms for older adult with LLD using the TLL or ALL TMM as a screening tool and set the value of 1.25cm as the cut off pointnya.[23]

The difference results in research on the presence or absence of a relationship LBP with LLD is influenced by several factors such as: the number of respondents, respondent characteristics (occupation, type of activity, etc.), the type of measurement method LLD, the determination of the threshold value of LLD pathological and types of methods for determining the presence or absence LBP.

Limitations of this study that is due to the number of small sample, sampling techniques that make use of quota sampling, and measurement methods are limited i.e, with measurement tape. Tape method of measurement is often used as a screening for leg length discrepancy with the advantages of a cheaper and easier to do. Some studies suggest accurate measurement tape is used in the measurement of leg length. Additional research is generally done only true measurement tape measurement. While the study was conducted two measurements of the true leg length and apparent leg length to leg length measurement, thereby reducing researcher bias.

Conclusion

Based on research conducted with 67 students, 34 students got to experience low back pain. There was no relationship between the duration, frequency, intensity, and disability due to low back pain with leg length discrepancy. From the results of this study concluded that there is no relationship between low back pain with leg length discrepancy

Thank-you note

Praise to God Almighty, for his blessings I can finish a study entitled "The relationship between low back pain with leg length discrepancy at the Faculty of Medicine, University of Atma Jaya Indonesia". The authors also thank Dr. Ignatio Rica, Sp. OK as a mentor, Dr. Nawanto Court, Sp.OK, and Dr. Tena Djuartina, M.Biomed guide writers who participated in the study, all respondents who have been willing to participate in research, as well as family and friends - friends who have given prayers and support so that this study went smoothly.

Conflicts of interest

The authors declare there are no conflicts of interest.

References

1. Xia Q, Long CR, Vining RD, et al. Association of lumbar spine stiffness and flexion-relaxation phenomenon with patient-reported outcomes in adults with chronic low back pain - a single-arm clinical trial investigating the effects of thrust spinal manipulation. *BMC Complement Altern Med.* 2017;17(1):303.

2. Lunde L, Koch M, Hanvold TN, et al. Low back pain and physical activity - A 6.5 year follow-up among young adults in their transition from school to working life. *BMC Public Health*. 2015;15:1115.

3. Hurwitz EL, Morgenstern H, Yu F. Cross-sectional and longitudinal associations of low-back pain and related disability with psychological distress among patients enrolled in the UCLA study low-back pain. *J Clin Epidemiol*. 2003;56(5):463–471.

4. Gurney B. Leg length discrepancy. *Gait Posture*. 2002;15(2):195–206.

5. Subotnick SI. Limb length discrepancies of the lower extremity (the short leg syndrome). *J Orthop Sports Phys Ther*. 1981;3(1):11–16.

6. Woerman AL, Binder-Macleod SA. Leg length discrepancy assessment: accuracy and precision in five clinical methods of evaluation. *J Orthop Sports Phys Ther*. 1984;5(5):230–239.

7. Shailam R, Jaramillo D, Kan JH. Growth arrest and leg-length discrepancy. *Pediatr Radiol*. 2013;43 Suppl 1:S155–S165.

8. Koes BW, van Tulder M, Lin CW, et al. An updated overview of clinical guidelines for the management of non-specific low back pain in primary care. *Eur Spine J*. 2010;19(12):2075–2094.

9. Boonstra AM, Stewart RE, Koke AJ, et al. Cut-off points for mild, moderate, and severe pain on the numeric rating scale for pain in patients with chronic musculoskeletal pain: variability and influence of sex and catastrophizing. *Front Psychol*. 2016;7:1466.

10. Stratford PW, Riddle DL. A Roland Morris disability questionnaire target value to distinguish between functional and dysfunctional states in people with low back pain. *Physiother Can*. 2016;68(1):29–35.

11. Vujcic I, Stojilovic N, Dubljanin E, et al. Low back pain among medical students in Belgrade (Serbia): A cross-sectional study. *Pain Res Manag*. 2018;2018:8317906.

12. Agrawal S, Sinha V, Kachhawa P, et al. Study of body mass index in first year MBBS students in a medical college of Eastern UP. *International Journal of Medical Science and Public Health*. 2017;6(2):262–265.

13. Haroon H, Mehmood S, Imtiaz M, et al. Musculoskeletal pain and its associated risk factors among medical students of a public sector University in Karachi, Pakistan. *J Pak Med Assoc*. 2018;68(4):682–688.

14. Noormohammadpour P, Hosseini Khezri A, Linek P, et al. Comparison of lateral abdominal muscle thickness and cross sectional area of multifidus in adolescent soccer players with and without low back pain: a case control study. *Asian J Sports Med*. 2016;7(4):e38318.

15. Jerry YD, Alexander A, Joshua ES, et al. Neck pain and low back pain in medical students: A cross-sectional study. *Arch Int Med Public Health Community*. 2017;1(1):1–9.

16. Rannisto S, Okuloff A, Uitti J, et al. Leg-length discrepancy is associated with low back pain among those who must stand while working. *BMC Musculoskel Disord*. 2015;16:110–117.

17. Goss DL, Moore JH, Slivka EM, et al. Comparison of cadets with injury rates between limb length inequalities and matched control subjects over 1 year of military training and athletic participation. *Mil Med Oxf*. 2006;171(6):522–525.

18. Sharpe CR. Leg length inequality. *Can Fam Physician*. 1983;29:332–336.

19. Sheha ED, Steinhaus ME, Kim HJ, et al. Leg-length discrepancy, functional scoliosis, and low back pain. *JBJS Rev*. 2018;6(8):e6.

20. Jamaluddin S, Solomon AR, Imran MK, et al. Reliability and accuracy of the tape measurement method with a nearest reading of 5 mm in the assessment of leg length discrepancy. *Singapore Med J*. 2011;52(9):681–684.

21. Neelly K, Wallmann HW, Backus CJ. Validity of measuring leg length with a tape measure compared to a computed tomography scan. *Physiother Theory Pract*. 2013;29(6):487–492.

22. Sabharwal S, Rozbruch SR. What's new in limb lengthening and deformity correction. *J Bone Joint Surg Am*. 2011;93(24):2323–2332.

23. Havran M, Scholten JD, Breuer P, et al. Deconstructing chronic low back pain in the older adult-step-by-step evidence and expert-based Recommendations for evaluation and treatment: Part XII: Leg Length Discrepancy. *Pain Med*. 2016;17(12):2230–2237.

Citation: Kawilarang M, Rika I Agung N. Relations with low back pain in leg length discrepancies medical students in Jakarta (Indonesia): cross-sectional study. *MOJ Anat & Physiol.* 2019;6(2):35–38. DOI: 10.15406/mojap.2019.06.00241