# Report on Case study for analytics - healthcare industry

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At the first step I compared the average total cost treatment of ulcers in different parts of the body using both of hydrocellular (Hce) and hydrocolloid (Hco) dressing's method and the table.1 and Figure.1 shows the results.

| | Hydrocolloid | Hydrocellular | Sample number Hydrocolloid | Sample number Hydrocellular | Different between A and B |
|---|---|---|---|---|---|
| Sacrum | 97.084 | 81.634 | 37 | 38 | 19% |
| Gluteus | 87.366 | 86.523 | 19 | 21 | 0 |
| Heel | 107.030 | 118.312 | 13 | 6 | -10% |
| Trochanter | 75.425 | 65.806 | 9 | 6 | 14% |
| Malleolus | 86.504 | 92.646 | 3 | 4 | -7% |
| Other | 93.640 | 102.47 | 4 | 9 | -9.5% |

Table 1.Average Treatment Cost of different type of Ulcer

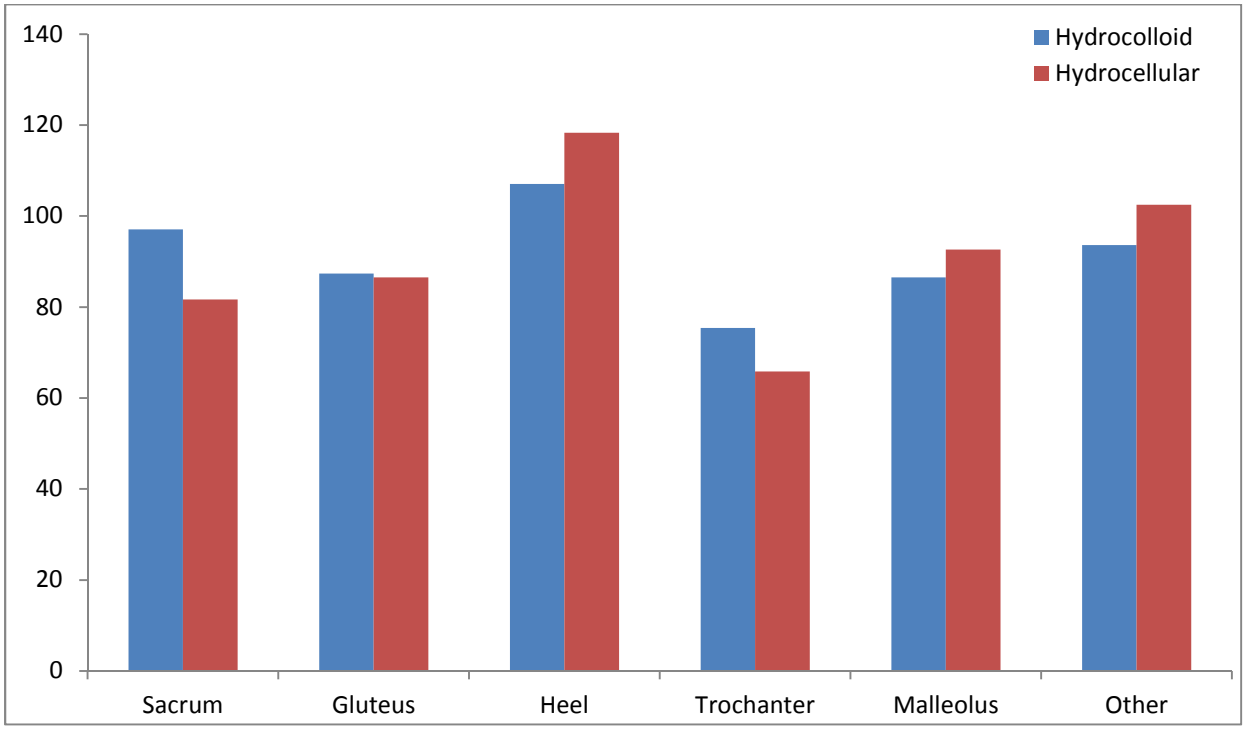


Figure 1. Average Treatment Cost of different type of Ulcer

This table shows that the number of sacrum is the highest type of ulcers and the average cost of treatment in the Hco method is about 19% higher than the Hce method. Also, in Trochanter cases the average treatment cost using Hce is 14% less than Hco but in Heel, Malleolus and Other cases the average treatment cost of Hco is less.

