Supplementary Material 1. PRISMA Checklist[28]

Section and Topic	Item #	Checklist item	Location where item is reported
TITLE			
Title	1	Identify the report as a systematic review.	Pg. 1
ABSTRACT			
Abstract	2	See the PRISMA 2020 for Abstracts checklist.	Pgs. 3-4
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of existing knowledge.	Pgs. 5-6
Objectives	4	Provide an explicit statement of the objective(s) or question(s) the review addresses.	Pgs. 5-6
METHODS			
Eligibility criteria	5	Specify the inclusion and exclusion criteria for the review and how studies were grouped for the syntheses.	Pgs. 7-8
Information sources	6	Specify all databases, registers, websites, organisations, reference lists and other sources searched or consulted to identify studies. Specify the date when each source was last searched or consulted.	Pgs. 8-9
Search strategy	7	Present the full search strategies for all databases, registers and websites, including any filters and limits used.	Pgs. 8-9, Supplementary Material 2
Selection process	8	Specify the methods used to decide whether a study met the inclusion criteria of the review, including how many reviewers screened each record and each report retrieved, whether they worked independently, and if applicable, details of automation tools used in the process.	Pg. 9
Data collection process	9	Specify the methods used to collect data from reports, including how many reviewers collected data from each report, whether they worked independently, any processes for obtaining or confirming data from study investigators, and if applicable, details of automation tools used in the process.	Pgs. 9-11
Data items	10a	List and define all outcomes for which data were sought. Specify whether all results that were compatible with each outcome domain in each study were sought (e.g. for all measures, time points, analyses), and if not, the methods used to decide which results to collect.	Pg. 7
	10b	List and define all other variables for which data were sought (e.g. participant and intervention characteristics, funding sources). Describe any assumptions made about any missing or unclear information.	Pg. 7
Study risk of bias assessment	11	Specify the methods used to assess risk of bias in the included studies, including details of the tool(s) used, how many reviewers assessed each study and whether they worked independently, and if applicable, details of automation tools used in the process.	Pg. 10
Effect measures	12	Specify for each outcome the effect measure(s) (e.g. risk ratio, mean difference) used in the synthesis or presentation of results.	Pgs. 7-9
Synthesis methods	13a	Describe the processes used to decide which studies were eligible for each synthesis (e.g. tabulating the study intervention characteristics and comparing against the planned groups for each synthesis (item #5)).	Pgs. 10-11
	13b	Describe any methods required to prepare the data for presentation or synthesis, such as handling of missing summary statistics, or data conversions.	Pgs. 10-11
	13c	Describe any methods used to tabulate or visually display results of	Pgs. 10-11

