

# The Sitting Posture of the Low Rider Users Produces Mechanical Pain

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## Abstracts

The low rider is one of the most effective ground level devices for disabled people who are unable to walk and whose functional activities are ground levels. The aim of this study is to provide that low rider users, who are in a sitting position for a long period of time, have mechanical pain to the thoracic or lumbar region. Eight females and two males participated. Of those, seven were from a rural area; two were from an urban area and one from a semi urban area. This is a qualitative type of study. For data collection a convenience sample was used. Also, a questionnaire, in a face-to-face interview, nine or 90% of participants said they had pain during activities. Only one or 10% of the participants said they have no pain when they use the low rider. The main reason for the pain was that the low rider sat in a forward position, which caused the problem. Then the fact that they had to propel themselves caused more pressure to the lower back, thus causing pain. To prevent the problem of back pain, the researcher has recommended that another study is carried out regarding the modification in the design of the low rider, so as to improve the postural problem.

## Introduction

The low rider probably first originated in south India. "The Centre for the Rehabilitation of the Paralyzed (CRP) quite early on their development identified a need for a low level mobility device for spinal cord injury patients for the rural parts of Bangladesh. In 1979 photographs were taken of a device used in India and used as the basis for the original CRP design. Prior to this no mobility device was being made in CRP. CRP is a non-government organization in Bangladesh

(Cook K. 2000). "In 1997 a project run by the International Centre for the Advancement of Community Based Rehabilitation (ICACBR) Canada and the National Institute of Design India (NID), was initiated to design and manufacture a mobility device for people with disabilities, who have difficulty walking indoors and outdoors and were usually at floor level" (Cook K. 2000).

Mostly in the rural areas of Bangladesh, there are poor disabled women using the low rider because their maximum activity is floor level. For example cooking, cleaning the room, sweeping the yard or room, feeding the poultry, planting seeds, washing clothes, working a hand machine and other activities of daily living (ADL). "ADL tasks include the mobility, self care, communication, management of environment hard were and sexual expression."(Foti.D, 1981).

In Bangladesh's rural area, where there are many village interactions the day to day tasks are undertaken while sitting or squatting on the floor. "More activity takes place at floor level especially in a rural setting, so if a person sits at floor level they are not automatically seen as inferior. How they are perceived depends more on whether they are in an environment where every one else is sitting and working at floor level and whether they are engaged in any form of income generation" (Cook, K. 1994). Work place- if some people's work place has too low a surface, then day by day that person will get a kyphotic posture. A kyphotic posture is a poor posture. The main postural fault of a kyphotic sitting posture is a "postural depression" (Anderson, 1951). Postural depression refers to the approximation of thoracic spine to the pelvis. The common misconception is that the lumbar spinal flexion is the cause of "postural depression" when sitting. Instead this approximation of the thoracic spine to the pelvis (when sitting) is primarily is due to flexion of the lower thoracic spine and thoracic-lumbar junction. (Zacharkow, 1988). Latham (1957) referred to the lower thoracic spine as the "hinge area" for spinal flexion. According to McKenzie (1981), "a good sitting posture maintains the spinal curves normally present in the erect standing position". But maximum low rider users like to sit down in a "postural depression" position, which are a posterior rotation of the pelvis and a flattening of the lumbar lordosis. (Akerblom, 1948; Anderson et al, 1979). The lumbar lordosis will be lessened in all sitting postures compared to standing, regardless of the degree of the hip flexion mobility present (Bridger et al, 1989). In a sitting position 'A direct forward pressure on the lumbar spine has exactly the opposite mechanical effect on the lumbo-sacral joint. It flexes it by pushing the spine forward (Gorman, J; 1997).

Low rider users sitting in a long sitting position, cross sitting, knee-bent sitting position. When they sit down this way, the posterior pelvic tilts away. Otherwise they do not feel comfortable in that position. Sometimes they like to take a rest on the backrest, when they take a rest this way, their pelvic is posterior tilted. Only a small number of disable people are able to sit down with an anterior pelvic tilt as they lean on the back rest support which indicates that it reduces the mechanical advantages of the spinal region. When they remain in this position for a long period of time, then it's possible to cause a mechanical problem in that spinal region. Only a small number of disable people are to sit down with an anterior pelvic tilt when they rest on the back support of the low riders.

"Pain has a mechanical origin and occurs when the joint between two bones have been placed in a position that over-stretches the surrounding soft tissues. This is true for mechanical pain in any joint of the body, including the

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spine."(Mckenzie. RA; 1981)."Mechanical back pain is a catch of all diagnosis for patients with low back pain where a specific pathological process has not been identified with any degree of certainty."(McRae. R, et al; 1997)"Nevertheless, only about, 15% of the low back pain (LBP) sufferers can be given a diagnosis other than mechanical pain" (Dayo, 1991).

