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RESEARCH REPORT

Confirmatory factor analysis of the Study Process Questionnaire in an Australian osteopathy student population

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Abstract Evaluation of student learning strategies can be a useful way of measuring the impact of educational interventions, and provide information to educators about how best to engage students during their teaching. The Study Process Questionnaire has been widely used to evaluate student learning strategies. Students in the 2014 and 2015 year 1 cohorts of the osteopathy program at Victoria University completed the revised Study Process Questionnaire (R-SPQ-2F) as part of a larger study investigating the assessment and evaluation practices in the program. Confirmatory factor analysis was used to determine the fit of the data to the 2 factor structure of the R-SPQ-2F. Satisfactory fit was achieved through the removal of one item and the internal consistency was acceptable. This study proposes a version of the R-SPQ-2F that could be used in an Australian osteopathy student population.

Implications for practice

- Evaluation of learning strategies can provide osteopathic educators with valuable information about their learners.
- This study proposes a modified version of the R-SPQ-2F excluding one item that could be

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used in an Australian osteopathy student population.
- Osteopathic educators are encouraged to explore the use of the R-SPQ-2F in their own program to ascertain if the modified version is appropriate for their context.

Introduction

The learning strategies used by students in higher education have received substantial coverage in the literature. These learning strategies are then used to identify educational methods that may assist learners. Biggs[1] has suggested that students can broadly be classed as deep or surface learners. Deep learners are thought to engage with the subject content, reflecting on it and synthesise new with previous knowledge to develop their understanding. Surface learners on the other hand, employ strategies that allow them to retain enough information for the period of an assessment or learning activity (rote learning), but do not synthesise this with other knowledge. That said, there are examples of students employing both strategies to positive effect, particularly in clinical education.[2–4] Further, teaching style has been shown to impact on learning approach[5,6]: teachers using primarily knowledge transmission approaches encourage surface learning; teachers using student-centred/knowledge synthesis approaches encourage deep learning.

Self-report questionnaires have been used to classify students' use of either a deep or surface approach to learning. These include the Approaches and Study Skills Inventory,[7] the Approaches to Learning at Work,[8] and the widely used Study Process Questionnaire (SPQ).[1] The SPQ was developed by Biggs et al.[1] as a way evaluating student learning strategies, and using this information as part of a quality assurance program, identify students who may need assistance, and to evaluate innovations in teaching and assessment.[9] By way of example of evaluating teaching and assessment changes, Bevan et al.[10] demonstrated that traditional lectures/examinations encouraged surface learning, whilst student-centered workshops/multiple examinations throughout a biochemistry subject encouraged deep learning. With regard to the health professions, there are numerous examples[3,11–16] where the SPQ and it's more recent incarnation, the revised 2 factor version of the SPQ (R-SPQ-2F),[9] have been used. Interested readers are encouraged to explore the summary of learning approaches in the context of health professions education by Newble and Entwistle.[17] The purpose of the current study was to present evidence for the validity argument for the ongoing use of the R-SPQ-2F in an Australian osteopathic student population.

Method

This study was approved by the Victoria University Human Research Ethics Committee.

Participants

Students enrolled in the 2014 and 2015 cohorts for year 1 of the Bachelor of Science degree in the osteopathy program at Victoria University (VU) (Melbourne, Australia) were invited to participate in a larger project evaluating the teaching, learning and assessment practices. Students were invited to complete a number of questionnaires in week 1 of the 1st teaching semester as part of their first practical skills class. Responses were anonymous and questionnaires completed on paper.

Measure

Participants completed the R-SPQ-2F and two demographic questions (age & gender). The R-SPQ-2F was developed by Biggs et al.[9] based on the original version of the SPQ, and consists of 20 items spread across 2 first order factors (deep, surface) and 4 s order factors (deep motive, deep strategy, surface motive, surface strategy). Each item is rated on a five-point Likert scale (1 = Never or only rarely true for me to 5 = Always or almost always true for me). Total scores were calculated for each first order factor. These authors[9] have reported confirmatory factor analysis (CFA) statistics supporting the factor structure of the R-SPQ-2F, however the internal consistency statistics (Cronbach's alpha) for all but the surface motive subscale are below 0.70. Other authors have demonstrated higher alpha scores (>0.80) for the deep and surface factors.[18–20]

Data analysis

Data were entered into Microsoft Excel. The *R* program[21] was used to perform the analyses. Descriptive statistics were generated, and internal consistency calculated using ordinal alpha,[22] both