International Journal of Physical Education and Sports Sciences
Vol. 13, Issue No. 03, June-2018, ISSN 2231-3745

Lordosis, Regions and School Children: A Study Seeking the Association of Region and Gender with the Status of Lordosis in Madhya Pradesh

Dr. Preeti Sharma[1]* Dr. Rajender Singh[2]

[1] Post-Doctoral Research Scholar, SOSPESS, Jiwaji University

[2] Director Physical Education, SOSPESS, Jiwaji University

Abstract – The primary purpose of the study was to find out whether the degree of lordosis is equal in all the selected regions of Madhya Pradesh irrespective of the different gender. Purpose of the research was to study the association of gender and region with the status of lordosis. A total of 500 school children in the age range of 10-15 were selected from the four districts (Bhind, Bhopal, Morar and Shivpuri) of Madhya Pradesh. Lordosis was measured by measuring the angles of thoracic curve with the help of a flexicurve ruler. Anyone who was having 45 or more than 45 degree was kept into the category of lordotic. The data was analyzed by employing descriptive statistics, chi square. The level of significance was set at .05.

Results of the study revealed that 43 percent of school children in different regions of Madhya Pradesh were suffering from lordosis. The results revealed that Shivpuri region has the highest percentage of lordosis followed by Morar (43.2), Bhopal (38.4) and Bhind (38.4).

The data was further analyzed by employing Chi Square analyses and results showed a significant association between gender and the status of lordosis among the school children of Madhya Pradesh as the calculated chi square (X^2) = 5.029 is higher than the tabulated value of chi square ($X^2$0.05 (1) = 3.84). Results also revealed a very marginal association between the status of lordosis and different regions of Madhya Pradesh, as the calculated chi square (X^2) = 7.84 is higher than the tabulated value of chi square ($X^2$0.05 (3) = 7.82).

Based on the results it can be concluded and suggested that there is a high need of awareness program in various parts of Madhya Pradesh regarding lordosis and its remedial measures.

Keywords: Lordosis, Spinal Deformity, School children, Two way factorial Anova, Madhya Pradesh

----------♦----------

INTRODUCTION

The spine has got three natural curves namely cervical, thoracic and lumbar depending on the region of curve. There are different kinds of spinal deformities prevalent among the school children. Lordosis is one of the most prevalent deformities. Lordosis can be defined by an excessive inward curvature in the lumbar region of spine. Although it primary affects the lumbar spine, it does occur in the neck too. Patients with excessive lumbar lordosis may appear swayback, the buttocks more prominent, and in general their posture appears exaggerated. Lordosis affects people of all ages but children are more vulnerable to this problem. It affects the lower back, it can cause back pain making movement difficult and painful.

Lumbar lordosis has long been studied, and its curvature is associated with various factors, such as thoracic curvature, age, gender, pelvic bend, among others. Studies have been conducted intending to measure lumbar and spinal segments curvatures. Spondylolisthesis, osteoporosis, and even obesity may lead to abnormal lordosis.[1] Another common cause of excess lordosis in the low back is excessive sitting, which shortens the muscles in the front of the hips, pulling them forward and creating more curve in

[1] Retrieved on March 27, from https://www.spineuniverse.com/anatomy/normal-curves-your-spine

the lower back. Anything that pulls the hips forward, including excess abdominal weight, can cause swayback.

The children who sit a lot or carrying heavy backpacks followed by wrong lifestyle, poor posture, and weak spine can easily be affected by lordosis. By keeping its vulnerability among children the present study was constituted with the following purpose.

PURPOSE OF THE STUDY

- To find out the prevalence of lordosis in Madhya Pradesh
- To study the association of gender with the status of lordosis prevalent among the school children of Madhya Pradesh.
- To study the association of different regions of Madhya Pradesh with the status of lordosis.

METHODOLOGY

Sample: the data was collected from four different districts of Madhya Pradesh. The total sample size was 500 school children (125 from each district) studying from different kinds of schools. All the children were ranging into the age group of 10-15 years.

