

Economic Burden of Young Onset Parkinson’s Disease (YOPD): A Systematic Review

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Introduction and Objectives

- Young-Onset Parkinson’s disease (YOPD) is a rare subtype of Parkinson’s disease (PD) characterized by the onset of motor symptoms occurring below 50 years of age. ¹
- PD presents a major economic burden to patients and wider society, but limited evidence exists regarding the economic burden of YOPD. ¹
- This study aims to determine the economic burden of patients who are affected by PD at a young age.

Methodology

- A literature search was conducted in Embase® and MEDLINE® via Ovid to identify English language articles published from 2011 to 6th of May 2022 using “Parkinson disease”, “hospitalization cost”, “direct cost”, “indirect cost” terms.
- All the identified studies were screened based on the title/abstracts and followed by full-text screening against the eligibility criteria (Table 1) and data extraction by one reviewer.

Table 1: Study eligibility criteria

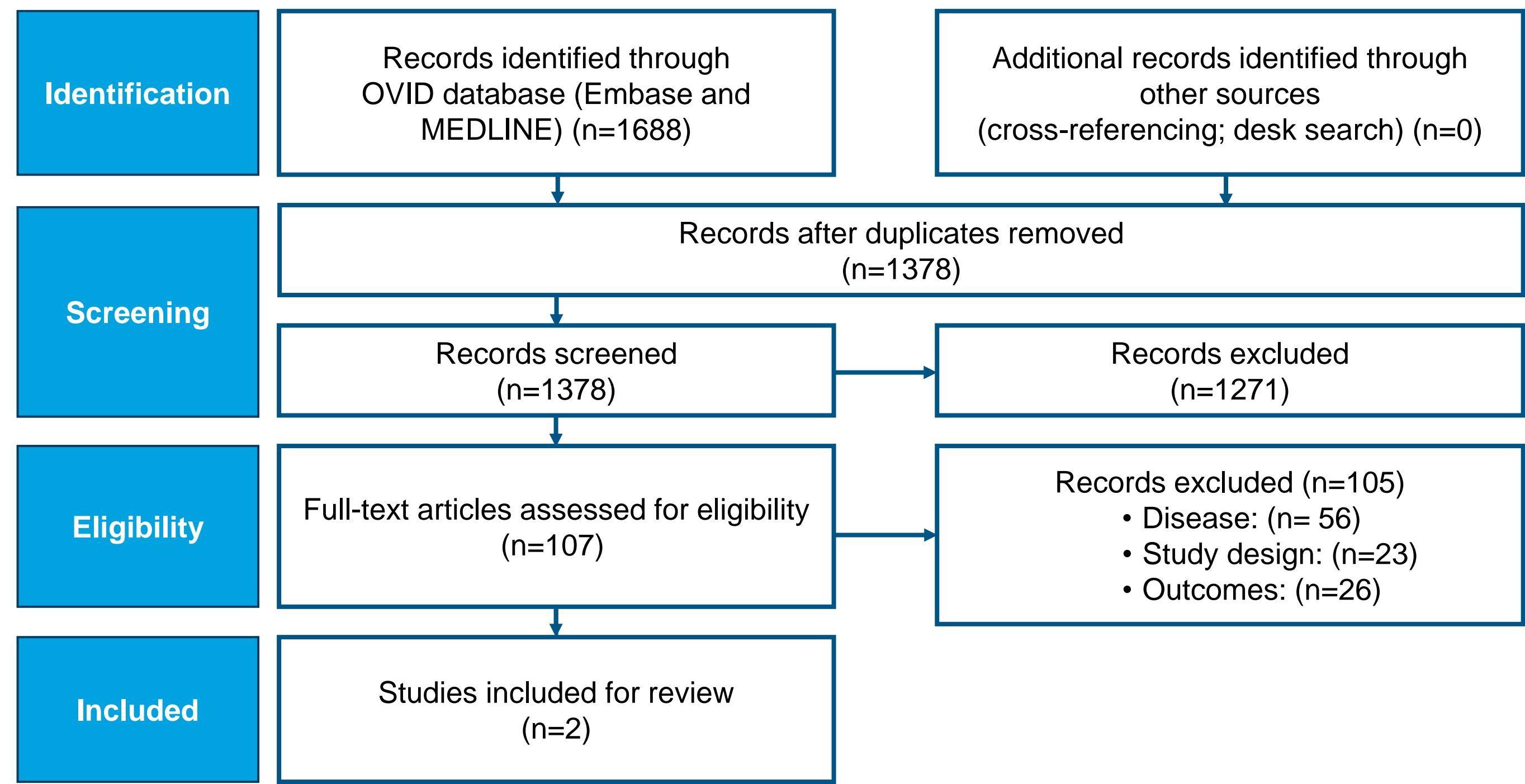
PICOS	Inclusion criteria
Population	Adults (<50 years of age) who are diagnosed with YOPD
Intervention/Comparator	No restriction
Outcome	Direct costs, Direct non-medical costs, Indirect costs, Intangible costs, Loss of productivity and Personal costs
Study design	Clinical trials (any phase), cohort study (retrospective or prospective), observational study (retrospective or prospective), case-control study

