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## Prevalence of scoliosis in excessive weight bearing female market workers more than 50 years old and working more than 5 years in Pasar Kumbasari, Denpasar, Bali

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### ABSTRACT

**Background:** Market workers tend to work a lot in order to feed their family. A lot of human labour work is done at the expense of their health status in order to make a living.

**Aim:** This study was conducted to determine the prevalence of scoliosis in female market workers in Pasar Kumbasari, Denpasar, Bali and the load lifting technique used to carry the loads in the market.

**Methods:** This is a cross sectional descriptive study done with non-probability consecutive sampling. Questionnaires were distributed to aid in obtaining information regarding the study.

**Results:** Of the total 115 female market workers interviewed, 7

of them had scoliosis. The scoliosis was apparent with abnormal gait associated with scoliosis and confirmation with the graphical aid used together with the questionnaires. As for the load lifting method used was carrying the loads over their heads. Many of the workers complained of pain in their neck and shoulders, arm and leg joints and lower back pain. The workers are found to be working in excess of 8 to 9 hours every day with rest in between periods when there are no people coming to buy things in the market.

**Conclusion:** It can be concluded that the prevalence of scoliosis in female market workers in Pasar Kumbasari is 0.061. The load lifting technique commonly used is carrying the loads over their heads.

**Keyword:** scoliosis, female market workers, load lifting techniques, spinal deformity

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### INTRODUCTION

In our daily lives, we encounter many problems that require the use of our body to achieve the goals. For example, carrying objects from one place to another. It is true that machines are invented for purposes of relieving the humans from exerting excessive force and thus making life easier. On the other hand, when it comes to aspects like business, economic and efficient use of resources is the key to gaining maximum profit. With that in mind, many people disregard the usage of heavy machinery such as forklifts, which not only can carry heavy objects but can carry objects in bulk, thus saving a lot of time in transportation of goods from one point to another in a specific geographical location.<sup>1</sup>

In Bali, Indonesia for instance, people who work in small factories and markets often have many objects to bring about here and there.<sup>2</sup> Of course in a big factory like manufacturing automobiles, the use of forklifts is common and it is a must to use such equipment and machinery to complete tasks in a given period in order to meet the demands of companies.<sup>3-5</sup> In addition, it is also a safety feature with the proper training and usage, to use heavy machinery in big factories. In contrast, people working small factories and markets do not use

machinery as it is costly and requires long periods of training and usage.<sup>6</sup>

From several studies that have been conducted worldwide, it was found that excessive weight bearing poses many problems. People are hospitalised or unable to work due to pains and deformity as a result of chronic excessive weight bearing. In Indonesia, there is no data to indicate if excessive weight bearing is linked to scoliosis. The age category of more than 50 years old is chosen because symptoms usually manifest when the person is aged. The manifestation is a result of years of excessive weight bearing.

### RESEARCH DESIGN AND METHODS

The study design that is chosen for this particular topic is cross sectional descriptive study design. The sampling method used for this study is non probability consecutive sampling. The survey would be conducted at 7<sup>th</sup> semester on a given duration. The period of this survey would be for two months. The survey will be conducted in pasar Kumbasari located in Denpasar, Bali. The sample is all weight bearing female market workers aged 50 years and older in pasar Kumbasari amounting to 115 people, without any congenital diseases, walking

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with an abnormal gait, without other diseases such as diabetes mellitus and are willing to take part in the survey. In this study, the independent variable is excessive weight variable and the dependent one is scoliosis, a deformed body posture which results due to the weakened integrity of the spine. The prevalence of market workers suffering from scoliosis is calculated based on the following formula: (Number of cases of a disease) / (Total population at risk for a limited period of time).

## RESULT

The results of this study are shown in the table below. From this study, it was found that the prevalence of scoliosis in women is 0.061. As for the lifting technique used by the market workers is carrying the weights on their heads.