Criterion measures. Lordosis was measured by measuring the degree of lumbar curvature of the spine. Anyone who had equal to or more than 45 degree of curvature was kept into the category of lordotic category.

Measurement of Lordosis

Research Instruments: A flexible ruler (flexicurve) was used to measure the degree of kyphosis.

Administration of Test: Each student was asked to come one by one in private ward (with the permission of principal of the concerned school) in the presence of physical education teacher, and remove their shirts off so that the spinous processes of L_1 and L5 can be marked with a skin marker. The child was asked to inhale and exhale without forcing out the breath. The flexicurve was carefully conformed to the lumbar spine. The span of the spinal curve was noted down on the graph paper by using the flexicurve ruler.

Converting Raw Scores into Degrees: The lordotic angle was calculated with the trigonometric calculation using the following formula:

Lordotic Angle = 4 X [arc tan (2H/L)]

Where,
H is the height of the curve (perpendicular to length).
L is the length of the curve.

Statistical test employed: The data was analyzed by descriptive analysis, chi square test and two way factorial Anova. The level of significance was set at .05

RESULTS AND FINDINGS

Table 1 shows the mean and standard deviation of degree of lordosis irrespective of the gender and being into the category of lordotic. Table also gives the percentage of lordosis prevalent among the school children of different selected regions/districts of Madhya Pradesh.

Table 1: Prevalence of kyphosis among the school children of Madhya Pradesh

	Descriptive Statistics				
	Dependent Variable: degree of kyphosis				
kyphotic/non kyphotic	Zonal Region	N	Percent	Mean	Std. Deviation
NON LORDOTIC	BHIND	77	61.6	35.31	6.11
	BHOPAL	77	61.6	35.49	6.35
	MORAR	71	56.8	35.25	6.76
	SHIVPURI	58	46.4	35.77	6.19
	TOTAL	283	56.6	35.44	6.33
LORDOTIC	BHIND	48	38.4	54.68	7.09
	BHOPAL	48	38.4	54.70	7.34
	MORAR	54	43.2	56.18	7.80
	SHIVPURI	67	53.6	56.61	10.84
	TOTAL	217	43.4	55.65	8.62
TOTAL	BHIND	125	25	42.75	11.46
	BHOPAL	125	25	42.87	11.54
	MORAR	125	25	44.30	12.65
	SHIVPURI	125	25	46.94	13.75
	TOTAL	500	100	44.21	12.46

It is clearly visible from the above table that approx. 43 percent of school children in Madhya Pradesh are suffering from lordosis deformity. The table further reveals that Shivpuri region has the highest percentage (53.6) of lordosis followed by Morar, Bhopal and Bhind. Below given figure presents the graphical explanations of the above table.

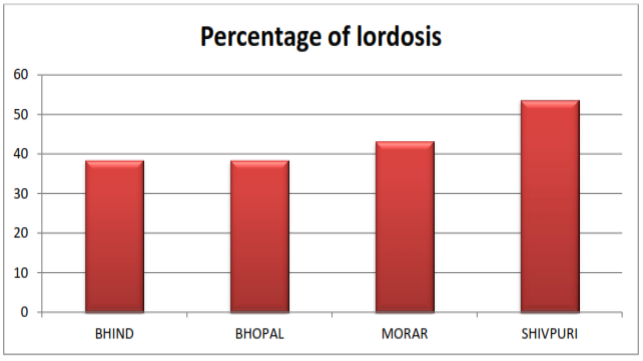

Fig1: Percentage of Lordosis Prevalent among the school children of different regions of Madhya Pradesh.