Section and Topic	Item #	Checklist item	Location where item is reported
		individual studies and syntheses.	
	13d	Describe any methods used to synthesize results and provide a rationale for the choice(s). If meta-analysis was performed, describe the model(s), method(s) to identify the presence and extent of statistical heterogeneity, and software package(s) used.	Pgs. 10-11
	13e	Describe any methods used to explore possible causes of heterogeneity among study results (e.g. subgroup analysis, meta-regression).	Pg. 11
	13f	Describe any sensitivity analyses conducted to assess robustness of the synthesized results.	Pg. 11
Reporting bias assessment	14	Describe any methods used to assess risk of bias due to missing results in a synthesis (arising from reporting biases).	Pg. 9
Certainty assessment	15	Describe any methods used to assess certainty (or confidence) in the body of evidence for an outcome.	Pgs. 9-10
RESULTS			
Study selection	16a	Describe the results of the search and selection process, from the number of records identified in the search to the number of studies included in the review, ideally using a flow diagram.	Pgs. 11-12, Figure 1
	16b	Cite studies that might appear to meet the inclusion criteria, but which were excluded, and explain why they were excluded.	Figure 1
Study characteristics	17	Cite each included study and present its characteristics.	Pgs. 13-14, Table 1, Table 2, Figure 3
Risk of bias in studies	18	Present assessments of risk of bias for each included study.	Figure 2, Supplementary Materials 3
Results of individual studies	19	For all outcomes, present, for each study: (a) summary statistics for each group (where appropriate) and (b) an effect estimate and its precision (e.g. confidence/credible interval), ideally using structured tables or plots.	Table 1, pgs. 14-22
Results of syntheses	20a	For each synthesis, briefly summarise the characteristics and risk of bias among contributing studies.	Pgs. 14-22
	20b	Present results of all statistical syntheses conducted. If meta-analysis was done, present for each the summary estimate and its precision (e.g. confidence/credible interval) and measures of statistical heterogeneity. If comparing groups, describe the direction of the effect.	N/A
	20c	Present results of all investigations of possible causes of heterogeneity among study results.	Pgs. 14-22
	20d	Present results of all sensitivity analyses conducted to assess the robustness of the synthesized results.	Pgs. 15, 18
Reporting biases	21	Present assessments of risk of bias due to missing results (arising from reporting biases) for each synthesis assessed.	Pgs. 11-15, 26, Supplement 3
Certainty of evidence	22	Present assessments of certainty (or confidence) in the body of evidence for each outcome assessed.	Pgs. 14-22
DISCUSSION			
Discussion	23a	Provide a general interpretation of the results in the context of other evidence.	Pgs. 22-24
	23b	Discuss any limitations of the evidence included in the review.	Pgs. 25-26
	23c	Discuss any limitations of the review processes used.	Pgs. 25-25
	23d	Discuss implications of the results for practice, policy, and future research.	Pgs. 26-27
OTHER INFORMATION			
Registration and protocol	24a	Provide registration information for the review, including register name and registration number, or state that the review was not registered.	Pgs. 4, 7

Section and Topic	Item #	Checklist item	Location where item is reported
	24b	Indicate where the review protocol can be accessed, or state that a protocol was not prepared.	Pgs. 8-9, Supplementary Materials 2
	24c	Describe and explain any amendments to information provided at registration or in the protocol.	Pgs. 8-9, Supplementary Materials 2
Support	25	Describe sources of financial or non-financial support for the review, and the role of the funders or sponsors in the review.	Pg. 2
Competing interests	26	Declare any competing interests of review authors.	Pg. 2
Availability of data, code and other materials	27	Report which of the following are publicly available and where they can be found: template data collection forms; data extracted from included studies; data used for all analyses; analytic code; any other materials used in the review.	N/A

(28) Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. BMJ 2021;372:n71. doi: 10.1136/bmj.n71

Supplementary Material 2. Full Search Strategy

OBJECTIVES:

To identify the impacts of PE acquisition on healthcare outcomes, quality, costs to patients or payers, and costs to operators.

SCOPE:

The scope of the review is listed below, outlined according to the PICO (Participants, Intervention, Comparators, Outcomes) framework:	
Participants:	Healthcare operators providing clinical services (e.g., clinics, practices, hospitals) in any global setting.
Intervention:	PE ownership
Comparator(s):	Non-PE-owned institutions
Outcomes:	
Primary Outcome Measures	Impacts on healthcare outcomes, quality, costs to patients or payers, and costs to operators
Secondary outcome Measure	Prevalence/market share of PE-affiliated institutions

METHODS:

Study Eligibility

Inclusion Criteria:	
Study Characteristics	Empirical research studies (e.g., cross-sectional, longitudinal, quasi-experimental)
	Evaluating PE-affiliated healthcare institutions providing clinical services
	Global geographic setting
	Years of analysis between 2000-2023
Report Characteristics	Published between 2000-2023
	Published in English
Exclusion criteria:	Non-clinical healthcare institutions (e.g. labs, medical device)
	Non-empirical (e.g., viewpoint, commentary, opinion)

Information Sources

Electronic Databases	PubMed SSRN Web of Science Embase Scopus
Additional Sources	Cited references in articles identified via electronic database searches.
Search Terms	
Healthcare-specific databases (e.g. PubMed)	"private equity" "dividend recapitalization" "limited partnership" "internal rate of return"
Non-healthcare-specific databases (e.g. SSRN)	"private equity" AND "health" OR "healthcare" "dividend recapitalization" AND "health" OR "healthcare" "limited partnership" AND "health" OR "healthcare" "internal rate of return" AND "health" OR "healthcare"

Supplementary Material 3: Trends in PE Ownership of Healthcare Operators.

