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# Attitudes towards research in graduate-entry Australian physiotherapy students: a survey

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## Abstract

**Purpose:** To assess the attitudes towards research in a two-year, graduate-entry Master of Physiotherapy course.

**Methodology:** All students starting (T0) and ending (T1) their degrees in 2020 and 2021 were invited to complete the revised Attitudes Towards Research Questionnaire. This is a three-factor instrument with 13 statements assessing Research Usefulness (four statements, scores ranging from 4 to 28), Research Anxiety (five statements, scores ranging from 5 to 35), and Positive Research Predispositions (four statements, scores ranging from 4 to 28). Each statement was scored using a seven-item Likert scale ranging from 'Strongly Agree' (1) to 'Strongly Disagree' (7). Student responses between T1 and T0 for factor scores were compared using independent samples t-tests and summarised using mean differences (95% CIs). We defined the minimally important difference as 15% of the scale range.

**Findings:** Ninety-seven percent (n=124/129) of students completed the survey at T0 and 57% (n=79/125) at T1.

We found no difference between T0 and T1 in research anxiety (0.2 points, 95% CI: -1.5 to 2.0) and research usefulness (-0.9 points, 95% CI: -1.8 to 0.1), but a significant (although not meaningful) decrease in positive research predispositions between T0 and T1 (-1.7 points, 95% CI -3.2 to -0.2).

**Research implications:** Qualitative research could complement these quantitative findings and provide in-depth reasons for student scores.

**Practical implications:** Educators need more active strategies to improve attitudes and engagement in research-focused subjects to further engage students.

**Originality/value:** This is the first study to document attitudes towards research in an Australian graduate-entry Master of Physiotherapy program.

**Limitations:** There is likely bias (unclear in which direction) at T1 given that 57% of students completed the survey. Surveys were not linked, so group differences were assessed independently.

**Keywords:** Evidence-based practice; research methods; Master of Physiotherapy, UTS Physiotherapy Student surveys (PHYSS) study

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## BACKGROUND

Research skills are taught in many health-related degrees with the hope that graduates will be able to find, appraise, and apply research when practicing clinically (Riiser et al. 2023). Students need to have positive attitudes towards research so that up-to-date research is incorporated into clinical practice (Helgøy et al. 2020). Students in health science degrees sometimes struggle to transfer research education to clinical practice (Olsen et al. 2013). During clinical placements, there is a prioritisation of practice-based knowledge, rather than research or evidence-based knowledge, with students reporting that some educators believe that students don't have the 'time or energy to focus on EBP [evidence-based practice]' (Olsen et al. 2013, p. 10). Some students are stressed and anxious when beginning research subjects (Papanastasiou & Zembylas 2008) and some students struggle with performing research projects and the quantity and difficulty of the material (Wilson & Onwuegbuzie 2001; Yousefi-Nooraie et al. 2007). Anxiety towards research, along with the high perceived time commitment is a barrier to learning and acquiring research skills (Kakupa & Xue 2019) and may affect future research behaviours (Papanastasiou & Zembylas 2008). Therefore, it is important that students have positive attitudes towards research.

The revised Attitudes Towards Research Questionnaire (rATRQ) is a 13-item questionnaire that assesses student attitudes towards research subjects. It includes the factors *Research Usefulness* (four items), *Anxiety Towards Research Courses* (five items) and *Positive Research Predispositions* (four items). A three-factor structure has been confirmed in the redevelopment of the scale (Papanastasiou, 2014).

Numerous studies have investigated attitudes towards research, including in physiotherapy students (Mazher et al. 2022; Sanjaykumar & Shah 2022), education students (Akour et al. 2023; Papanastasiou 2014), architecture students (Jansen et al. 2022) and research-intensive (Masters and PhD) students (Kakupa & Xue, 2019). Undergraduate students have poorer attitudes towards research than postgraduate coursework students (Mazher et al. 2022) and students in research-intensive degrees (Kakupa & Xue 2019). Although numerous studies have collected student attitudes towards research at one time point in a degree, none have assessed student attitudes at the start and at the end of a health sciences degree. It is important to assess research attitudes on more than one occasion, as this may change throughout the degree. Measuring students at the entry and exit timepoints to the degree provides a measure of whether attitudes differ as a result of the degree. It also provides information on student attitudes as they enter the workforce as physiotherapists.

