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Undergraduate nurse variables that predict academic achievement and clinical competence in nursing

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A hypothetical model was formulated to explore factors that influenced academic and clinical achievement for undergraduate nursing students. Sixteen latent variables were considered including the students' background, gender, type of first language, age, their previous successes with their undergraduate nursing studies and status given for previous studies. The academic and clinical achievement of 179 undergraduate nursing students were estimated by measuring their performance using two separate assessment parameters, their completing grade point average scores and outcomes of their final clinical assessment. Models identifying pathways leading to academic and clinical achievement were tested using Partial Least Square Path Analysis (PLSPATH). The study's results suggest that undergraduate nursing student achievement can be predicted by four variables, which account for 72 per cent of the variance of scores that assess academic and clinical performance at the completion of the third year level of nursing studies. The most significant predictors and those that had direct influence on undergraduate nursing student achievement were: (a) grades achieved in topics undertaken at the beginning of their last year of study and (b) those achieved just prior to course completion (c) where the undergraduate nursing students had undertaken their final allocation for clinical experience, and (d) students' self rated need for clinical supervision at course completion. Measures of performance according the grade point average scores, student gender, age and type of first language used were not directly related to the performance outcomes.

Partial least squares path analysis, undergraduate nurses, predictor variables, achievement

BACKGROUND TO THE STUDY

Currently in Australia (and worldwide) there is a shortage of qualified nurses in the health care workforce. As a consequence of this, there had been several significant government enquiries into issues associated with the recruitment and retention of nurses. These enquiries have also sought to understand the relationship between educational processes and preparation of student nurses for their eventual role in the nursing workforce. It could be reasonably argued that the effort and resources, that are employed to recruit nursing students, has little value when the educative resources and curricula may not be preparing graduates for academic success. What is required is a mechanism to predict academic success for nursing students during the course of their studies (Hass, Nugent and Rule, 2004). In this way, educational resources can be honed to meet best the needs of the students and the profession/workforce.

In a bid to attract more nurses into the profession there are multiple pathways into the undergraduate nursing degree, including recognition for prior learning, mature entry pathways, and recruiting graduates from other disciplines.

Not all pathways have a consistent entrance requirement and this confounds any attempt to predict academic and clinical achievement (Campbell and Dickson, 1996) particularly when nursing students arise from quite diverse backgrounds. It was perceived by the authors that not enough was known about how these different pathways would impact on nurse academic and clinical achievement.

A search of the literature revealed that this concern of predicting Australian student achievement was not confined just to nursing and much literature had examined the predictors for medical achievement and this information has served to inform this article.

Studies suggested that different psychological tests had been used to predict academic and clinical achievement. Blackman and Darmawan (2004) in their study that examined criteria used to predict achievement for medical students, explored the use of psychological assessment as a factor associated with of student success in graduating from medical schools, but these had proved to be unreliable particularly when such variables as the student's personality, interest and attitudes (Aldrich, 1987) were considered. Other studies cited by Blackman et al. (2004) suggested that useful predictors for medical student success in the academic aspects of their studies included their achievement at high school and their past grade point average scores (Green, Peters and Webster, 1993; Hoschl and Kozeny, 1997; Shen and Comrey, 1997).

A large proportion of mature-aged students are entering the undergraduate nursing degree in response to the shortage of nurses and the career pathway that is offered for advancement for enrolled nurses and non-licensed personal carers. Previous studies provide conflicting evidence as to how age impacts on nurse achievement. Byrd et al. (1999) found that in baccalaureate and diploma courses, older students were doing better in those courses than younger students. This stance is disputed, with other literature suggesting that older students often take longer to adapt and learn new nursing skills. This parallels the findings of the variable of age and its impact on medical student achievement (Aldous, Leeder, Price, Sefton and Tuebner, 1999; Huff and Fang, 1999; Kay, Pearson and Rolfe, 2002).

Historically, nursing has been a female dominated profession with only about 12 percent of the nursing profession being composed of men. Conversely, medicine has historically been a male dominated profession with women making a minority, and it has been argued that student gender influences achievement. According to Blackman et al. (2004) achievement in the clinical assessments in medicine and in particular using the OSCE assessment format, female students achieve at a level significantly higher than males in certain specific medical skills assessments. It is argued that male and female students do in fact learn differently from each other and this can therefore also influences achievement outcomes (Chaput de Saintonge and Dunn, 2001). Conversely, according to Harden, Towers, Berkeley and Dunn (1998), female nursing students did significantly better than male nursing students irrespective of which nursing subjects were taken. This position is also confirmed by studies by Hass et al. (2004) who suggest that higher female student achievement could in fact be due to non-academic factors, such as the level of students' self esteem, and economic factors that impact on the student.

