**Supplementary Table 4:** Bigram frequency analysis with at least one word identified by NLTK library in the worst reviews.

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| --- | --- | --- | --- |
| **Bigram** | **Frequency** | **Bigram** | **Frequency** |
| No Pain | 156 | Horrible Experience | 10 |
| Shoulder Pain | 48 | Chronic Pain | 9 |
| Pain Free | 44 | Nerve Damage | 9 |
| Severe Pain | 32 | Torn Bicep | 8 |
| Torn Rotator | 21 | No Nonsense | 8 |
| No One | 16 | No Longer | 8 |
| Shoulder Injury | 14 | Pain Suffering | 8 |
| No Relief | 14 | Still Pain | 8 |
| Pain No | 14 | Arrogant Condescending | 8 |
| Excruciating Pain | 14 | Waste Time | 8 |
| Pain Shoulder | 13 | No Apology | 8 |
| Motion No | 13 | Pain Limited | 8 |
| Pain Discomfort | 12 | Limited Range | 8 |
| Pain Dr. | 12 | No Doubt | 8 |
| Pain Surgery | 12 | Pain Not | 8 |
| Little Pain | 12 | Horrible Pain | 8 |
| Constant Pain | 11 | Nothing Wrong | 7 |
| Pain Killers | 10 | Dr. Bad | 7 |
| Shoulder Problem | 10 | Completely Torn | 7 |
| Pain Meds | 10 | Absolutely No | 7 |
| Worst Experience | 10 | Pain Full | 7 |
| No Interest | 10 | Getting Worse | 7 |
| Less Pain | 10 | "Nt" Happier | 7 |
| Knee Pain | 10 | Surgery No | 7 |
| No Problem | 10 | Wasting Time | 7 |