In the next step I added the sexual parameters of the patient to the analysis and significant results obtained which shows in table.2 and Figure.2.
This table shows that the gender of the patient is a very influential parameter on the costs of treatment methods.

| | Hydrocolloid male | Hydrocellular male | Hydrocolloid female | Hydrocellular female |
|---|---|---|---|---|
| Sacrum | 113.212 | 75.871 | 87.267 | 86.820 |
| Gluteus | 69.501 | 82.089 | 103.444 | 89.252 |
| Heel | 138.902 | 60.207 | 101.235 | 147.364 |
| Trochanter | 58.555 | 73.342 | 80.245 | 50.733 |
| Malleolus | 83.042 | 53.532 | 93.428 | 131.760 |
| Other | 90.435 | 118.729 | 103.255 | 82.164 |

Table 2. Average Treatment Cost of different type of Ulcer Based on Gender

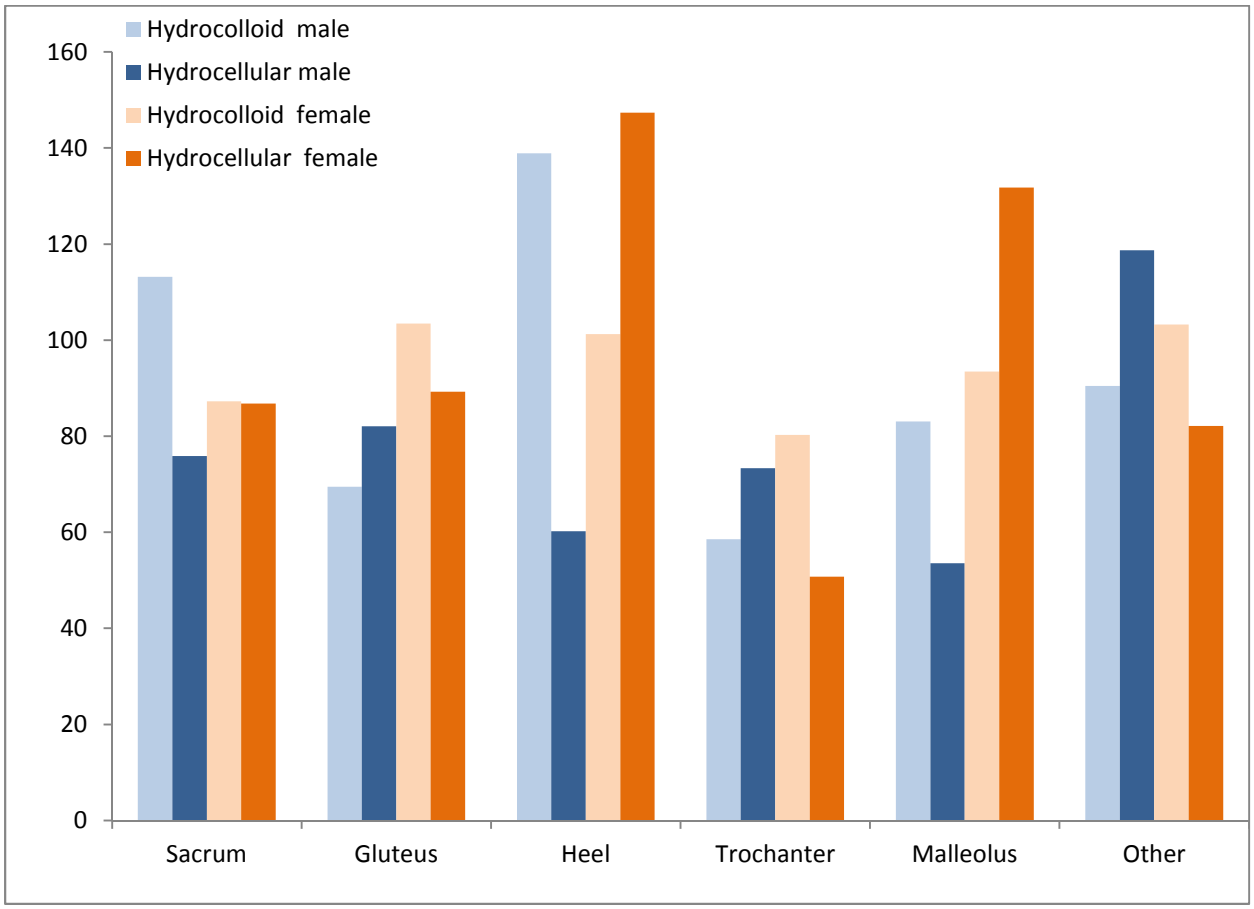


Figure 2. Average Treatment Cost of different type of Ulcer Based on Gender

Figure 3 shows the frequency of each type of ulcer depending on the gender of the patients. One of the interesting parameter is the heel ulcer, which is much more in women than the men, which may be due to women's shoes.