Since nursing students came to the undergraduate nursing degree from multiple pathways, it would appear from the studies by Wall, Miller and Widerquest (1993), Waterhouse, Carroll and Beeman (1993) and Byrd, Garaz and Niesweamody (1998) that undergraduate grade point average scores (GPA) were the most significant predictors of achievement in nursing. Where these authors differed with respect to GPA scores being a predictor for achievement was with respect to the timing of when GPA scores were able to predict best a final measure of achievement. Waterhouse et al. (1993) reported that all year GPA scores were useful predictors for final achievement, while many other authors did not support this finding, Glick, Mc Clelland, and Yang, (1986), Jenks, Selekman, Bross, and Paquet (1989), Arathuzik, and Aber, (1998), Enders, (1997), Gallagher, Bomba, Crane, (2001), and Stark, Feikema, and Wyngarden, (2002).

Similarly, GPA scores were not reliable predictors of success in the early years of undergraduate medical studies (Blue, Gilbert, Elam and Basco, 2000) either, and when used on their own, GPA scores were poor predictors for medical course achievement especially for students who came from cultural minority groups (Lynch and Woode, 1990), or for students who used English as a second language (Chan-Ob and Boonyanaruthee, 1999), or predicting students' ability to interact with patients, or in estimating their efficacy with clinically related skills (Hall and Stocks, 1995; Poussaint, 1999; Reede, 1999).

The Australian Nursing Council Inc (ANCI) has as its charter, to ensure that nurses have initial and continuing competence to practice as a nurse (Australian Nursing Council, 2002). It does this by advising educational providers to nursing, of the national competences that are expected and consistent with safe practice. There are many core competencies that are attributed to safe nursing practice that student nurses must meet by the end of their academic studies. To achieve this goal, the ANC recommend that (a) number of diverse assessments methodologies are employed to measure candidate competence, including student self-assessment; and (b) assessment of performance by a registered nurse.

METHODS OF INVESTIGATION AND ANALYSIS

Figure 1 gives in diagrammatic form a hypothesised path model for predicting nursing student achievement and clinical competence. The outer model is composed of the topics undertaken by nursing students, for each semester (eg: NURS1404) of their three-year degree program and the elements of competency assessment' that nurses are required to undertake (eg: ANC 14) to be deemed as proficient. These manifest variables are displayed in Figure 1 as small rectangular boxes. The latent variables are shown (in oval-shaped figures in Figure1) with the directions of hypothesised causal influence impacting on undergraduate nurse achievement, being shown by the path arrows. A full explanation of all topics undertaken and areas of nursing competence (ANC) is displayed in the two tables that follow.