Author(s) and year	Country	Participants	Time Frame	Findings Related to Secondary Outcomes (PE Prevalence or Activity)
August, 2022	Canada	Long-term care homes & retirement facilities	2003-2020	• By 2020, PE firms collectively held at least 187 properties and 21,551 senior housing suites and beds • 4 of the 20 largest owners of senior housing in 2020 were owned by PE, for a total of: 65 retirement living properties; 7,646 retirement living units; 52 long-term care properties; 4,176 long-term care beds; 101 total properties, and 11,822 total beds/units
Billig et al., 2021	USA	Surgical practices	2000-2020	• 101 unique PE firms made 193 investments, with 100 (52%) involving ambulatory surgical centers (ASCs) and 93 (48%) involving physician practices • 117 (61%) of investments led to acquisition • Number of investments increased by 0.65 each year ($p<0.001$) • Most acquisitions were initially in the South, but after 2016, equal geographic distribution across US census regions
Boddapati et al., 2022	USA	Orthopaedic practices and surgical groups	1999-2020	• 41 practices and/or surgeon groups across 22 states were acquired by 34 investment firms, predominantly by PE • Volume of acquisitions increased from 2017-2019, with 70.7% of all acquisitions occurring during this timeframe • Rate of growth was highest 2010-2019, with a 900% increase in annual acquisitions and annual growth rate of 29.2% • Majority (51.2%) of acquisitions were in the South • Acquisitions covered 24 metropolitan areas of varying sizes, with highest proportion in major metropolitan areas compared with mid-sized or rural (70.7% vs. 17.1% vs. 12.2%, $p<0.001$).
Borsa & Bruch, 2022	USA	Fertility practices	2018	• 66 practices (14.7%) have a PE affiliation • Concentrated on East and West coasts and in higher median income areas • PE practices comprise 14.7% of all practices and perform 29.3% of annual assisted reproductive technology (ART) cycles in the US
Bos et al., 2020	Netherlands	Nursing homes	2019	• In 2019, 20.5% of for-profit nursing homes contracted by the regional LTC office were owned by PE, and 3.5% of for-profits financed by personal budget were owned by PE
Braun et al., 2021[70]	USA	Hospice agencies	2011-2019	• 87 PE transactions from 2011-2019. • In 2011, 3.4% of hospice agencies were owned by PE, increasing to approximately 5.4% in 2019 • Among PE transactions, 72% of acquired agencies were previously non-profit • In 2012, 11% of all Medicare beneficiaries in hospice received care from either PE or publicly traded companies, increasing to 16% in 2019 (328% increase, $p<0.01$)
Braun et al., 2021[39]	USA	Dermatology practices	2012-2017	• In 2017, 1 in 11 dermatologists were at a PE-owned practice spanning over 26 states • Most concentrated states: Colorado, Florida, Texas, Pennsylvania, Wisconsin, Michigan • In 21 hospital referral regions, PE dermatologists provided more than 50% of services • 64 acquisitions occurred between 2013-2016
Braun et al., 2021[60]	USA	Nursing homes	2010-2020	• 79 PE transactions were identified over the study period, representing 302 nursing homes and 37 states, concentrated mostly in California, Kentucky, Massachusetts, Ohio, Tennessee, Texas, and Washington • In 2012, there were 289 nursing homes that were later acquired by PE firms and 7954 for-profit homes that were never acquired • From 2013-2017, PE acquired 302 nursing homes across 79 transactions

