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A Cost-Benefit Evaluation of Occupational Health Physiotherapy for Hip and Knee Osteoarthritis

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Abstract **Original Research Article**

Osteoarthritis (OA) mostly affects the hip and knee joints with symptoms including pain, stiffness, and limitations in physical functioning. Physiotherapy is the most recommended conservative treatment for hip and knee OA. The purpose of this project was to demonstrate the impact of the occupational health physiotherapy service for hip and knee OA in a 3–5-year cost forecast format recognised by finance departments. The Physiotherapy Value Calculator was used to demonstrate the economic and health impact of the occupational health physiotherapy service. This calculator uses Treasury-approved methods to show the value generated for every pound invested in physiotherapy. The cost-benefit evaluation shows that occupational health physiotherapy has significant economic benefits for hip and knee OA.

Keywords: Economic, Cost-Benefit Analysis, Occupational Health, Physiotherapy, Hip Osteoarthritis, Knee Osteoarthritis.

INTRODUCTION

Osteoarthritis (OA) is a chronic disease that mostly affects the hip and knee joints (Scheuing *et al.,* 2023). People with OA experience pain, stiffness and limitations in physical functioning (Scheuing *et al.,* 2023). OA is the most common joint disease worldwide (Katz *et al.,* 2021). In the United Kingdom (UK), approximately 18.8 million people are estimated to be living with OA and related musculoskeletal conditions (Hawker & King, 2022). OA is more prevalent in women than in men (Ackerman *et al.,* 2017). Women consistently show 30%–40% higher rates of knee OA than men (Geng *et al.,* 2023). England has the highest number of cases, but Northern Ireland has seen the fastest proportional growth in the prevalence of knee OA, increasing by 76.4% between 1990 and 2021 (Geng *et al.,* 2023). Due to the rising life expectancy and number of people with obesity, the prevalence of OA is expected to increase further over the next few decades. In the UK, OA is the primary reason for joint replacement surgery, accounting for 97% of primary knee replacements and 88% of primary hip replacements (Pavel *et al.,* 2025), which will in turn lead to an extra demand for OA-related healthcare services. People with OA are 20% less likely to be in work than those without the condition, and the cost of working days lost due to OA was estimated at £2.58 billion in 2017 and is projected to rise to £3.43 billion by 2030 (Leifer *et al.,* 2022).

Physiotherapy is the most recommended conservative treatment for people with hip and knee OA (Zampogna *et al.,* 2020). Physiotherapeutic modalities, such as aerobic exercises, muscle strengthening and education, have been shown to be effective in reducing pain and improving physical functioning (Chetty, 2010, 2011). Cost-effectiveness evaluations for OA patients in an occupational health setting are lacking. Therefore, this project aimed to evaluate the cost-benefit of managing patients presenting to the occupational health physiotherapy service with OA of the hip and knee.

METHODS

Data were collected over a period of 12-months at an occupational health physiotherapy clinic based within a National Health Service Foundation Trust in North London, United Kingdom. This Trust is one of the main healthcare providers within the North London borough of England. Staff members who are eligible can access the occupational health physiotherapy service for work-related or work-impacting musculoskeletal health conditions.

An OPAS-G2 database was utilised to identify and select patients that attended the occupational health

physiotherapy service within the data collection period for OA of the hip and knee. The Physiotherapy Value Calculator, which is an interactive online tool, was used to demonstrate the economic and health impact of the occupational health physiotherapy service. This calculator uses Treasury-approved methods to show the value generated for every pound invested in physiotherapy. The value calculator is a user-friendly version of an Excel spreadsheet populated with the return-on-investment (ROI) physiotherapy calculations (Chartered Society of Physiotherapy, 2025). For this project, it was used to calculate the ROI for the delivery of occupational health physiotherapy for hip and knee OA. The purpose of the calculator is to evidence the impact of the occupational health physiotherapy service in a 3–5-year cost forecast format that is recognised by finance departments. The calculator was used to estimate treatment costs, health system savings, wider system benefits and patient health benefits over 3 and 5 years. It also allows the user to model either a single cohort of patients or yearly cohorts and to apply or remove discounting. Using the calculator involves four quick steps, namely: (a) choose the intervention, (b) enter expected referrals per year (use an annual average rather than monthly estimates), (c) pick a modelling approach (single cohort – models one intake tracked over five year and yearly cohorts – models a new intake each year for five years), and (d) keep discounting switched on by default (this aligns with NHS business case requirements, reflecting the time value of money). The calculator produces five outputs for interpretation, namely: (a) treatment costs, (b) health system benefits (for example, reduced surgery, admissions and follow-ups), (c) wider benefits (social care, informal care and productivity), (d) patient health benefits (QALYs, expressed as monetary value), and (e) benefit–cost ratios (BCRs). This project was classified as a service improvement initiative and therefore ethical approval was not required (Health Research Authority, 2017).