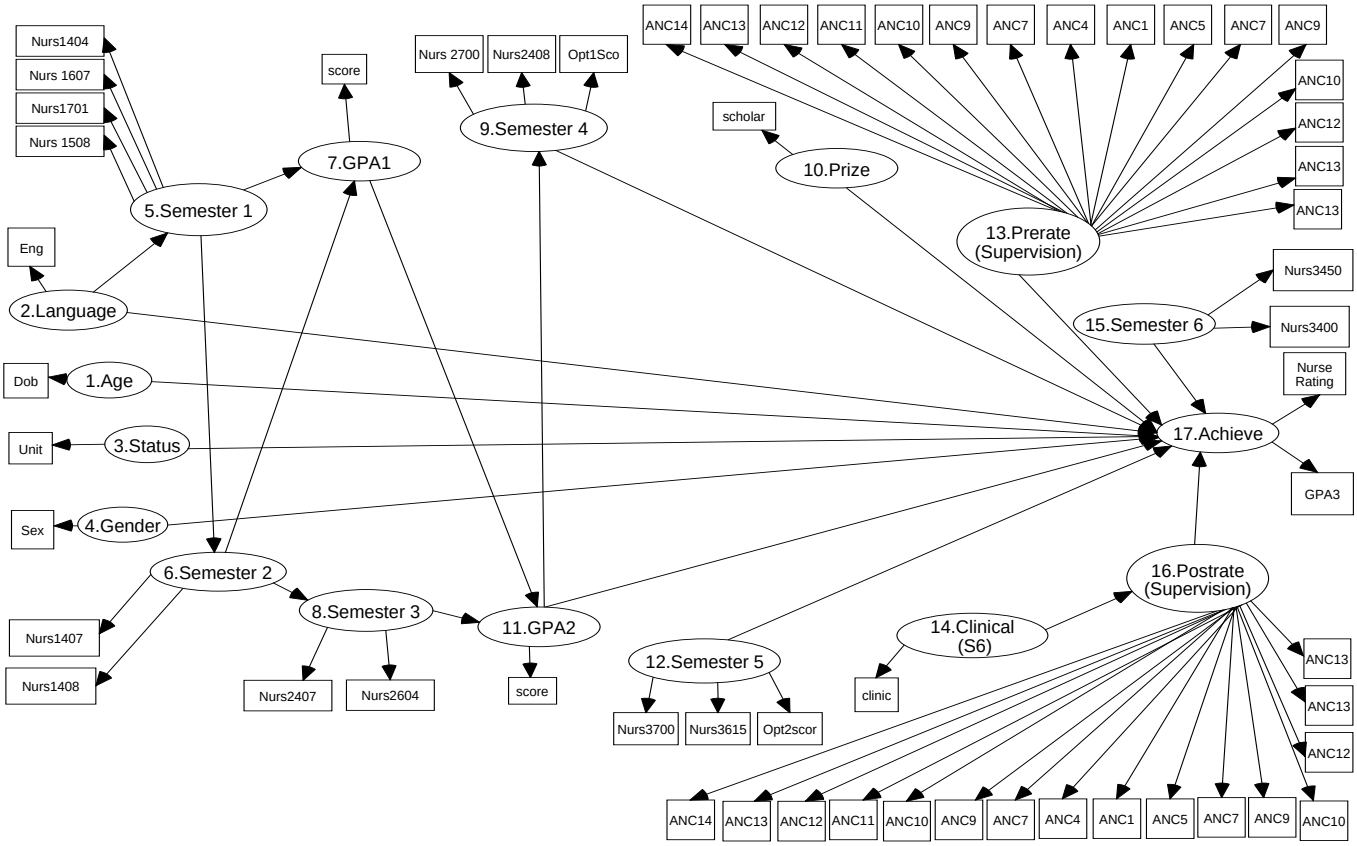

Figure 1: Predicted relationships between manifest and latent variables to undergraduate academic achievement and clinical competence in nursing

Table 1 introduces variables that are not defined by other variables and that can therefore be measured directly. It can be noted that the first four variables are essentially student demographic variables (eg: student age).

Table 1: Descriptors of Variables

Variables	Description of the latent variables
1. Age	Age of the student in years
2. Language	The first language type used by the student
3. Status	Recognition of prior learning translated to number of units credited towards the nursing degree (4.5-72 units)
4. Gender	Sex of the student
7. GPA 1	Grade point average for all nursing studies completed in Year 1
10. Awards	The number of university prizes or awards achieved for academic and clinical performance
11. GPA 2	Grade point average for nursing studies completed in Year 2

Several of the variables were not directly observable, are hence are termed latent variables, necessitate the use of manifest variables to observe and measure the latent variables that lead on to student nurse achievement. These are listed on Table 2.

Table 2: Descriptors of the manifest variables that define latent variables

Latent variable	Descriptions of manifest variables
5. Student scores for Semester 1 topics	Topic nurs 1508: Research topic Topic nurs 1701: Communication skills Topic nurs 1607: Applied physical science Topic nurs 1404: Introduction to nursing
6. Student scores for Semester 2 topics	Topic nurs 1407: Anatomy, physiology and health assessment Topic nurs1408: Activities of daily living and introduction to social sciences
8. Student scores for Semester 3 topics	Topic nurs 2407: Nursing theory and practice Topic nurs 2604: Pathophysiology
9. Student scores for Semester 4 topics	Topic nurs 2700: Psychological responses to illness Topic nurs 2408: Nursing theory and practice Option 1 topic: Nursing practice focused elective
12. Student scores for Semester 5 topics	Topic nurs 3700: Sociopolitical aspects of health Topic nurs 3615: Nursing theory and practice Option 2 topic: Nursing practice focused elective
13. Self-rated student scores for level of clinical supervision needed for them to demonstrate competence prior to last clinical placement and	ANC 14: Competence with collaboration skills ANC 13a: Competence with delegation skills ANC12a: Competence with documentation skills ANC 11: Competence to ensure patient safety ANC 10: Competence with care evaluation skills ANC 9: Competence in providing comprehensive care
16. Self rated scores produced at the completion of the students' final clinical placement	ANC 7a: Competence to assess needs methodically ANC 4: Competence to show accountability for care ANC 1: Competence to practice as informed by law ANC 5: Competence to engage with professional development ANC 7b: Competence for individual's health assessment ANC 9: Competence to educate about health promotion ANC10: Competence to determine patient progress ANC 12b: Competence in communication effectiveness ANC 13b: Competence to organise workload ANC 13c: Competence to respond to rapid clinical changes
14. Type of last clinical placement	Public or private clinical venue
15. Student scores for Semester 6 topics	Topic nurs 3450: Professional development topic Topic nurs 3400: Final clinical topic
17. Final achievement variable	GPA scores for the third year of undergraduate study and numerical rating given for student clinical competence ability by an assessing registered nurse.

With reference to Figure 1, it is hypothesised that clinical and academic achievement in the students' third year of nursing study (latent variable 17) is directly influenced by the student's age (latent variable 1), whether the student uses English as a first language (latent variable 2), if the student has been given status or credit for previous studies successfully undertaken (latent variable 3) and the student's gender (latent variable 4). GPA scores, especially those derived from

the student's second year of study (latent variable 11) are hypothesised to influence directly the final achievement variable. Scores obtained for studies in the semesters' immediately preceding their course completion (latent variables 12 and 13) in addition to the number of awards held by the student (latent variable 10), impact directly on the students' final achievement. It is also hypothesised that achievement is directly influenced by how the students' self-rate their level of competence, before and after their last clinical secondment (latent variables 13 and 16 respectively). Lastly, achievement is also directly defined by academic achievement in academic topics undertaken in their last semester of study (latent variable 15).