				• In 2018, there were 295 nursing homes owned by PE
Braun et al., 2020	USA	Nursing homes	2020	• Of 11,470 nursing homes total, 4.7% were PE-owned • 91.5% of PE-owned facilities were multifacility chains, higher than other ownership types
Broms, Dahlström, & Nistotskaya, 2023	Sweden	Nursing homes	2012-2019	• There were 237 PE-owned facilities across the study period, with a large concentration in Stockholm county in the east
Bruch et al., 2022	USA	ASCs	2011-2014	• PE acquired 91 ASCs over the study period 35% located in the South, 34% in the Midwest, 18% in the Northeast, and 13% in the West, predominantly in urban areas
Bruch et al., 2021	USA	Hospitals	2018	• 130 hospitals under PE control in 2018 • Within hospital referral regions, PE hospitals located in areas with higher rurality and lower median household incomes
Bruch et al., 2020[71]	USA	Fertility, OB/GYN practices	2010-2019	• 24 target companies acquired between 2010-2019, with a majority (17) taking place between 2017-2019 • 17 acquisitions of OB/GYN practices, 7 for fertility practices • At time of acquisition, 605 offices and 2,019 clinicians gained a PE affiliation; by 2019, count was 1,304 offices and 3,989 clinicians • Most acquisitions in the Northeast (45%) and South (43%)
Bruch et al., 2020[42]	USA	Hospitals	2005-2017	• 217 hospitals were acquired by PE between over the study period • Most PE-acquired hospitals were in the Southern US (61.3%), non-teaching (73%), for-profit (84.3%), and medium sized (56.4%)
Bůžek & Scheuplein, 2022	Germany	Physician Practices	2020	• In 2020, there were 17 PE-led physician practice chains/ownership groups, accounting for 60 medical care centers with 2420 employees across 148 locations • Of the chains operating in Bavaria in 2020, six entered the ambulatory care market in Germany between 2018 and 2020, five groups entered between 2013 and 2017, and 6 chains entered between 2007-2013 but went through at least one secondary buyout by 2020
Cerullo et al., 2021	USA	Hospitals	2004-2018	• 4.8% of hospitals in the sample were acquired by private equity • PE-affiliated hospitals were more likely to be urban, medium size, non-teaching, and for-profit
Chen et al., 2020	USA	Ophthalmology, optometry practices	2012-2019	• Over the study period, 29 PE-backed platform companies acquired 228 practices with 1,466 clinic locations and 2146 ophthalmologists & optometrists • Acquisition volume was relatively linear between 2012-2016 with 42 practices acquired, with an increase between 2017-2019, with 186 practices acquired • Acquisitions occurred in 40 states with most taking place in major metropolitan areas of the Midwest, Northeast, and Southeast • New York and California had the largest number of acquisitions (22 and 19, respectively)
Desai et al., 2022	USA	Opthalmology and Optometry	2021	• There were 12 related debt instruments identified prior to the COVID-19 pandemic, 8 acquired during the COVID-19 pre-vaccine period (March 2020 to December 2020), and 12 debt instruments during the post-vaccine period (February 2021 to March 2022), representing a 167% increase from pre-pandemic