As universities have a pivotal role in ensuring students have positive attitudes towards research, a first step in optimising the delivery of research subjects is to understand student attitude towards research and assess if this differs between the start and end of the degree. The purpose of this study was to assess student perceptions of research using the rATRQ at the start and end of the degree and assess differences between the timepoints.

## METHODS

### DESIGN

An anonymous survey was taken at two timepoints including all students starting their degree in 2020 and 2021 (T0) and ending their degree in 2020 and 2021 (T1). The study was approved by the University of Technology Sydney Human Research Ethics Committee (ETH19-4542).

### CONTEXT

The Master of Physiotherapy course at the University of Technology Sydney is a two-year graduate-entry Masters-by-coursework degree. Students complete four 10-to-14-week semesters and four five-week clinical placements in a range of physiotherapy areas. All subjects are research-informed and have a significant research aspect embedded into subject content and delivery. In addition, students have one five-week introductory research-specific module in Semester 1 (embedded within a Professional Practice subject) as well as research-focused subjects in Semester 3 (6 credit points) and Semester 4 (6 credit points). In Semesters 3 and 4, as part of the research-focused subjects, students complete a research project, in groups of four-to-six students, under the supervision of an academic, with the goal of publishing a manuscript on completion. Students also receive one lecture and one tutorial per week over a 12-week (Semester 3) and a 10-week (Semester 4) semester, as well as meeting with their research project supervisor and conducting their research. Throughout Semesters 3 and 4, students have assessments related to the research process. Lectures focus on topics such as research design (randomised controlled trials, systematic reviews, prognostic, diagnostic and qualitative research), the strength of the evidence using various designs, quality appraisal tools for studies of different designs, and statistics. Tutorials focus on providing guidance for the group research project and applying some of the methodologies used in the lectures.

### PARTICIPANTS

All students at T0 (n=129) and all students at T1 (n=125) were invited to participate in the anonymous surveys. The surveys at T0 were performed in orientation week, the week prior to the start of Semester 1. The surveys at T1 were performed in the last tutorial in the final week of the degree. Participation was voluntary and all participants provided written informed consent. Students were provided a web link and QR code to complete the survey. The data reported in this study are a subset of the questionnaires used from the UTS Physiotherapy Student Surveys (PHYSS) study. The PHYSS-study is a 20-minute questionnaire about pain, pain beliefs and confidence in interacting with patients, as well as attitudes towards research (Pate et al. 2023; Stubbs & Verhagen 2023). This manuscript only reports data on the rATRQ.

### DEMOGRAPHIC VARIABLES

Reported demographic data include gender, age (using ranges) and graduation year.

## REVISED ATTITUDES TOWARDS RESEARCH QUESTIONNAIRE (rATRQ)

The rATRQ measures student attitudes towards research (Papanastasiou 2014). It is a 13-item questionnaire with Likert response scales that assesses attitudes towards research methods. For each item, attitudes to each statement were allocated integers from 1–7 corresponding to answers of Strongly Disagree (1), Disagree (2), Somewhat Disagree (3), Neither Agree nor Disagree (4), Somewhat Agree (5), Agree (6) and Strongly Agree (7). Scores for the factor *Anxiety Towards Research Courses* were reverse coded (i.e. Strongly Agree = 1 and Strongly Disagree = 7). The rATRQ is a revision of the original 32 item (five factor) questionnaire (Papanastasiou 2005) to the current questionnaire (13 items, three factors) following a confirmatory factor analysis (Papanastasiou 2014) with the factors *Research Usefulness* (four items,  $\alpha=0.92$ ), *Anxiety Towards Research Courses* (five items,  $\alpha=0.86$ ), and *Positive Research Predispositions* (four items,  $\alpha=0.92$ ). Each factor shows discriminant validity against the other factors ( $r=0.18$  to  $r=0.54$ ). To date, no study has reported responsiveness, minimal detectable change, or minimally important difference (MID). As such, we have determined the MID as 15% of the scale range. This means the MID for the four item factors (*Research Usefulness* and *Positive Research Predispositions*) is 3.6 points and for the five-item factor (*Anxiety Towards Research Courses*) is 4.5 points.