Not all possible causal paths are shown in Figure 1 however, only those that are hypothesised to be of sufficient magnitude and expected to have recognisable influences are shown. It should be further noted that in testing the model, all possible causal pathways were examined.

METHOD

Participants

Subject to and satisfying ethical requirements for the study, a retrospective sample of 179 undergraduate nursing students enrolled in their final year of study in one School of Nursing, was chosen for this longitudinal research study. The sample consisted of 86 per cent female students, predominantly using English as their first language (72 per cent). The age range was 20 to 53 years with a mean age of 26 years. Just over a quarter (28 per cent) of the students had been given status for previous studies, which typically included 4.5 units of study usually undertaken in the first semester (one topic) and 4.5 units of study within each of the 9 unit topics in the second semester.

Data Collection

With full recognition of confidentiality issues, information about student admission variables was obtained from past student records. Grades for all topics (manifest variables) for each semester were derived by compiling all test scores that the students had undertaken throughout their studies. It should be noted that while the methods of student assessment varies according to the topics taken, all scores used in this study were converted to standard university grades. In terms of student self-assessment (latent variables 13 and 16), each student was asked in a survey, to rank how much supervision they believed they needed in order to demonstrate clinical competence in 16 different domains, related to clinical nursing practice. The survey was administered twice to the students, initially as they were about to embark on their last clinical placement and upon its completion, 15 weeks later. A Likert scale was employed using response categories reflecting student need for supervision, ranging from supervision being 'hardly needed', 'needed', 'highly needed' to 'essential'. This scale was seen as a continuum of student nurse ability and one measure of their capacity to demonstrate safe practice independently. Reliability rating for the use of this rating scale was acceptable (Cronbach alpha = 0.93).

Scaling was used also to define the final achievement variable (latent variable 17). Registered nurses, who had been working with the student, completed their final clinical assessment. This tool used a four-point Likert scale to measure if students could practice safely and independently and to what extent they required supervision. The response categories ranged from 'unsatisfactory performance', 'satisfactory performance', 'good', to 'excellent performance'. Written criteria were provided to assist clinicians to differentiate between the student ability levels. Cronbach alpha for scale reliability was also estimated to be 0.93.

Data Analysis

The Partial Least Squares Path Analysis (PLS-PATH 3.01) program (Sellin, 1989) was used to test the model of variables that were hypothesised to influence academic and clinical performance in nursing. It estimated the strength of the relationships between the predictor variables and

achievement or outcome measures (Noonan and Wold, 1985). The main aim of this procedure was to examine the causal relationships between the constructs of the model and to estimate the magnitude of influence of the hypothesised relationships had between the variables.

This procedure is highly appropriate for analysing and predicting relationships between educational data that are not normally distributed (Sellin, 1989) and it can also deal with relatively small numbers of cases, yet remain very robust (Falk and Miller, 1992). PLS path analysis can additionally account for influences hypothesised to act through causal models that traditionally confound experimental approaches, because it is clearly impossible to administer randomised controlled conditions to assess causality, in most educational settings (Keeves, 1988).

The presentation of the findings of the data collected in this study together with the estimated path models are shown in diagrammatic form in Figure 2.