Harrington et al., 2017	Canaday, Norway, Sweden, UK, USA	Nursing homes	2015-2016	• As of 2015-2016, 1 of the 5 top nursing home chains in Canada was PE-affiliated, another with past PE history • 1 of the 4 top nursing home chains in Norway was PE-affiliated, 2 more with past PE history • 2 of the 5 top chains in Sweden were PE affiliated, 1 more with past PE history • 4 of the 5 top chains in the UK were PE-affiliated • 3 of the top 5 chains in the US were PE-affiliated, 1 more with past PE history
Harrington et al., 2012	USA	Nursing homes	2003-2008	• In 2008, of the 1,977 facilities associated with top 10 largest nursing home chains in the country, 996 (50.4 %) of these were acquired by 4 PE companies between 2003-2008
Khetpal et al., 2021[75]	USA	Oral & maxillofacial surgery & dentistry practices	2011-2019	• PE deals were made with 206 practices and clinics over the study period • The total number of deals steadily increased over the timeframe • Of the above clinical operators, highest investment was in dental practices (n=154), then retail clinics (n=36) then oral surgery physician practices (n=16)
Khetpal et al., 2021[76]	USA	Plastic surgery practices	2011-2019	• PE deals were made with 226 practices and clinics over the study period • Deal count increased over the study period, but deal size decreased • Of the above clinical operators, highest investment was in dermatology physician practices (n=157), then retail clinics (n=38), then plastic surgery physician practices (n=31)
Konda et al., 2019	USA	Dermatology practices	2009-2018	• 34 dermatology groups were backed by PE, 2 of which were defunct by the end of the study period • 25 of the 33 groups were newly formed or acquired between 2015-2018
Liu, 2021	USA	Hospitals	2006-2019	• A total of 243 deals involving 838 hospital facilities were completed during the study period, with over half being add-on deals between an existing PE-backed hospital system and another facility • The majority of target hospitals were in urban areas and did not have teaching or critical access statuses • Approximately two-thirds of hospitals were for-profit before acquisition • Target hospitals were concentrated in the South and West, with high concentrations in Texas, Florida, and Tennessee
Memon et al., 2022	USA	Dermatology groups	2016-2021	• 10 Business Development Companies (BDCs) contained 15 debt instruments related to 9 unique dermatology PE-backed groups (DEPGs)
Mikhail et al., 2021	USA	Orthopedic surgery practices	2010-2019	• Of 68 total deals during the study period, 5 (7.4%) were PE-backed • Buyers and sellers were located in the same state in 73.5% of deals
Nie et al., 2022[80]	USA	Urology practices	2011-2021	• Of 69 urology practice acquisitions in the study period, 20 (29.9%) were by PE-backed platforms • PE firms initially targeted large practices (mean: 60.8 urologists) and consolidated market share through acquisitions of smaller practices (mean: 15.9 urologists) • As of 2021, 7.2% of all private practice urologists in US were employed by one of five PE-backed platforms • Over 25% of all urologists practicing in New Jersey and Maryland were employed by a PE-backed platform • Other high-concentration states include Arizona, Delaware, Pennsylvania, Ohio, Colorado, and New York
O'Donnell et al., 2020	USA	Ophthalmology practices	2010-2019	• Acquisitions of ophthalmology practices increased over the study period, with large increases in 2017 and 2018 (fewer than 10 acquisitions per year in 2010-2014, between 10-20 per year in 2015 and 2016, and approximately 30-50 per year in 2017-2019) • Acquisitions were concentrated in the Southeast, Northeast, and Western US, particularly in Florida, New York, and California

Offodile et al., 2021	USA	Hospitals	2003-2017	• 42 PE deals occurred during the study period, involving 282 hospitals in 106 of 306 unique hospital referral regions across 36 states • Activity concentrated in the Mid-Atlantic and South • 57% of acquisitions were included in the 2006 deal involving Hospital Corporation of America (HCA), Bain Capital, and Kohlberg Kravis & Roberts • PE-acquired hospitals accounted for 7.5% of all non-governmental hospitals and 11% of all non-governmental hospital discharges in 2017
Patil et al., 2022	USA	Ophthalmology, optometry practices	2012-2021	• 245 practices associated with 614 clinic locations and 948 ophthalmologists or optometrists were acquired by 30 PE-backed platform companies • Monthly acquisitions increased by 0.947 acquisitions per year from ($p<0.001$) from 2012-2021 • The greatest number of acquisitions took place in Texas, Florida, Michigan, and New Jersey
Patwardhan, Sutton, & Morciano, 2022	England	Care Homes (Nursing and Residential)	2020	• There were 649 PE-backed care homes backed by PE chains, comprising 6.0% of the total market • Most PE homes were in urban areas (n=557, 6.6%) compared with PE homes in rural areas (n=92, 4.1%)
Seiger et al., 2021	USA	Dermatology	2018-2019	• A total of 18 PE-backed dermatology management groups (DMGs) were identified • PE-backed clinic locations increased 9.8%, from 765 to 840 over the study period • 109 facilities (68%) were associated with new acquisitions, whereas 52 (32%) either part of non-publicly disclosed acquisitions or organic growth at PE-owned facilities • Number of annual acquisitions increased each year from 2012 to 2018, with 19 clinics acquired between mid-2012 to mid-2013, and 133 acquired between mid-2017 to mid-2018 • PE acquisition occurred in 35 states over the study period, with the most (19%) taking place in either Texas or Florida
Shah et al., 2023	USA	Otolaryngology	2015-2021	• 23 otolaryngology practices were acquired by 11 PE firms or PE-backed management groups across the study period, increasing each year, with 1 practice acquired in 2015, 4 practices in 2019, and 8 practices in 2021 • A majority (n=10, 43.5%) of acquired practices were in the South Atlantic region, followed by the Midwest (n=6, 26.1%), South Central (n=5, 21.7%), and Mountain (n=2, 8.7%) regions • These deals comprised 204 otolaryngologists across 132 clinical practice locations in urban and suburban areas
Singh et al., 2022[65]	USA	Physician Practices (dermatology, gastroenterology, ophthalmology)	2016-2020	• Across the study period, there were 578 practices (n=233 dermatology, n=160 gastroenterology, n=185 ophthalmology) and 1,487 physicians (n=427 dermatology, n=698 gastroenterology, n=362 ophthalmology) acquired by PE • The number of practices and physicians acquired by PE increased over the study period in gastroenterology and ophthalmology from 2016-2019
Singh et al., 2022[88]	USA	Physician Practices (dermatology, gastroenterology, ophthalmology, OB/GYN, orthopedics, urology)	2019	• In 2019, 4.9% of all physicians practicing in the included specialties were at PE practices • PE penetration was highest in dermatology (7.5%) followed by gastroenterology (7.4%), urology (6.5%), ophthalmology (5.1%), OB/GYN (4.7%), and orthopedics (1.9%) • Among 200 hospital referral regions with PE penetration, a mean of 5.6% of physicians were in PE-acquired practices • PE penetration was highest in the Northeast (6.8%), and lowest in the Midwest (3.8%) • 12 states and Washington, D.C. had an above-average share of physicians in PE practices, with the highest penetration in Washington, D.C. (18.2%), Arizona (17.5%), New Jersey (13.6%), Maryland (13.1%), Connecticut (12.6%), and Florida (10.8%)