RESULTS

The results of the Physiotherapy Value Calculator demonstrating the cost-benefit of occupational health physiotherapy for hip and knee OA are shown in Tables 1 and 2.

Table 1: Cost-benefit evaluation of occupational health physiotherapy for OA of the hip

Annual costs and benefits					
	Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**
Treatment cost	£26,571	£25,641	£24,743	£23,877	£23,042
Health system benefit	£77,801	£140,203	£165,549	£168,691	£160,376
Wider benefit	£16,198	£28,034	£32,611	£32,968	£31,189
Patient health benefit (QALY)	£115,056	£265,338	£381,289	£466,441	£528,447
Total benefits	**£209,055**	**£433,575**	**£579,449**	**£668,099**	**£720,012**
Cumulative annual costs and benefits					
	Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**
Treatment cost	£26,571	£52,211	£76,955	£100,832	£123,874
Health system benefit	£77,801	£218,004	£383,553	£552,243	£712,619
Wider benefit	£16,198	£44,231	£76,843	£109,810	£140,999
Patient health benefit (QALY)	£115,056	£380,395	£761,683	£1,228,125	£1,756,571
Total benefits	**£209,055**	**£642,630**	**£1,222,079**	**£1,890,178**	**£2,610,190**
Benefit-to-cost ratio					
	Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**
Health system benefit	2.9	4.2	5	5.5	5.8
Wider benefit	0.6	0.8	1	1.1	1.1
Patient health benefit (QALY)	4.3	7.3	9.9	12.2	14.2
Total benefits	**7.9**	**12.3**	**15.9**	**18.7**	**21.1**

Table 2: Cost-benefit evaluation of occupational health physiotherapy for OA of the knee

Annual costs and benefits					
	Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**
Treatment cost	£21,769	£21,007	£20,272	£19,562	£18,877
Health system benefit	£6,508	£14,725	£21,794	£27,715	£32,738
Wider benefit	£8,262	£17,252	£24,322	£29,717	£33,658
Patient health benefit (QALY)	£121,935	£275,441	£414,054	£536,637	£645,279
Total benefits	**£136,705**	**£307,419**	**£460,171**	**£594,069**	**£711,675**
Cumulative annual costs and benefits					
	Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**
Treatment cost	£21,769	£42,776	£63,047	£82,609	£101,487
Health system benefit	£6,508	£21,233	£43,028	£70,743	£103,481

Wider benefit	£8,262	£25,514	£49,837	£79,554	£113,212
Patient health benefit (QALY)	£121,935	£397,376	£811,430	£1,348,067	£1,993,346
Total benefits	**£136,705**	**£444,124**	**£904,295**	**£1,498,364**	**£2,210,039**
Benefit-to-cost ratio					
	Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**
Health system benefit	0.3	0.5	0.7	0.9	1
Wider benefit	0.4	0.6	0.8	1	1.1
Patient health benefit (QALY)	5.6	9.3	12.9	16.3	19.6
Total benefits	**6.3**	**10.4**	**14.3**	**18.1**	**21.8**

DISCUSSION

Physiotherapy for knee and hip OA involves a structured, exercise-based programme that focuses on pain management, mobility maintenance and active lifestyle promotion. Specifically, occupational health physiotherapy supports people to improve their strength, flexibility, balance and confidence to return or remain at work. Education and self-management strategies are also used to help people understand their condition and make healthy lifestyle changes to reduce their symptoms. The outcomes of effective occupational health physiotherapy include the following: helping people avoid or delay surgery, helping people manage long-term symptoms without strong medication and supporting people who want to stay active, independent and at work.

The estimated economic value of occupational health physiotherapy for hip OA over a 5-year period includes a treatment cost of £123,874, which is outweighed by the health system benefits of £712,619, wider benefit of £140,999, and patient health benefit of £1,756,571, providing a total economic benefit of £2,610,190. Furthermore, the gross benefit-cost ratio is 21.1, which implies that for every £1 invested in occupational health physiotherapy for hip OA, there is a return of investment of £21.1.

The estimated economic value of occupational health physiotherapy for knee OA over a 5-year period includes a treatment cost of £101,487, which is outweighed by the health system benefits of £103,481, wider benefit of £113,212, and patient health benefit of £1,993,346, providing a total economic benefit of £2,210,039. Furthermore, the gross benefit-cost ratio is 21.8, which implies that for every £1 invested in occupational health physiotherapy for knee OA, there is a return of investment of £21.8.

CONCLUSION

In conclusion, the cost-benefit evaluation shows that occupational health physiotherapy has significant economic benefits in the management of hip and knee OA.

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