

Table 1. Characteristics of included studies

| study | Design | Procedures | Sample size | Age (year) | Sex (M/F) | side (R/L) | BMI, kg/m ² | Stone Size, mm |
|------------------------|---------|---------------|-------------|-----------------|-----------|------------|------------------------|----------------|
| Bozzini, G. 2020 | RCT | Mini-PCNL | 47 | 55.8 | 20/27 | 22/25 | | 16.82 |
| | | Standard-PCNL | 44 | 53.3 | 23/21 | 25/19 | | 16.38 |
| Cheng, F. 2010 | RCT | Mini-PCNL | 72 | 37.2 | 39/33 | 43/29 | | |
| | | Standard-PCNL | 115 | 39.6 | 63/52 | 67/48 | | |
| Du, C. 2018 | RCT | Mini-PCNL | 304 | 41.2± 16.9 | 181/123 | 147/157 | | |
| | | Standard-PCNL | 297 | 44.5± 18.7 | 179/118 | 151/146 | | |
| Guler, A. 2019 | RCT | Mini-PCNL | 51 | 46.9± 13.7 | 29/22 | 29/22 | 28.5± 5.6 | 38.7± 13.1 |
| | | Standard-PCNL | 46 | 47.4± 13.9 | 23/23 | 25/21 | 29.6± 5.9 | 42.8± 22.5 |
| Kandemir, E. 2020 | RCT | Mini-PCNL | 76 | 47.0± 13.9 | 50/26 | 40/36 | 28.6± 5.4 | 32.6± 8.1 |
| | | Standard-PCNL | 72 | 46.7± 14.2 | 48/24 | 35/47 | 28.4± 5.6 | 33.1± 10.9 |
| Kukreja, R. A. 2018 | RCT | Mini-PCNL | 61 | 41.95± 13.53 | | 33/28 | 27.1± 5.87 | 20.6± 3.47 |
| | | Standard-PCNL | 62 | 40.3± 14.2 | | 30/32 | 25.54 ±3.58 | 21.5± 3.53 |
| Sakr, A. 2017 | RCT | Mini-PCNL | 75 | 43.8 | 40/35 | 51/36 | 28.4 | 27 |
| | | Standard-PCNL | 75 | 40.2 | 52/23 | 33/48 | 27.8 | 26 |
| Tepeler, A. 2014 | RCT | Mini-PCNL | 10 | 47.2 | 4/6 | | 27.5 | 19.9 |
| | | Standard-PCNL | 10 | 44.3 | 6/4 | | 27.8 | 21.9 |
| Thakur, A. 2021 | RCT | Mini-PCNL | 30 | 34.5± 16.32 | 21/9 | | 26.32 ±5.10 | 17.9±5 |
| | | Standard-PCNL | 30 | 32.4± 12.6 | 17/13 | | 25± 5.16 | 19.4± 5.3 |
| Zeng, G. 2021 | RCT | Mini-PCNL | 992 | 51 | 526/466 | 500/492 | 24.4 | 29 |
| | | Standard-PCNL | 988 | 51 | 531/457 | 487/501 | 24.7 | 29 |
| Zhong, W. 2011 | RCT | Mini-PCNL | 29 | 41 | 14/15 | | | |
| | | Standard-PCNL | 25 | 38 | 11/14 | | | |
| Abdelhafez, M. F. 2016 | Non-RCT | Mini-PCNL | 71 | 52 | 37/34 | 29/42 | 26.2 | 38.6 |
| | | Standard-PCNL | 62 | 58 | 31/31 | 21/41 | 26.4 | 38.2 |
| ElSheemy, M. S. 2019 | Non-RCT | Mini-PCNL | 378 | 37.08± 12.62 | 137/241 | 206/172 | 27.2± 2.22 | |
| | | Standard-PCNL | 151 | 43.42± 13.21 | 58/93 | 75/76 | 27.03 ±2.16 | |
| Hamamoto, S. 2014 | Non-RCT | Mini-PCNL | 19 | 48.9 | 12/7 | 5/14 | 24.8 | |
| | | Standard-PCNL | 82 | 53.2 | 66/16 | 22/60 | 24.6 | |
| Khadgi, S. 2021 | Non-RCT | Mini-PCNL | 83 | 43.7± 13.9 | 44/39 | 36/47 | 29± 3.3 | |
| | | Standard-PCNL | 70 | 51.9± 9.7 | 32/38 | 21/41 | 34±6 | |

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|-------------------------------|---------|---------------|-----|---------------|-------|-------|--------------|---------|
| Knoll, T. 2010 | Non-RCT | Mini-PCNL | 25 | 52± 11.6 | 16/9 | | 27± 3.5 | 18±3.3 |
| | | Standard-PCNL | 25 | 48± 15.5 | 17/8 | | 29± 5.6 | 22±4.25 |
| Li, L. Y. 2010 | Non-RCT | Mini-PCNL | 93 | 51.5 | 56/37 | 48/45 | | 28.6 |
| | | Standard-PCNL | 72 | 49.2 | 43/29 | 31/41 | | 30.4 |
| Mishra, S. 2011 | Non-RCT | Mini-PCNL | 26 | 42.2± 19.8 | 18/8 | 8/19 | 23.8± 2.6 | |
| | | Standard-PCNL | 26 | 48.2± 16.8 | 18/8 | 10/18 | 22.6± 2.7 | |
| Sabnis, R. B. 2020 | Non-RCT | Mini-PCNL | 11 | 40.2± 15.1 | 5/6 | | | |
| | | Standard-PCNL | 20 | 49.2± 11.5 | 16/4 | | | |
| Wu, C. 2017 | Non-RCT | Mini-PCNL | 114 | 47.6± 8.2 | 69/45 | 59/55 | 23.0± 2.7 | 34±10 |
| | | Standard-PCNL | 114 | 48.1± 7.9 | 68/46 | 55/59 | 22.8± 2.8 | 33±11 |