Results

Study Selection:

- After removing duplicates, 1,378 records were obtained through databases and additional searches.
- A total of two studies were included for the review (Figure 1).

Figure 1: PRISMA chart of included studies



Results

Reported direct and indirect medical cost for YOPD:

- Two US based studies met the inclusion criteria.
- Using information from nationally representative surveys, Kowal et al. 2013 reported the total mean direct medical costs of \$136,000,000 (\$13,344 per patient) in 2010 for patients aged 20-44 years. ²
- Accordingly, total estimated mean indirect medical costs were \$168,000,00 (\$16,164 per patient). Furthermore, there was a significant increase in productivity loss due to missed workdays (Coefficient: 1.06, standard error: 0.52, p=0.042). ²
- Using administrative claims data for 2014 and 2015, Prada et al. 2020 reported that median direct costs per patient for patients aged 30-39 years increased by 75% in 2015 (p=0.094), from \$710 (IQR: \$2,016-282) to \$1,244 (IQR: \$2,880-811). ³
- Likewise, for patients aged 40-49 years, median direct costs per patient increased by 80% in 2015 (p=0.424), from \$909 (IQR: \$2,839-380) to \$1,633 (IQR: \$3,178-377). ³
- More detailed results represented in Table 2.

Table 2: Key economic outcomes from included studies for young onset (advanced) PD

Study first author (N)	Location	Main Endpoints
Prada et al. (106)	US (Colombia)	Direct medical cost to healthcare system for 30-39 years of age: Median: \$1,244, IQR (Q3-Q1): 2880-811, Median % increased: 75, p-value: 0.094. Direct medical cost to healthcare system for 40-49 years of age: Median: \$1,633, IQR (Q3-Q1): 3178-377, Median % increased: 80, p-value: 0.424.
Kowal et al. (20,800)	US	For 20-24 years of age: Direct mean medical cost to healthcare system: \$136,000,000, Direct mean medical cost per patient: \$13,344, Indirect mean medical cost to healthcare system: \$168,000,000, Total indirect mean medical cost per patient: \$16,164, Estimating workdays missed because of illness: Co-efficient 1.058, Standard error 0.521; p-value 0.042.

*N = number of patients
Abbreviations: PD (Parkinson’s Disease), \$ (US dollar), Q3 (75th percentile of included population), Q1 (21st percentile of included population), US (United States).

Conclusion

- In both the studies costs were substantially higher in PD patients aged <50 years.
- Limited evidence was available on the economic burden in YOPD patients, which inhibited to drawing of reliable conclusions.
- More studies are needed to fully assess the economic impact of YOPD concerning direct and indirect costs.

References:
1. <https://www.hopkinsmedicine.org/health/conditions-and-diseases/parkinsons-disease/youngonset-parkinsons-disease#:~:text=It's%20not%20common%20to%20see,%20onset%20Parkinson's%20C%20or%20YOPD.>
2. Kowal SL, Dall TM, Chakrabarti R, Storm MV, Jain A. The current and projected economic burden of Parkinson's disease in the United States. *Mov Disord.* 2013;28(3):311-318. doi:10.1002/mds.25292.
3. Prada SI, Pérez AM, Valderrama-Chaparro J, Molina-Echeverry MI, Orozco JL, Takeuchi Y. Direct cost of Parkinson's disease in a health system with high judicialization: evidence from Colombia. *Expert Rev Pharmacoecon Outcomes Res.* 2020;20(6):587-593. doi:10.1080/14737167.2020.1681266.