**Table 1. Number of market workers who took part and did not take part in the survey**

Criteria	Results
Number of women who participated in the research	115
Number of women who did not participate in the research	10

**Table 2. Data related to the average working duration of the workers**

Average working duration	Number of workers
7 to 9 hours	100
5 to 7 hours	5
Less than 5 hours	10

**Table 3. Average weight carried by the market workers**

Average weight	Number of workers
Between 50-60 kg	5
Between 40-50 kg	40
Between 30-40 kg	57
Between 20-30 kg	7
Less than 20 kg	7

**Table 4. Most common symptoms complained by the workers**

Symptoms	Number of workers
Pain in the neck and shoulders	115
Low back pain	115
Shoulder joints pain	115
Knee joints pain	100

**Table 5. Data of presence and absence of scoliosis in the market workers**

Criteria	Female workers
Scoliosis	7
Non-scoliosis	108
Total	115
Prevalence of scoliosis	0.061



**Figure 1.** A woman carrying basket filled with vegetables

## DISCUSSION

The lifting technique used by the market workers is carrying the loads over their heads while supporting the load using their hands. This however, is only seen in female market workers. Male market workers are not involved in the heavy lifting that women do. Therefore, the main focus will be on female market workers with certain aspects to compare with the male market workers.

In this study, it was discovered throughout the study period there are more female workers than male workers in Pasar Kumbasari. The heavy lifting of weights and objects are done by women. Men also help carry loads but it is usually from the lorries to distribute to other people or to carry the loads off the lorry to the ground. Many women workers are seen carrying heavy loads on their heads throughout Pasar Kumbasari whilst men help to move lorries to make space for the workers to set up their stalls.

Throughout the period of study, it was discovered that the weights that the women carry are excessive. In some women, it is extremely excessive that it could pose serious health problems. All women who are seen carrying loads on their heads complained of pain in their shoulders, lower back and legs. This is mainly due to their old age which results in decreased synovial fluid in the joints, resulting in pain when carrying loads in long periods of time. Scoliosis may be just one of the many possible disorders that could occur in these workers.

In addition, the bone density of men is higher compared to women since the bone density in women starts to decrease as after menopause. This is also another reason as to why there were women with scoliosis but no men with scoliosis. Men that were interviewed also stated that they had lower back pain, pain at their shoulders and legs. Mainly their old age and decreased rate of healing contribute to the pain that these workers are suffering from. Women are also more susceptible to osteoporosis than men, leading to greater loss of bone density in women than men as they get older.

In the earlier sections, many aspects have been discussed in regard to scoliosis. In other parts of the world there are workers who are used as human labourers for menial jobs such as working in the brick fields. There are workers in Mumbai, India and West Bengal, India that have been discussed about their jobs. Female workers in West Bengal are involved in laying bricks and male workers in Mumbai are involved in municipal waste loaders. These two groups of people are from the low socioeconomic and education status. Most of the workers have complaints of pain in their joints and

low back pain. In addition, they are also reported to be working under the hot sun.

The next group of workers that will be discussed are obstetrics and gynaecologists from China. From the study it was found that these doctors have complaints of low back pain, wrist pain and leg pain. This group of people are from the higher socioeconomic and education status. Their workplace was also reported to be conducive for almost all the specialists. However, these specialists tend to stand for many hours a day when operating. As for their working hours, they work at an average of 7 hours daily.

Based on the two groups that are being compared we can see that there are many other factors besides the physical exertion that should be taken account into when considering if the person is susceptible in getting scoliosis. Both groups are reported to be working about the same duration of working periods. The differences are quite clear in their working environment, work load, amount of rest they get after work and their socioeconomic and education status.

In my research, the workers are from low socioeconomic and education status. As for their working hours they work in excess of 8 to 9 hours daily with some rest in between when there are less people coming to the market. Not all the workers that I've interviewed stand for long periods of time but they do carry excessive weights that cause pain on their neck and shoulders, lower back and legs. In relation to the workers around the world that have been discussed earlier, these market workers are in risk of developing scoliosis over time. They will probably have more frequent low back pain and joint pains before a significant deformity arises within their spine.

## CONCLUSION

In conclusion, the prevalence of scoliosis in female market workers in Pasar Badung is 0.061. As for the technique of lifting the weights, it was found that weights were carried on their heads.

## LIMITATIONS

Although this study managed to obtain the objective of this study, there were quite a number of constraints that slowed the progress of this study. Many of the workers were not interested in entertaining this study unless if I had to go and buy something from their shop. In addition, when requested for photographic evidence the women in particular were shy and not cooperative in allowing me to take some shots as proof for my study. There were also workers who fit the inclusion

criteria for this study but did not want to participate in the research.

Data such as weight of the workers is also required in order to determine if the weight carried exceeds 10% of the body weight. This was the hardest data to obtain as they are not at all open and interested in revealing their body weight. This may have reduced the strength of data obtained but a rough approximation was made regarding to the body of the market workers. This too, however is subjective according to person who is making the approximation.

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