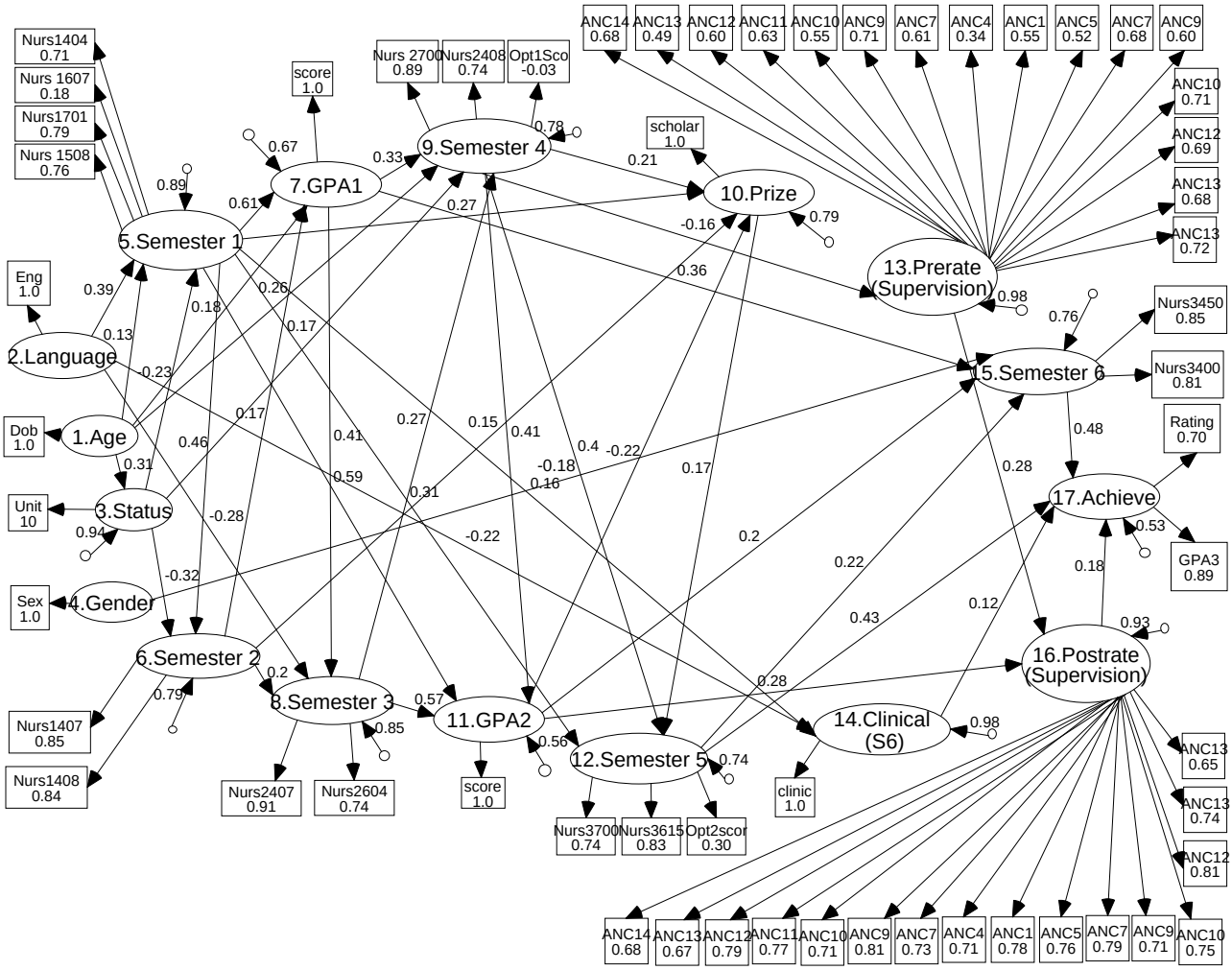

Figure 2: The final path model predicting nurse academic achievement and clinical competence

RESULTS

Figure 2 shows the final path model for the prediction and explanation of the variances that influence achievement in academic and clinical nursing for undergraduate students. A discussion, of which variables have a direct influence on nurse achievement, are discussed first and then an examination of how achievement is indirectly effected by other variables is introduced.

Direct Effects on Final Achievement and Nursing Competence

Semester 5 topics outcomes and effects on final achievement

The variable that describes student nurse outcomes at the completion of their fifth semester of study (latent variable 12) at university, has a positive co-efficient (0.50) leading from it to final achievement variable (latent variable 17). This indicates that students who did well in their penultimate semester of study, also performed well in their final units of study at completion of the university course.

The effects of clinical placement on final achievement

Where the nursing student was seconded to (either a private or a public hospital) for their final clinical placement is represented as latent variable 14. A positive co-efficient (0.10) operates from this variable to the achievement variable. This indicates that the type of clinical placement has a significant and direct influence on student nurse achievement. Registered nurses employed in private health care venues tend to rate student nurses more positively than registered nurses assessing student nurses in public health care venues.

The effects of semester 6 topics on final achievement

Nursing students who performed well academically in the final semester of study also did well in the final clinical assessments. From Figure 2, this is confirmed by a positive co-efficient (0.50), which operates from latent variable 15 to the final achievement variable.

The effects of the nursing student's self-rated need for clinical supervision on final achievement

At the conclusion of the undergraduate nursing program, completing students who self-rated themselves as needing minimal clinical supervision, performed significantly better in their final achievement overall. With reference to Figure 2, it can be seen that a positive co-efficient exists (0.20) between latent variable 16 (post rate for supervision) and the outcome variable.

Indirect Effects on Final Achievement and Nursing Competence

The indirect effects of nursing student language type on final achievement

There is a significant negative pathway arising from the student's language variable (latent variable 2) that extends to the clinical variable (latent variable 14) with a co-efficient of -0.2. This indicates that students who use English as a second language are more likely to be placed in a public clinical setting for their final clinical practice compared to native English speaking students. It is not possible to generalise this finding across all clinical placements for the students, as the study confined itself to the one period of time used for clinical placement.

The indirect effects of nursing student outcomes of semester 1 on final achievement

From Figure 2, it can be seen that two pathways operate from the semester 1 variable (latent variable 5) with one path leading to latent variable 12 (semester 5) and the other to latent variable 14 (clinical placement). This suggests that student success in semester 1 has an indirect influence on student nurse final achievement and it in turn mediates the effects of latent variables 12 and 14 on final achievement.

The indirect effects of nursing student's first year grade point average scores (GPA 1) on final achievement

The indirect effects of GPA 1 scores (latent variable 7) on final achievement are exerted through semester 6 scores (latent variable 15). This suggests that the influence of semester 6 scores on final achievement is in turn mediated by the GPA 1 scores. In this way GPA scores have a limited effect, and are not a strong predictor of final achievement in nursing.

