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Research

Physiotherapy education is a good financial investment, up to a certain level of student debt: an inter-professional economic analysis

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KEY WORDS

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ABSTRACT

Questions: What is the economic value of a physiotherapy career relative to other healthcare professions? Is the graduate debt reported for physiotherapy manageable according to recommended salary-weighted debt service ratio benchmarks? **Design**: Net present value (NPV) is an economic modelling approach that compares costs and benefits of an investment such as healthcare education. An economic analysis using the NPV approach was conducted and reported in US dollars for the Doctor of Physical Therapy degree. Comparable calculations were made for a range of other healthcare qualifications. Debt service ratios were also calculated under a range of scenarios. **Outcome measures**: Entry-level salaries and rate of salary growth were obtained from government databases. Student debt levels were obtained from published sources. Because no national estimate exists for physical therapy student debt, debt was modelled for recent Doctor of Physical Therapy (DPT) graduates and for several hypothetical debt tiers. The NPV modelled future physical therapy earnings less the cost of education and the opportunity cost of foregone earnings from alternate careers. **Results**: At the debt level reported by recent graduates (US $86 563), physical therapy NPV was higher than occupational therapy, optometry, veterinary medicine, and chiropractic but lower than dentistry, pharmacy, nurse practitioner, physician assistant, and all medical specialties. At $150 000 debt, physical therapy NPV falls below all careers except veterinary medicine and chiropractic. Students with > $200 000 debt may not achieve recommended repayment benchmarks. At high debt levels (> $266 000), physical therapy NPV no longer exceeds that of a bachelor's degree. **Conclusion**: Physiotherapy education is a good financial investment, up to a certain level of student debt. Students should carefully consider the amount of debt they are willing to incur in order to pursue a physiotherapy career. Likewise, physiotherapy education programs should consider the role they may play in bolstering the economic value of their graduates' future careers. **[Shields RK, Dudley-Javoroski S (2018) Physiotherapy education is a good financial investment, up to a certain level of student debt: an inter-professional economic analysis. *Journal of Physiotherapy* XX: XX–XX]**

Introduction

To gain access to a career in healthcare, student loans are a necessity for many students (including physiotherapy students) worldwide. Surveys of students from several healthcare professions indicate that very few have the financial resources to complete graduate healthcare education without taking on student loans.[1–5] In the US, students earning professional degrees (such as one required to practise physical therapy) represent just 10% of the population of graduate degrees but comprise 42% of those with ≥ $150 000 in debt.[6] Cain and colleagues summarised the contributing causes for rising student debt, including: rising loan interest rates, schools' increased reliance on tuition to cover operating expenses, higher staffing costs, and an 'arms race' for amenities and elite facilities to enhance recruitment.[7] In parallel with this process, between 2003 and 2012, the proportion of 25-year-olds with student debt rose from 25 to 43%.[8] Student loans are now the second largest class of debt for Americans, ahead of auto loans, credit card, and home equity loans.[8]

Fortunately for most entry-level healthcare graduates, employment rates remain strong and salaries are high compared to professions in other sectors. Fields such as physiotherapy are touted as good bets for students seeking healthcare careers with abundant employment opportunities. The United States Bureau of Labor Statistics (BLS) notes that 'Employment of physical therapists is projected to grow 34 percent from 2014 to 2024, much faster than the average for all occupations'.[9] With this positive occupational outlook, conventional wisdom dictates that physiotherapy graduates will be able to repay their student loans without experiencing unreasonable financial hardship. However, other healthcare professions have recently reported that student debt negatively affects the personal and vocational choices of their newest professionals.[10–12] Between 1999 and 2011, educational debt reported by medical students grew between 1.6 and 2 times

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the rate of inflation.[13] Between 1996 and 2011, the debt:income ratio for dental students increased from 70 to 103% of annual income.[11] Debt for optometrists increased from 85 to 130% of annual income, and debt for veterinarians increased from 120 to 165% of annual income in this same period.[14] In a single 5-year span (2008 to 2012), pharmacy students' total reported debt increased by 23%.[15] These trends have triggered ongoing discussion of student debt management in these professions.[7,11,15–19] Likewise, the alarm has recently been raised about the debt burden of physiotherapy students.[20–24] However, analysis of the issue has been impeded by the lack of national estimates of physiotherapy student debt. Where such national estimates are absent, it is currently unknown whether physiotherapy students, on average, incur levels of student debt that are commensurate with the value of their future earnings.

Although there are myriad intangible reasons to become a physiotherapist, an analysis of the costs and benefits of a physiotherapy education can shed light on the economic value of a physiotherapy career. Net present value (NPV) is an approach to modelling the economic consequences of an investment such as a healthcare education, and encompasses factors such as the student's expected future wages, education cost, career duration, and foregone income from alternative careers. One recent study used this approach to model the economic value of physiotherapy education in Australia, where the ratio of education cost to physiotherapist salary is relatively low.[25] In that analysis, the NPV of physiotherapy compared favourably to one peer profession (nurse midwifery) but not to another (medicine). No previous study has modelled the economic value of physiotherapy education in the US or compared it to peer professions.