## DATA ANALYSIS AND STATISTICS

A complete case analysis was performed. Demographic information and items scores at T0 and T1 were summarised using descriptive statistics. As data were parametric, independent sample t-tests were performed on factor scores between T0 and T1. Data were analysed using SPSS (version 27) and excel (version 2016).

## RESULTS

The students that completed the surveys (percentage of total students) was  $n=124$  (97%) at T0 and  $n=79$  (57%) at T1. Sixty-two percent of respondents were female at T0, and 61% were female at T1. Most respondents were in the age group of 19–24 years at T0 and 22–27 years at T1 (Table 1).

**Table 1: Demographic information of students that completed the surveys**

Characteristics and demographic information	T0 n = 124 (%)	T1 n = 79 (%)
Graduation year		
2020	-	33 (42%)
2021	62 (50%)	46 (58%)
2022	62 (50%)	-
Gender		
Female	77 (62%)	48 (61%)
Male	48 (38%)	30 (38%)
Gender Fluid	0	1 (1%)
Non-binary	0	0
Age (years)		
19–21	46 (37%)	0
22–24	63 (51%)	54 (68%)
25–27	11 (9%)	20 (25%)
28+	4 (3%)	5 (6%)

The mean (SD) scores for each factor at T0 and T1 are presented in Table 2. We found no differences between T0 and T1 for the factors *Research Usefulness* and *Anxiety Towards Research Courses* (Table 2). The difference between T0 and T1 for the factor *Positive Research Predispositions* was statistically significant but did not reach our MID (Table 2). Mean item rATRQ scores were  $6.3 \pm 0.6$  (T0),  $6.1 \pm 0.9$  (T1) for *Research Usefulness*,  $3.3 \pm 1.2$  (T0) and  $3.4 \pm 1.3$  (T1) for *Anxiety Towards Research Courses* and  $4.3 \pm 1.1$  (T0) and  $3.9 \pm 1.4$  (T1) for *Positive Research Predispositions*.

