**Supplementary materials**

Table S1. Quality assessment of included studies

Figure S1. Funnel plot of pooled prevalence of poor sleep quality in Parkinson’s disease patients

Figure S2. Sensitivity analysis of pooled prevalence of poor sleep quality in Parkinson’s disease patients

**Table S1.** Quality assessment of included studies

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Authors and citation No. | Target population is clearly defined? | probability sampling OR entire population surveyed | Is the response rate ≥80% | Are non-responders clearly described? | Do the characteristics of respondents match the target population? | Were data collection methods standardized? | Were validated criteria used to diagnose poor sleep quality？ | Are the prevalence estimates given with confidence intervals and detailed by subgroups (if applicable)? | Total scores |
| Ma and Ren 76 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 5 |
| Chen, Zhang, Zhou, Yang and Feng 77 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 4 |
| Chen, Hu, Han, Zhang and Zhang 78 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 4 |
| Chen, Hong and Chen 79 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 4 |
| Guo, Yu, Zuo, Liu, Li, Pu, Hu, Lian, Wang, Yu, Jin, Zhu and Zhang 80 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 4 |
| Guo 81 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 4 |
| Yuan, Hu, Zhao, Wang, Zhang and Li 82 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 4 |
| Xue 83 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 4 |
| Hu and Zhang 84 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 4 |
| Cheng, Yu and Wu 85 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 4 |
| Wang, Feng, Gu, Liu and Chen 86 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 5 |
| Wang, Feng, Gu, Liu, Zhang and Chen 87 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 5 |
| Wang and Wang 88 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 5 |
| Wang, Sun, Ma, Shi, Li, Huang, Hu and Zheng 89 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 4 |
| Mao and Zhang 90 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 4 |
| Mao, Dai and Liu 91 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 4 |
| Mao and Saimaiti 92 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 3 |
| Liang, Cui, Wu, Yu and Chen 93 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 4 |
| Zhu, Zheng and Yang 94 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 5 |
| Cao, Liu, Ma, Chen, Ren, Zhang and Xu 95 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 4 |
| Cao, Yu, Su and Guo 96 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 4 |
| Zhang, Gao and Wei 97 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 4 |
| Zhang, Zhang, Zhu, Jiang and Wu 98 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 4 |
| Zhang, Liu, Wang, Liu and Gu 99 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 5 |

**Table S1.** Quality assessment of included studies. (continued)

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Authors and publication year | Target population is clearly defined? | probability sampling OR entire population surveyed | Is the response rate ≥80% | Are non-responders clearly described? | Do the characteristics of respondents match the target population? | Were data collection methods standardized? | Were validated criteria used to diagnose poor sleep quality？ | Are the prevalence estimates given with confidence intervals and detailed by subgroups (if applicable)? | Total scores |
| Zhang, Luo and Liao 100 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 4 |
| Cui, Qing, Liu and Chen 101 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 5 |
| song, Zhao, Li and Yin 102 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 4 |
| Song, Sun, Ma, Lu, Fan, Wang, Wang and Wang 103 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 5 |
| Sun, Gao, Mo and Gong 104 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 4 |
| Lv, Wang, Zhu, Zhao and Guo 18 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 5 |
| Lu 105 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 4 |
| Liu and Chen 106 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 4 |
| Liu, Li, Fang, Qin and Wei 107 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 4 |
| Liu, Chou, Ma, Zhang, Wang and Gu 108 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 5 |
| Liu, Wang, Wang, Mao and Wang 109 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 4 |
| YU, PENG, LUO, HUANG and WANG 110 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 4 |
| Yi, Yu-Peng, Jiang-Ting, Jing-Yi, Qi-Xiong, Dan-Lei, Jing-Wei, Zhi-Juan, Yong-Jie, Zhe and Zheng 111 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 5 |
| Wang, Xiong, Chao, Zhuang, Li and Liu 112 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 5 |
| Tang, Yang, Zhu, Gong, Sun, Chen, Guan, Yu, Wang, Zhang, Li, Ma and Wang 113 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 5 |
| Song, Gu, An and Chan 114 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 4 |
| Shulman, Taback, Bean and Weiner 115 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 6 |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Authors and publication year | Target population is clearly defined? | probability sampling OR entire population surveyed | Is the response rate ≥80% | Are non-responders clearly described? | Do the characteristics of respondents match the target population? | Were data collection methods standardized? | Were validated criteria used to diagnose poor sleep quality？ | Are the prevalence estimates given with confidence intervals and detailed by subgroups (if applicable)? | Total scores |
| Santos García, Cabo López, Labandeira Guerra, Yáñez Baña, Cimas Hernando, Paz González, Alonso Losada, Gonzalez Palmás, Cores Bartolomé and Martínez Miró 19 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 4 |
| Sahebzadeh, Farsi Baf and Homam 116 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 6 |
| Qiu, Gu, Liu and Li 117 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 4 |
| Qin, Li, Chen, Chen, Shi, Liu, Li, Xin and Gao 118 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 4 |
| Pandey, Bajaj, Wadhwa and Anand 17 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 4 |
| Mahale, Yadav and Pal 119 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 4 |
| Louter, van der Marck, Pevernagie, Munneke, Bloem and Overeem 120 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 4 |
| Lin, Chen, Lu, Huang, Weng, Yeh, Lin and Hung 121 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 5 |
| Havlikova, van Dijk, Nagyova, Rosenberger, Middel, Dubayova, Gdovinova and Groothoff 122 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 0 | 5 |
| Gao, Huang, Cai and Li 123 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 4 |
| Duncan, Khoo, Yarnall, O'Brien, Coleman, Brooks, Barker and Burn 124 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 4 |
| Ding, Zhu, Lu, Shen, Dai and Zhu 125 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 4 |
| Shafazand, Wallace, Arheart, Vargas, Luca, Moore, Katzen, Levin and Singer 126 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 4 |

**Table S1.** Quality assessment of included studies. (continued)

**Table S1.** Quality assessment of included studies. (continued)

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Authors and publication year | Target population is clearly defined? | probability sampling OR entire population surveyed | Is the response rate ≥80% | Are non-responders clearly described? | Do the characteristics of respondents match the target population? | Were data collection methods standardized? | Were validated criteria used to diagnose poor sleep quality？ | Are the prevalence estimates given with confidence intervals and detailed by subgroups (if applicable)? | Total scores |
| Skorvanek, Nagyova, Rosenberger, Krokavcova, Saeedian, Groothoff, Gdovinova and van Dijk 127 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 4 |
| Shi, Guan, Gao, Huang and Wang 128 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 4 |
| Dong and Tan 129 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 4 |
| Chang, Fan, Chang and Wu 130 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 4 |
| Shi 131 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 4 |
| Li, Yuan, Ye, Yuan, Gao and Hu 132 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 4 |
| Gui, Wang, Wu and Sun 133 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 4 |
| Hu, Sun, Lan, Wang, Li and Zhong 134 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 4 |
| Niu and Gou 135 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 4 |

**Figure S1.** Funnel plot of pooled prevalence of poor sleep quality in Parkinson’s disease patients



Funnel plot of pooled prevalence of poor sleep quality from 63 included studies (Egger’s test *t* = 1.42, *P*= 0.1608)

**Figure S2.** Sensitivity analysis of pooled prevalence of poor sleep quality in Parkinson’s disease patients

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