The indirect effects of nursing student outcomes of semester 4 on final achievement

From Figure 2, it can be seen that one pathway operates from the semester 4 variable (latent variable 9) to latent variable 12 (semester 5). This suggests that student achievement with semester 4 topics, has an indirect influence of final achievement and it also mediates the effects of latent variable 12 on final achievement.

The indirect effects of nursing student outcomes of awards on final achievement

From Figure 2, it can also be seen that one pathway operates from the award variable (latent variable 10) to latent variable 12 (semester 5). This demonstrates that the variable associated with students who receive awards and prizes, exerts only a weak indirect influence of final achievement and it also mediates the effects of latent variable 12 on final achievement.

The indirect effects of nursing student outcome of GPA2 scores on final achievement

GPA 2 (latent variable 11) operates positively through two indirect paths. The first path leads through the semester 6 variable (latent variable 15) to the achievement variable, while the other path mediates achievement indirectly, through the self-rated student scores for level of clinical supervision needed on completion of last clinical placement (latent variable 16). This suggests that GPA scores achieved by student nurses in their second year of study only exert an indirect influence on final achievement.

DISCUSSION

Awarding Status including Recognition for Prior Learning (RPL) and Academic Achievement and Nursing Competence

The relationship between status given and final achievement needs to be considered carefully. Two negative co-efficients exist between the latent variable 3 (status) to the semester 1 (-0.2) and semester 2 achievement variables (-0.3) latent variables numbered 5 and 6 respectively. This indicates that a relationship exists between the amounts of status given or exemption granted to students upon nursing course admission, and their later performance in semester 1 and 2 topics. Students given status did not perform as well in semester 1 and 2 topics as those students who were not given any status at all. In this study, students who had been recognised as having prior learning were predominantly given status for two semester 1 topics. In the second semester, they were given exemption for certain components of the topics but not the entire topic. It was believed that students in this situation had some recognisable prior learning but full exemption was not granted. Students with status had less classroom contact than traditional students. The integrated nature of these topics (nursing practice skills with applied science and social science theory combined) meant however, that these students were potentially disadvantaged when it came to the assessments they were expected to undertake. For example, for one semester 2 topic the major assessment took the form of an examination that tested all components of the topic. This examination meant that students with exemption were tested on the assumption of possessing prior knowledge but in reality, they did not perform as well as students who had not been given

exemption. In the second topic for which students were granted exemption, they were required to complete only one aspect of the assessment (100% weighting) and consequently did not have the same opportunities as other students who might have performed poorly in this assessment, to improve their overall grade by performing better in the other assessment tasks. The model for awarding status needs to be reviewed as current practice impacts on student achievement.

In this study, students were awarded blanket status on the basis of holding registration as enrolled nurses (EN). However, these students were not a homogeneous group, as among them would be enrolled nurses who had minimal or no clinical experience outside their original course. There were others who had used enrolled nursing qualifications essentially as an entry point to the undergraduate nursing degree because they did not possess the appropriate Tertiary Entrance Rank (TER) for direct entry into the undergraduate nursing degree. Conversely among this group, there would be other enrolled nurses who would have a long history of clinical work, but did not possess recent academic exposure. Within this group there would be wide variations with respect to the area(s) in which clinical experience had been gained. Hylton, (2005) and Dearnley (2006) cautions EN's embarking on a degree course, by reminding them that their traditional education methods used in their past courses coupled with a so called 'apprenticeship type' culture where tradition and rituals continued to be commonplace, led to a situation where the student initially experienced low self confidence at the commencement of the undergraduate course. Hembrough and Sheehan (1989) also highlighted in their study, that the transition from EN to RN, required the development of a new self identity and that early in their studies, such students reported confusion and a decline in their self confidence.

The relevant literature is mixed with respect to awarding status and predicting achievement. Kilstoff and Rochester, (2004) have suggested that academic status given to students had no effect on academic or clinical expertise. Youssef and Goodrich (1996) and Duke (2001) reported similar findings. Although the participants in their study did not have a nursing background, they found that students who had been given status for prior learning, had lower GPA scores initially while on course, but this difference was not evident at the course conclusion.

If the awarding of status impacted negatively on student performance on semester 2 as argued in this study, the GPA for first year would be subsequently lower for those students compared to others who were not given any status in the first place. Consequently, given that there was a relationship between GPA 1 scores and student performance in semester 6 in this model, it could be realistically argued that students, who obtain status in first year, are not as likely to achieve as well as the other students in their performances in semester 6. This situation has implications for curriculum development, program design and clearly warrants further study.

This model does not show the same findings as Wall et al. (1993), Waterhouse (1993) and Byrd (1999) who reported that GPA scores were significant predictors of final achievement. Instead this model identifies GPA as having an indirect influence only on achievement through the academic scores in the students' last unit of study and through the students self-rating for competence of the ANC. However, this difference may be explained by the fact that in this model, GPA 3 was incorporated into the achievement variable and not measured independently.