**Table 2: Mean (SD) of total rATRQ scores and factor scores at T0 and T1**

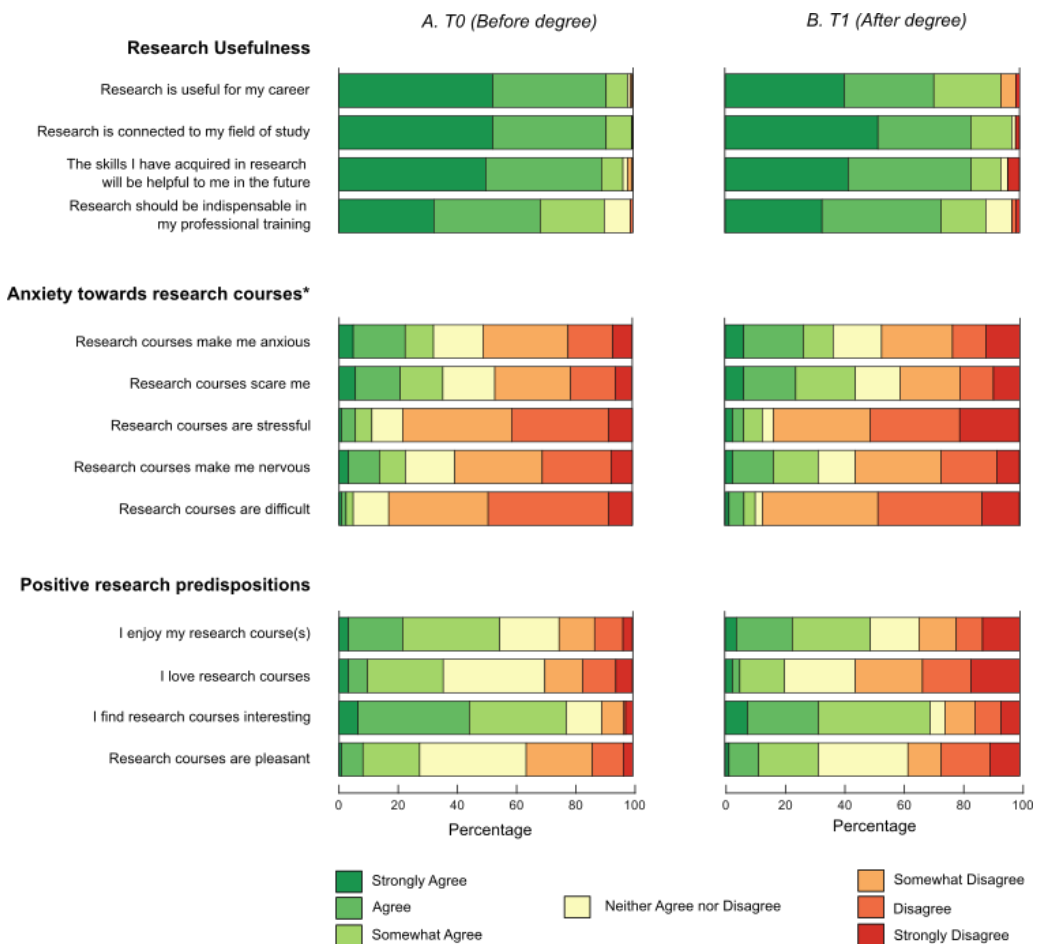
Factor	T0 mean $\pm$ SD	T1 mean $\pm$ SD	Mean difference (95% CI's)
Research Usefulness	25.1 $\pm$ 2.5	24.2 $\pm$ 3.7	-0.9 (-1.8 to 0.1)
Anxiety Towards Research Courses	16.7 $\pm$ 5.8	16.9 $\pm$ 6.5	0.2 (-1.5 to 2.0)
Positive Research Predispositions	17.3 $\pm$ 4.5	15.6 $\pm$ 6.7	-1.7 (-3.2 to -0.2)*
Total scores	59.1 $\pm$ 10.1	56.8 $\pm$ 11.5	-

\*Factors with 95% Confidence Intervals that do not include zero.

The percentage of 'Strongly Agree' to 'Strongly Disagree' responses for each item for T0 and T1 are shown in Figure 1.

**Figure 1: Itemised rATRQ responses for students completing the survey at T0 (left side) and T1 (right side)**

The factors associated with each item below are bolded. Response categories were ‘Strongly Agree’ (dark green), ‘Agree’ (green), ‘Somewhat Agree’ (light green), ‘Neither Agree nor Disagree’ (yellow), ‘Somewhat Disagree’ (light orange), ‘Disagree’ (orange) and ‘Strongly Disagree’ (red). Items for the factor ‘Anxiety Towards Research Courses’ are reverse coded.



## DISCUSSION

On entry to the course, most students believed that research was useful for their career, and this remained stable at the end of the degree. Students had moderately positive research predispositions, which decreased over the degree. Students were anxious about research courses, and this factor did not change between the start and end of the degree. We found no difference in scores between T0 and T1 in *Anxiety Towards Research Courses* and *Research Usefulness* with narrow 95% confidence intervals not crossing the meaningful difference. There was a decrease in *Positive Research Predispositions* between T0 to T1 which was statistically significant, but not meaningful. Overall, there was little difference in research attitudes at T0 and T1.