Table2: Chi Square for the data on incidences of lordosis in order to find out its Association with Gender

			Gender		Total	χ^2
			Male	Female		
Status of deformity	lordotic	Observed	84	133	217	5.029
		Expected	96.3	120.7	217.0	
	Non-ordotic	Observed	138	145	283	
		Expected	125.7	157.3	283.0	
	Total	Observed	222	278	500	
		Expected	222.0	278.0	500.0	

$\chi^2_{0.05}(1) = 3.841$, significant at 5% Level

The above table is showing the testing of null hypothesis (H_o) i.e. there is no association between gender and the status of lordosis among the school children of Madhya Pradesh against the research hypothesis that there is a significant association between gender and the status of lordosis among the school children of Madhya Pradesh. Results revealed a significant association, as the calculated chi square (χ^2) = 5.029 is higher than the tabulated value of chi square ($\chi^2_{0.05}$ (1) = 3.84). Thereby, it can be concluded that there is a significant association of gender with the prevalence of lordosis in different regions of Madhya Pradesh.

Table 3: Chi Square for the data on incidences of lordosis in order to find out its Association with Region

			Region				Total	χ^2
			bhind	bhopal	morar	shivpuri		
Status of deformity	lordotic	Observed	48	48	54	67	217	7.84 *
		Expected	54.3	54.3	54.3	54.3	217.0	
	Non lordotic	Observed	77	77	71	58	283	
		Expected	70.8	70.8	70.8	70.8	283.0	
	Total	Observed	125	125	125	125	500	
		Expected	125.0	125.0	125.0	125.0	500.0	

$\chi^2_{0.05}(3) = 7.82$, *Significant at 5% Level

The above table is showing the testing of null hypothesis (H_o) i.e. there is no association between region and the status of lordosis among the school children of Madhya Pradesh against the research hypothesis that there is a significant association between region and the status of lordosis among the school children of Madhya Pradesh. Results revealed a very marginal association, as the calculated chi square (χ^2) = 7.84 is higher than the tabulated value of chi square ($\chi^2_{0.05}$ (3) = 7.82). Hence, it can be said that there is marginally a significant association between the status of lordosis and different regions of Madhya Pradesh.

DISCUSSION OF FINDINGS OF CONCLUSION

The data was analyzed in order to the prevalence of lordosis among the children of Madhya Pradesh. results of the study revealed approx. 43 percent of school children in Madhya Pradesh are suffering from lordosis deformity. The table further reveals that Shivpuri region has the highest percentage of lordosis followed by Morar, Bhopal and Bhind. The data was again scanned it was found that there is a significant association between the status of lordosis and different genders. It was also reported that there is a very marginal association between the status of lordosis and different regions and hence it can lordosis is prevalent in all the regions more or less equally. The results of the presents study goes along with the findings of the other research scholar who conducted studies regarding the prevalence of lordosis in different parts of the world. Based on the above findings it can be concluded that lordosis is quite a popular spinal deformity among the children, it's only the percentage varies from regions to region and one gender to another. It can further be concluded and suggested that there is a need of awareness program and remedial measures regarding lordosis in different regions of Madhya Pradesh.

REFERENCES

Been E, Kalichman L. Lumbar lordosis. Spine J. 2014; 14(1): pp. 87–97. doi: 10.1016/j.spinee.2013.07.464 [PubMed]

Gelb D.E., Lenke L.G., Bridwell K.H., Blanke K., McEnery K.W. (1995). An analysis of sagittal spinal alignment in 100 asymptomatic middle and older aged vonluteers. Spine. 20: pp. 1351-8.

Stagnara P., De Mauroy J.C., Dran G., Gonon G.P., Costanzo G., Dimnet J. et. al. (1982). Reciprocal angulation of vertebral bodies in a sagittal plane: approach to references for the evaluation of kyphosis and lordosis. Spine. 7: pp. 335-42.

Panjabi M.M. (1974). White III AA, Brand Jr RA. A note on defining body parts configurations. J Biomech. 1974; 7: pp. 385-7.

Tüzün C., Yorulmaz I., Cindas A., Vatan S. (1999). Low back pain and posture. Clin Rheum. 18: pp. 308-12.

Wambolt A., Spencer D.L. (1987). Analyses of the distribution of the lumbar lordosis in the normal Spine. Orthop Trans. 1987; 11: pp. 92-3.

Corresponding Author

Dr. Preeti Sharma*

Post-Doctoral Research Scholar, SOSPESS, Jiwaji University

khunti_03@hotmail.com