The purpose of the current study was to compare the economic value of a physiotherapy career to several other graduate-educated healthcare fields. The study examined whether graduate debt reported for healthcare professions would be 'manageable' or 'unmanageable' in light of recommended salary-weighted debt service ratio benchmarks. By better understanding the NPV of various healthcare professions, prospective students could make well-informed decisions about the amount of debt they are willing to incur to pursue a particular healthcare career. Likewise, healthcare education programs might be motivated to examine the educational debt of their graduates, to determine whether these new professionals are poised for personal and professional financial success.

Therefore, the research questions for this economic analysis were:

1. What is the economic value of a physiotherapy career relative to other healthcare professions?
2. Is the graduate debt reported for physiotherapy manageable according to recommended salary-weighted debt service ratio benchmarks?

Methods

All dollar values discussed in the text are in US dollars.

Estimating starting salary

Entry-level salaries for healthcare professions were estimated using the 25th percentile of the BLS Occupational Employment Survey national median annual wage.[26] Wage data for 2007 to 2016 were obtained for physiotherapy, chiropractic, dentistry, nurse practitioner, occupational therapy, optometry, pharmacy, physician assistants, veterinary medicine, and the seven medical subspecialties reported by the BLS. 'Nurse practitioner' has been listed as an independent discipline (occupation code 29-1171) since 2012. Nurse practitioner salaries for 2007 to 2011 were extrapolated using the linear regression for salary growth between 2012 and 2016. Entry-level anaesthesiologist and surgeon salaries exceeded the top of the BLS wage scale in most years and were blank values in the BLS database. For these professions, missing salary values were coded as the BLS maximum for that year. To determine the validity of estimating entry-level salary via the BLS 25th percentile wage, this value was compared to the entry-level physical therapist salary (0 to 3 years of experience) reported in the 2013 American Physical Therapy Association membership survey.[27]

The compound annual growth rate (CAGR) of entry-level salary for each profession was computed using the formula: (((Final salary/Starting salary)^(1/years)) − 1) × 100. The CAGR is a smoothed, annualised metric for estimating change across a defined time, which limits the influence of wage volatility that may occur in any given year. The present study compared CAGR for each profession to the compound annual inflation rate for the same time, using January-to-January inflation data from the Consumer Price Index[28] for the years in question.

Estimating student debt payments

Debt estimates for healthcare professions were obtained from data published by national educational associations,[1,2,4,5,18,29,30] in the educational literature,[31] or by educational institutions.[32] National estimates of US physical therapy student debt are not currently available via professional/academic organisations or educational literature. To model undergraduate, graduate, and total debt for physical therapists, 2016 to 2017 data from the University of Iowa Doctor of Physical Therapy (DPT) graduate survey database were used (n = 77). Total cost (tuition and fees) for the DPT degree at this institution was $61 280 for Iowa residents and $119 345 for non-residents. Cost of living in Iowa is the twelfth lowest among the 50 states of the US.[33]

Monthly and annual student loan payments were calculated using the US Department of Education federal student loan repayment estimator.[34] The interest rate for undergraduate debt was modelled using the mean of historical interest rates (2010 to 2014) for subsidised Direct Loans (3.8%).[35] The interest rate for graduate debt was modelled using the mean of historical interest rates (2014 to 2016) for unsubsidised Direct Loans (6.0%).[35] Nurse practitioner, veterinary, chiropractic and pharmacy students provided no information about undergraduate debt; for these students, it was assumed that their undergraduate debt was equal to the mean undergraduate debt reported by the other studied professions ($24 615). This value is somewhat lower than the national average undergraduate debt ($28 950),[36] but may be suitable for academically talented students who go on to study a health profession because such students would likely have received undergraduate academic scholarships.

We assumed that students did not take out Direct PLUS loans (higher-interest federal loans that do not impose a cumulative maximum loaned amount); however, students at the highest debt tiers may have incurred this form of debt. For the purposes of this report, analysis was limited to single borrowers living in Iowa with adjusted gross income equivalent to entry-level salary, less the maximum $2500 federal tax deduction per year for student loan interest. We calculated repayment scenarios for students enrolled in the two fixed repayment plans (Standard/120 month and Extended Fixed/300 month) and the Extended Graduated plan, in which payments increase over 300 months. No attempt was made to model income-contingent repayment plans, due to the impossibility of projecting salary increments in the years following entry to the profession.

Debt service ratio

A task force from The Student Debt Project and the College Board developed a set of debt service ratio benchmarks that scale according to a borrower's income, from 50 to 400% of median US income.[37] The authors proposed that higher earners have greater discretionary income (ie, funds remaining after the payment of necessities) and can therefore accommodate more student debt than people with

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