## RESEARCH USEFULNESS

Our students rated research as more useful (24.2 at T1 and 25.1 at T0) than students in previous studies (Akour et al. 2023; Jansen et al. 2022; Mazher et al. 2022; Papanastasiou 2014; Sanjaykumar & Shah 2022). Three previous studies have mean factor scores of 19.9 (Papanastasiou 2014), 20.4 (Jansen et al. 2022) and 19.2 (Akour et al. 2023) which exceed our MID of 3.6. Two studies have higher mean factor scores of 21.2 and 22.1 (Mazher et al. 2022; Sanjaykumar & Shah 2022). The lower scoring studies were in undergraduate student populations in the areas of education (Akour et al. 2023), architecture (Jansen et al. 2022) and educational research (Papanastasiou 2014). Both higher scoring studies surveyed physiotherapy students who were either postgraduate (Sanjaykumar & Shah 2022) or undergraduate and postgraduate (Mazher et al. 2022). Mazher et al. (2022) compared undergraduate students to postgraduate students and found significantly higher scores for postgraduate students (21.9 vs 20.5), which may or may not be meaningful, indicating that stage of study (undergraduate compared to Masters) may have a small effect on perceived research usefulness.

Reasons for our high scores at T0 and T1 could be the very competitive requirements for course entry at this university. This includes successful completion of a health/science related undergraduate degree, a high GPA requirement, six prerequisites (including a research subject) and good performance in a semi-structured interview prior to an offer to the course. In addition, the financial cost of the course (~\$80,000 AUD) means that students are often highly motivated. In addition, our course is Level 9 in the Australian Qualifications Framework and students can directly apply for a PhD on completion. Another study that surveyed Masters-by-research and PhD students also found high (25.0) research usefulness scores, which suggests that our students may perceive research usefulness similarly to higher-degree-research students (Kakupa & Xue 2019). In our population, there is possibly a ceiling effect from T0 to T1 that limits an increase in scores, with ≈90% of students scoring 'Agree' or 'Strongly Agree' for three items (Pate et al. 2023) and 68% scoring 'Agree' or 'Strongly Agree' in the other item. Given this, future research could qualify this factor within the survey, assess the factor using different surveys (Baloğlu 2002; Melnyk et al. 2008) or assess the factor in another way, such as using qualitative research.



## ANXIETY TOWARDS RESEARCH COURSES

Our students had high anxiety towards research at T0 (16.7) which remained high at T1 (16.9). A previous study has also found high anxiety towards research courses in undergraduate and postgraduate students, with a score of 15.9 (Mazher et al. 2022), and postgraduate physiotherapy students having more anxiety than undergraduate students. Other studies show much lower anxiety about research, with scores of 22.4 (Sanjaykumar & Shah 2022), 23.3 (Akour et al. 2023) and 22.8 (Jansen et al. 2022). Due to the lack of entry requirements and course-related details provided by other studies, it is difficult to ascertain why there is such a wide disparity between studies. For our students, it is possible that the responses may be due to the high statistics component within the prerequisite research courses and the requirement for statistics as part of our research subjects, as students are often very anxious about statistics (Onwuegbuzie and Wilson, 2003; Pan and Tang, 2004). Our scores may also reflect how the research subjects are positioned in the course, with a research project that must be completed in a group over 35 weeks with only 22 weeks of scheduled classes between multiple placements. Students often struggle when performing research projects, especially when the difficulty and quantity of material is high (Wilson & Onwuegbuzie 2001; Yousefi-Nooraie et al. 2007). The high anxiety is concerning from a student well-being perspective, and we will need to further investigate the reasons for the high anxiety experienced. Further investigations could be performed using qualitative research methods (focus groups or interviews) and may potentially inform interventions to reduce anxiety.