## Method

It is a qualitative type of study using a structured questionnaire. There are a small number of disabled people in Bangladesh who are using the low rider. So, they are interviewed, data is collected, and the convenience sample is used. Then a pain chart is used. For selection criteria there is another questionnaire by the researcher. There are at least four questions. If all of the answers are 'yes' then the patient is selected for this study. A blank copy of the selection criteria questionnaires is shown underneath.

**Selection criteria questions:** Are you unable to walk? Do you use the low rider? Are you using your low rider more than two years? Are you doing your maximum activities on the low rider?

## Participants

Ten low rider users were selected. Eight were female and 2 were male. By using this method it was possible to collect only ten participants, so people of different ages were used. When data was collected the age group was between 25-43 years. Out of ten data two were collected from urban areas, one was collected from semi rural area and seven were collected from rural areas of Bangladesh. Underneath is a table, which is easy to understand, about the patients' present situation.

The centre for the rehabilitation of the Paralysed (CRP) has done several mobile clinics and all the ex-patients have been visited. During mobile clinics some of the low rider users came with several complications, e.g. - pain, pressure sores, bowel and bladder incontinence and several deformity types of problems. This is the researcher experience. From that experience it was perceived that their maximum complications arose from their bad posture while propelling the low rider and also daily living activities. When the CRP did the home visits, they discovered these same problems. From that experience and observation it was possible to form a questionnaire. The people themselves answered these questions. Using a structured questionnaire in a face-to-face interview collected data. All of the low rider users were uneducated. Researcher has taken face-to-face interviews. The researcher asked the questions to the people being interviewed. During the interview those present were area leader, religious people, community rehabilitation technicians, social workers. During the data collection a hand tape recorder was used for correct information. For the interview, some of the questions were in details and some required short answers. A Yakisha camera was used, taking photographs in different positions (e.g.- working, resting and propelling) and the question was asked about their best position. For data collection a pain chart was used to measure the pain, using a 'semantic differential scale'. " 'Semantic differential scale' is

two rate individual statement on a number of different dimensions". (Fox. N. et al, 1996).

First the researcher met with the people and their relatives to give them information about him. Then the researcher explained about the aim of his study. Questionnaire, use of the hand tape-recorder and camera. Also the researcher explained there would be for a few interviews. When they agreed the researcher took all of the information by him. He switched on the hand tape-recorder to record the whole interview asking the questions and getting their replies. During the interview all of the answers were written down. Questions were limited. Also the researcher used the same questions for all of the participants. When the interviews were finished the researcher took two or three photographs of each participants, taking them from different positions, asking them which was the best position for them, both when propelling and working. The researcher has takes 45 minutes to one hour for one interview.

## Results

In data collection there was a similarity in the propelling the low rider and the sitting position, daily how long being using the low rider? Pain and range of pain intensity. Underneath thee is a table for clear understanding in this relation.

## Discussion

In a Bangladesh village setting, most of the women's daily activity would normally be carried out at floor level. Eg: - cooking, cleaning, eating, poultry, eating poultry, handicraft, transport themselves over short distance using their hands. In this study nine or 90% of the low rider users are self-propelled and they have pain in their back region after prolonged sitting positions in the low rider. They have all used the low rider from 2.5 years to 24 years daily from 7 hours to 17 hours (prolonged sitting). As Wyke has said," once a person has been sitting prolonged period of time the lumbar spine assumes the full flexion position". Relaxed sitting for any length of time places the lumbar spine in a full stretched position. Waddell, G (1998) said," When people like to sit in a relaxed position than maximum body weight through on the L3 region is greater than the standing position". Armstrong said in his study when people lean forward in a bending position then automatically the anterior annulus palposus gets more pressure and is encouraged to move the posteriorly. The anterior interosious ligaments loosen and the posterior interosious ligament stretch. If people use this position for a long period of time then may have chance of degenerative changes in the anterior part of the vertebral segment (Thoracic or Lumbar region). This will become painful, if maintained for a prolonged period. In this study all of the participants who have back pain sit down on the low rider for a long period of time in a forward bending position. They also propelled their low rider independently in a forward sitting position. Anderson, et al, "have demonstrated how in sitting the intradiscal pressure increases as the spine moves in to kyphosis and decreases as a it moves into lordosis". Those low rider users said that during sitting their pain increases with movements towards lordosis. In these instances there is

a correlation between intradiscal pressures with the pain pattern, which may well incriminate the intervertebral disc as being responsible for the production of the low back pain. When any part of the body is participated to prolong for a long period of time, then there is an increased chance of mechanical changes in that region. Therefore there is a clear reason for the production of mechanical pain in the low rider users. On the other hand their carer propels only one participant or 10% of the low rider users and they have no back pain while in a sitting position on the low rider. They like to sit down on the low rider in a straight sitting position with hands supported on both sides of the support of the low rider. In a normal curvature of the sitting posture is lumbar lordosis, thoracic kyphosis and cervical lordosis. During functional activity and moving forward they can maintained their sitting posture in a straight sitting position. So, they do not experience any extra pressure on their thoracic or lumbar region. Therefore there is little chance of detrimental mechanical changes arising from excessive pressure on their back.

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