Tan et al., 2019	USA	Dermatology practices	2012-2018	• 17 PE-backed dermatology management groups (DMGs) acquired 184 practices between 2012-2018, accounting for 381 dermatology clinics as of mid-2018, excluding organic growth • The number of acquired practices increased each year over the study period, with 5 in 2012 and 59 in 2017. • The total number of clinics owned by the 17 PE-backed DMGs was 743 as of mid-2018, with each DMG owning between 9 and 193 clinics • Acquisitions expanded geographically over the study period, involving clinics in 30 states, with 36% occurring in Texas and Florida
Vural, 2017	Turkey	Hospitals	2007-2014	• 18 private equity deals involving hospitals in Turkey from 2007-2014
Zhu et al., 2020	USA	Multiple specialties	2013-2016	• Of 18,000 unique group medical practices, 355 physician medical groups acquired by PE, with 1426 sites and 5714 physicians. A majority of acquisitions (43.9%) were in the Southern US. Acquired practices had a mean of 4.0 sites, 16.3 physicians in each practice, 6.2 physicians at each site • Most commonly represented medical groups were anesthesiology (19.4%), multispecialty (19.4%), emergency med (12.1%), family practice (11.0%), and dermatology (9.9%). From 2015-2016, also increase in number of acquired cardiology, ophthalmology, radiology, and OB/GYN practices

Supplementary Material 4. Risk of Bias Scores for Quantitative Impacts Studies[34]

1st Author Last name	Bias due to confounding	Bias in selection of participants into the study	Bias in classification of Interventions	Bias due to deviations from intended interventions	Bias due to missing data	Bias in measurement of outcomes	Bias in selection of the reported result	Overall risk of bias score
Borsa & Bruch, 2022	2	1	1	1	NI	1	1	Serious
Bos & Harrington, 2017	3	1	1	1	1	1	2	Critical
Bos et al., 2020	3	1	1	1	1	1	1	Critical
Braun et al., 2020	2	1	1	1	NI	1	1	Serious
Braun et al., 2021[39]	1	1	1	1	NI	1	1	Moderate
Braun et al., 2021[60]	1	1	1	1	NI	1	1	Moderate
Broms, Dahlström, & Nistotskaya, 2023	2	1	1	1	1	1	1	Serious
Bruch et al., 2021	2	1	1	1	NI	1	1	Serious
Bruch et al., 2022	1	1	1	1	NI	1	1	Moderate
Bruch et al., 2023	1	1	1	1	NI	1	1	Moderate
Bruch et al., 2020[42]	1	1	1	1	1	1	1	Moderate
Cerullo et al., 2021	1	1	1	1	NI	1	1	Moderate
Cerullo et al., 2022[43]	1	1	1	1	1	1	1	Moderate
Cerullo et al., 2022[44]	1	1	1	1	NI	1	1	Moderate
Creadore et al., 2021	2	1	1	1	1	1	1	Serious
Gandhi et al., 2020[22]	1	1	1	1	1	1	1	Moderate
Gandhi et al., 2020[47]	1	1	1	1	1	1	1	Moderate
Gupta et al., 2021	1	1	1	1	NI	1	1	Moderate
Harrington et al., 2012	2	1	1	1	NI	1	1	Serious