Wheelahan et al. (2000) identified a philosophical debate around recognition of prior learning (RPL) and the perceived differences in the culture of the Vocation Education Training (VET) and the higher education sectors. The latter focuses on the relationship between the student's self-development and its context to clinical experience. With this approach it can be argued that awarding so called 'blanket' status for past studies does not best indicate or is not always sensitive enough to indicate how a student will cope with undergraduate study. Conversely, the former approach to awarding status to students is essentially and foremost an administrative process. Therefore while there is a high probability of a mismatch between the amount of status awarded and recognition of the student's past experience, it is strongly advocated that student access to accelerated programs need to be set on an individual basis. Rapley, Nathan and Davidson (2006) report from a review of Bachelor of Nursing programs, that there is considerable

variation in the amount of status given for prior learning and that a main consideration is whether the EN program undertaken by the student, was hospital based or VET sector based.

Northedge (2003, p171) explained that learning is "a process of acquiring the capacity to participate in the specialist discourse of a knowledge community". Therefore it can be argued that the students who have been granted less status have less exposure initially, to the academic discourse and therefore take more time to become literate in that discourse. This assertion is supported by Hylton (2005) who in her study, found that ENs engaged in a degree program, had not been adequately prepared for study at degree level. Their initial reliance on old ways of learning hindered their academic development as independent learners, even though they brought their life skills and work experience to the new situation. Draper and Watson (2002) went further and stated, that traditional ENs struggled with academic requirements of the degree course initially, the evidence being a higher level of resubmission of academic work compared to other students.

Measuring Students for Clinical Competence

Clinical assessment undertaken in semesters 5 and 6 aimed to reflect the ANC (Australian Nursing Council) competencies and in this study, student's self-assessment was used as one way of determining what degree of independence the student possessed, in order to meet individual competency statements and standards. Heslop, McIntyre and Ives (2001) linked student self-confidence and their perception of their own clinical competence as being entwined with the "nature and extent of the workload, knowledge of ward routine, and the manner of feedback on performance". The students in this study by the end of semester 5 (mid way through their third year of study) would have predominantly had 12 weeks contact with the clinical area. At this point in time, the students would possess a reasonable understanding of the ward routine and a better understanding of their performance, in relation to the ANC competencies. Additionally, they would have not only have completed their self-assessment for nursing competence prior to the next clinical exposure, but students were also applying for graduate nurse positions (work positions at hospital upon graduation). It would be a reasonable assumption that students would be very focused on demonstrating to others, positive aspects of their performance. It was noted that students differed in how they self-rated their performance at this point of time, particularly in light of their level achievement with semester 4 topics. There was an invariant relationship here. Students who did well academically in that semester of study (semester 4) tended to rate themselves as needing more supervision in order to show clinical competence. While students who did not perform as well in semester 4, rated themselves as needing less supervision clinically This negative pathway was derived partly by reference to two specific competency areas, namely communication competence and competence in the application of law to clinical practice which arose in topics offered in semester 4 studies. It could be argued that the students, who scored highly on the legal aspects in semester 4, had a heightened vulnerability to legal issues and the complexity of communication in relation to nursing practice, and hence perceived themselves as needing more supervision.

The ANC competencies were an accepted measure of achievement and students were expected to meet these performance standards for registration as a nurse with the Nurses Board of SA (NBSA). However this was also a limitation of the study, in that the overall reliability of assessment methodology used to measure national competency statements for nurses had its critics. One concern was the perception of student competence in the "eyes of the assessors" (Registered Nurses). Green (in Pitman, Bill and Fyfe, 1999) identified a subjective relationship between the assessors' understanding of competency and the validity of competency-based assessment. The ANC concurred that the understanding of the assessor was a critical element in order to achieve reliability especially with respect to accuracy of outcome of the assessment process. A search of the literature revealed multiple understandings of the term, 'competence', **(**See Ling, 1999; Manly Garbett, 2000; Masters et al., 1990; Rethans et al., 2002; Watson et al.,

2002). It is reasonable to assume that within the clinical sector, there are also multiple understandings of just what constitutes 'student competence' and 'student performance'.

It is assumed that assessment methods are objective; however, it is difficult to specify many professional skills in a precise and unambiguous way (Ashworth, Gerrish, Hargraeves and Mc Manus, 1999; Masters et al., 1990). For example, in the cues provided by ANC, which define competency elements, words such as 'appropriate', 'as necessary', 'regular' are used as descriptors for the assessor. What is 'appropriate' and how is 'appropriate' measured? Leung (2002) contends that the meaning of 'competence' is shaped by the assessor and is therefore not value free. Watson et al. (2002), cite several authors who conclude that the relationship between the assessor and the student is problematic with respect to assessment validity and reliability. Finucane et al. (2002) argue that assessors require "initial and ongoing training and their performance will need to be monitored". However the RNs who were the assessors for this cohort of students, did not undergo formal training in assessment, nor was the assessment of the competencies moderated and there was no mechanism established for providing feedback to the RNs on their judgement about the students they assessed.

The clinical environment can also impact on reliability and validity. Cusack (2001, pp. 243) reported from her study of the competency based model in nursing that:

> Clinical skills and knowledge were valued over the holistic approach to nursing care which includes broader attributes such as communication skills, attitudes and flexibility to think laterally when needed.