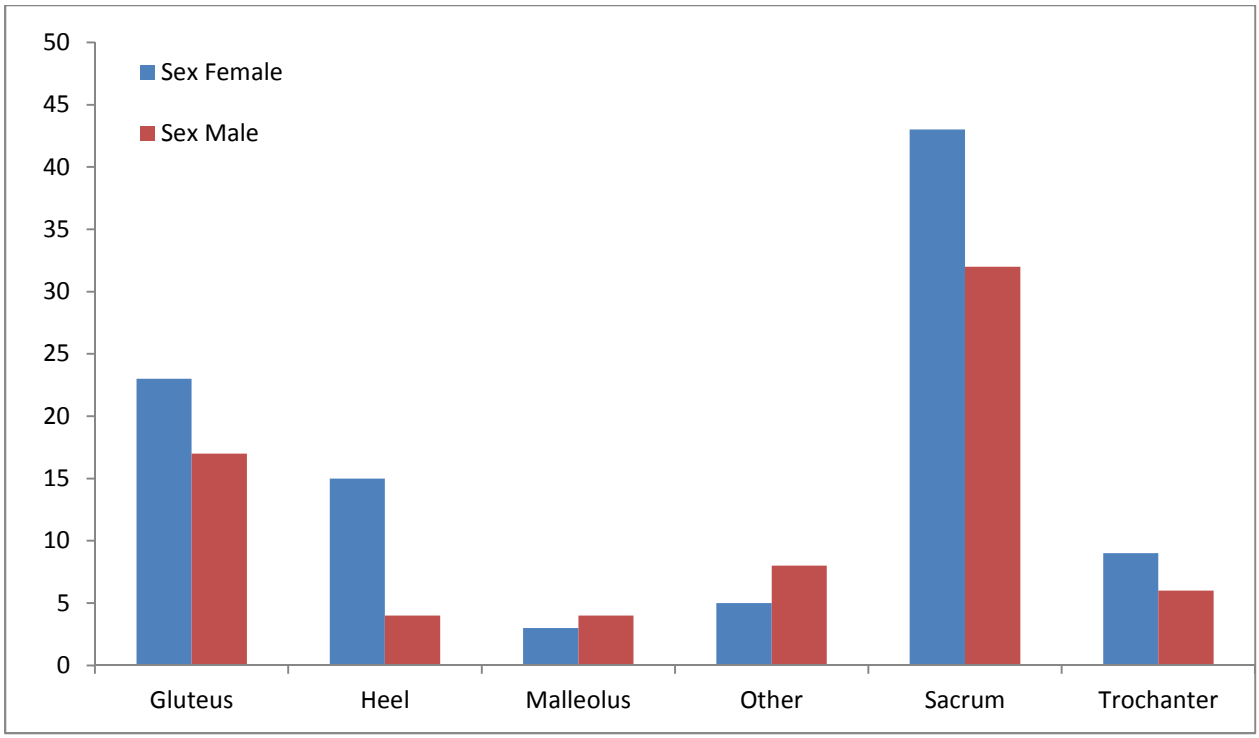


Figure 3. frequency of each type of ulcer depending on the gender

From the point of view of machine learning, it is very useful to have a model that can predict treatment costs based on different parameters such as gender, age, type of disease and different treatment methods. Also, this model can take into account parameters that make the patient more well-being, such as the length of the treatment period, the number of visits required to the clinic, the conditions of the patient's trip to the clinic.

One of the priorities of medical science is disease prevention. An intelligent system can predict the possibility of ulcer based on various data such as age, activity, weight and diseases that aggravates the ulcer such as Diabetes and provide the necessary recommendations to the patient. With this method, it is possible to prevent the occurrence of disease and the costs caused by it .

With the help of an intelligent system, based on various parameters such as age, gender and treatment method, it is possible to predict the length of treatment and the number of times required to change the dressing and the time interval required to change the dressing.

Parameters that can help improve data analysis and pattern design using machine learning include:

- Height and weight of the patient
- The number of times to change the dressing (if it is different from the Visiting parameters)
- Duration of treatment
- Exacerbating diseases such as diabetes
- The amount of physical activity