## POSITIVE RESEARCH PREDISPOSITIONS

Students had less positive research predispositions at T0 (17.3) than at T1 (15.6) however the 95% confidence interval and the minimal important difference (3.6) suggest the difference is not meaningful. Other courses had similar scores of 14.8 (Papanastasiou 2014), 15.2 (Jansen et al. 2022), 17.44 (Akour et al. 2023) and 18.4 (Mazher et al. 2022), with only one study (Sanjaykumar & Shah 2022) showing highly positive research predispositions (21.1). Although our scores are similar to most other courses, a more positive inclination towards research may encourage the use of research in clinical practice (Olsen et al. 2013). This could be attained by restructuring the delivery of topics so that certain topics are avoided as introductory content (such as statistics, diagnosis and prognosis) with this more advanced content being provided later in the degree (Yousefi-Nooraie et al. 2007). Providing research content so that advanced content is scaffolded with introductory content provides an easy progression for students through the degree; however, it may not make material more interesting. In our course, students also perform a research project concurrently with research courses. As such, our scores likely come from a combination of the content taught in the research classes and the research project that is performed. Currently, research topics are chosen by academics (with students choosing a topic within a range of academic-selected topics). Allowing students to choose their own research topic would likely increase their interest in the topic. Although this would improve student engagement, projects would require oversight from an academic, who may not have content knowledge in the area. Other strategies to improve student engagement could be journal clubs (Helgøy et al. 2022) (as marked or unmarked assessments), with academics providing external exemplars, such as the Physiotherapy Evidence Database (PEDro) World-Wide Journal Club (2020). These exemplars could be helpful to students (Carless et al. 2018) and

signpost resources that could be used after their degree (Boud and Falchikov 2006). We will be able to measure the success or failure of strategies employed to improve attitudes to research through the rATRQ.

## LIMITATIONS

There is limited information on the psychometric properties of the rATRQ, including test-retest reliability, the smallest detectable change, minimally important change, and responsiveness. This means that interpretation of the magnitude of difference in responses from T0 to T1 requires caution. The low number of respondents at T1 (57%) compared to T0 (97%) could indicate both more positive and more negative reported attitudes towards research at T1. Students who disliked the subjects may be more likely to respond in order to voice their dissatisfaction, or less likely to respond as they do not want to engage in a research-related questionnaire.

One weakness of the study methodology was that it used an unlinked survey at T0 and T1, with a partially overlapping population. A stronger design would survey students at both timepoints with linked responses. This would enable us to determine if there are factors, items or predictors at T0 that may be associated with attitudes about research at T1. Unfortunately, this was not possible with the ethical approval we had received at the time of the study.

The survey at T0 was completed in orientation week prior to the degree. Although the surveys are anonymous, students may have been unrealistically optimistic at T0 as they were looking forward to the course and had just completed a break from their previous degree. Students may be more pessimistic at T1, as they are tired from the course, are possibly uncertain about future employment opportunities and are excited to be practicing clinicians and not researchers.

## FUTURE DIRECTIONS

Student attitudes may not necessarily relate to student abilities in research. Regardless of their attitude towards research, they may be very competent (and use research in practice) or very incompetent (and not use research in practice). Student attitudes would need to be verified by surveys or interviews when they are in clinical practice, after graduation. The rATRQ provides an indication of the responses using a 7-point Likert scale. Although it can provide an indication of areas of improvement, it is limited in scope and does not provide an indication of the complexity of learning research from a student perspective, or teaching research from an academic's perspective. Performing qualitative semi-structured interviews or using focus groups of academics, students and other stakeholders could enhance the data provided here and allow a deeper understanding of issues encountered. For this, we intend to implement a co-design element where students, academics, patients and other stakeholders contribute as partners in curriculum development (Healey et al. 2016). As occurs with using (for example) a students-as-partners approach, this co-design element will provide students with ownership of the research subjects and allow the subjects to clearly align with their needs and requirements, in consultation with academics (Healey et al. 2016). This may also assist in reducing student anxiety and increasing positive predispositions.

The current study provides information about student attitudes before and after the degree. As such, we can make changes to our courses to enable students to be

more engaged. We can assess the effectiveness of the changes using the rATRQ or other questionnaires such as the Statistics Anxiety Rating Scale (Baloglu 2002) and the Evidence Based Practice Beliefs and Implementation scale(s) (Melnyk et al. 2008). This could provide an indication that the implemented changes improve student attitudes.

## CONCLUSION

Our students believed research was useful, had moderately positive research predispositions, which decreased over the degree, and were anxious about research courses. There was no difference in *Anxiety Towards Research Courses* and *Research Usefulness* between T0 and T1. There was a significant decrease in *Positive Research Predispositions* from T0 to T1 that was not meaningful. Our students had similar research predispositions to those in other courses.

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## Declaration of Interest statement

We report no competing interests.

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