Furthermore, this has created an environment where assessment of competence is more narrowly focused on managing equipment or undertaking a particular task (Cusack, 2001). Similarly, Finucane et al. (2002) propose that professionally-oriented performance assessment is actually very demanding in terms of time and resources. These constraints similarly apply to the capacity of registered nurses to assess students for competence because apart from working in this difficult role, they execute it while also carrying a full clinical workload. This congestion of roles has implications for students in their bid to have accurate progressive feedback on their performance, beyond the narrow focus identified by Cusack (2001).

Student nurse language use and academic achievement and clinical competence

Unlike the findings of Chacko and Huba (1991) and Salamonson and Andrew (2006) who suggested there was a direct influence between achievement in nursing and student language use, this study demonstrated mixed outcomes.

It is noted that non-English speaking background (NESB) nursing students were performing well in their initial studies (at least as well as other native English speaking nursing students) but their achievement diminished later in their studies. A significant number of NESB students involved in this study originated from Norway, and completed their first year of study in their own country and joined Australian students in their second year, in Australia. This arrangement explained the overall trend of performance seen in this path model. Norwegian students who studied their beginning nursing topics did so in their own first language, with learning packages and teachers teaching in their first language in Norway. This explains why these NESB students were achieving so well, given that NESB students typically, are not usually as successful as their English native speaker counterparts. Indeed, when Norwegian students attempted clinical academic topics in semester 3, their performance diminished. It was at this point of time of their program that these NESB students were physically in Australia, receiving their instruction and learning packages in English (their second language). Therefore, it can be recommended that they require English language support at this time or ideally, even earlier in their course, when they are in their own country. Another factor for diminished NESB student performance in semester 3, could be due to the fact that that NESB (Norwegian) students were only just at this point of time, gaining their first exposure to the Australian health care system, which would not only be new to

them but would render assignments about their host country's health care system more difficult compared to their native English-speaking student counterparts.

Student self-rating for clinical competence

This study has shown that the students' capacity for self-rating their own levels of clinical competence had a significant impact on their overall achievement. At a time when students are about to complete their undergraduate studies and enter the workforce as qualified nurses, historically, there had been a reluctance on the part of the profession to view this form of assessment as credible, reliable and realistic, preferring instead to rely on traditional assessment methods. Data from this study indicates that it is the completing nurses themselves who tend to be quite critical of their clinical competence and do not see this form of assessment as frivolous. Self-assessment complements traditional clinical assessment methods and can quickly highlight to clinical or teaching staff, which aspects of clinical practice, the students themselves believe they need more assistance to become clinically competent. Self-assessment for clinical competence serves to inform potential new employers of areas of nursing competence, which they themselves believe require further development as beginning graduate nurses. This information is valuable for staff development purposes for hospital employers who seek to help the completing student with their transition of the new graduate nurse.

Final clinical experience and type of clinical venues attended

It has been shown in this article that variance in the clinical competence ratings given about completing students by their assessors (Registered Nurses), differ according to the type of venue in which the student is seconded to for the last clinical experience. While such variance can be minimised with the strategies provided above, clinical assessor preparation needs to be reviewed. Clinical nursing staff who are involved with student assessment irrespective of whether they are employed by the private or public sector hospitals, continue to need assistance and staff development when it comes to assessing students for clinical competence. While beyond the scope of this paper, it can be argued that the amount of preparation given to clinical staff who comprise dedicated education units (DEUs) can become the benchmark against which all venues that receive students for work experience need to be prepared for.

Final academic topics and achievement

Academic topics offered in both semesters of the students' last year of study, all have a positive and direct impact on eventual achievement. There are no inverse relationships between topic successes at this point of time and overall achievement at course completion. It is noted however, that the co-efficient value that exists between the Option topics offered in semester 5 are very low compared to other topics offered at that time. This suggests that unlike the other topics offered in semester 5, there is greater variance in student performance for the option topics offered at this time. While this has no major influence on the student's eventual achievement or outcome, it is likely to have a negative impact on the students' (depending on which option topic they chose to study) overall grade point average score (GPA), which employers do note when considering employing graduates. While it is common practice to offer option topics to students nearing the completion of their undergraduate programs, this study suggests that there is considerable variation of scores obtained by students across the different Option topics that were offered to students in their penultimate semester of study.

CONCLUSIONS

Significant variance (72%) related to achievement and clinical competence for beginning entry nursing students during their third year assessment can be explained by four variables, none of which are related to student demographics such as age or gender, but exclusively confined to variables associated with the students' progression through their undergraduate course. The students' grade point average scores attained during their earlier years of study have only limited

value in predicting final achievement. However, success in penultimate study areas prior to actual course completion provides the most reliable estimates for academic success. Identifying consistent measures for identifying for student clinical competence remain problematic. However, the incorporation of student self-assessment for clinical competence nearing course completion, is seen as one predictor for identifying competence overall. What level of competence is required to ascertain whether a graduating nurse can perform well, and how this can be measured requires ongoing professional debate and research.

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