Huang & Bowblis, 2019	1	1	1	1	NI	1	1	Moderate
LaForgia et al., 2022	1	1	1	1	NI	1	1	Moderate
Liu, 2021	1	1	1	1	1	1	1	Moderate
Nie et al., 2022[66]	1	1	1	1	NI	1	1	Moderate
Nie et al., 2022[54]	2	1	1	1	NI	1	1	Serious
Offodile et al., 2021	3	1	1	1	1	1	1	Critical
Patwardhan, Sutton & Morciano, 2022	2	1	1	1	NI	1	1	Serious
Pradhan et al., 2013	1	1	1	1	NI	1	1	Moderate
Pradhan et al., 2014	1	1	1	1	NI	1	1	Moderate
Singh et al., 2022[65]	1	1	1	1	1	1	1	Moderate
Stevenson & Grabowski, 2008	1	1	1	1	NI	1	1	Moderate
Winblad et al., 2017	2	1	1	1	NI	1	1	Serious

(34) Sterne JA, Hernán MA, Reeves BC, Savović J, Berkman ND, Viswanathan M, et al. ROBINS-I: a tool for assessing risk of bias in non-randomised studies of interventions. BMJ. 2016;355:i4919

Key	
0	Low risk of bias
1	Moderate risk of bias
2	Serious risk of bias
3	Critical risk of bias
NI	No Information

Supplementary Material 5. Impacts of PE on Common Sub-Categories of Quality

Author(s) and year	Staffing	Deficiencies	Information, communication, or care plan scores	Recommendation, satisfaction, or experience Scores	Equipment	Health intervention or outcome quality	Service availability	Appointment availability	General quality scores	Patient mobility or daily functioning
Borsa & Bruch, 2022							Neutral			
Bos & Harrington, 2017	Harmful	Harmful								
Bos et al., 2020			Harmful	Harmful						
Braun et al., 2021[39]										
Braun et al., 2021[60]						Neutral				
Braun et al., 2020	Beneficial				Harmful					
Broms, Dahlström, & Nistotskaya, 2023	Harmful		Beneficial	Harmful						
Bruch et al., 2023	Harmful									
Bruch et al., 2022										
Bruch et al., 2021	Harmful			Harmful						
Bruch et al., 2020[42]						Beneficial				
Cerullo et al., 2022[43]	Harmful									
Cerullo et al., 2022[44]						Neutral				
Cerullo et al., 2021							Mixed			
Creadore et al., 2021								Beneficial		
Gandhi et al., 2020[22]	Mixed	Beneficial							Beneficial	
Gandhi et al., 2020[47]					Beneficial					
Gupta et al., 2021	Harmful	Harmful				Harmful			Harmful	Harmful
Harrington et al., 2012		Harmful								
Huang & Bowblis, 2019						Mixed				Harmful

LaForgia et al., 2022										
LaFrance et al., 2021									Harmful	
Liu, 2021			Harmful	Harmful		Beneficial	Harmful			
Nie et al., 2022[66]										
Nie et al., 2022[54]								Mixed		
Offodile et al., 2021	Harmful									
Patwardhan, Sutton, & Morciano, 2022			Harmful						Harmful	
Pradhan et al., 2014	Mixed	Harmful				Harmful				Harmful
Pradhan et al., 2013										
Singh et al., 2022[65]										
Stevenson & Grabowski, 2008	Mixed					Beneficial				Harmful
Winblad et al., 2017	Harmful		Beneficial			Beneficial				