FACTORS AFFECTING THE PROGRAMME COMPLETION OF PRE-REGISTRATION NURSING STUDENTS THROUGH A THREE YEAR COURSE: A RETROSPECTIVE COHORT STUDY

Jane Wray, Jo Aspland, David Barrett, Eric Gardiner

INTRODUCTION

The future of the nursing workforce in the European Union (European Federation of Nurses' Associations (EFN) 2012) and worldwide (Adams 2012, Gantz et al. 2012) is an ongoing cause for concern. In the United Kingdom (UK), an ageing nursing workforce, coupled with a reduction in the number of commissioned places for pre-registration nurse education places (Buchan and Seccombe 2012) is likely to create an 'impending shortfall in nursing' (Imison and Bohmer 2013) with subsequent impacts on patient care (Royal College of Nursing (RCN) 2013). Faced with this challenge, the main policy options are to improve the retention of existing nurses, to reintroduce a substantial level of international recruitment or to increase nurse education numbers (Buchan and Seccombe 2013). Increasing the number of commissioned places for nurse education will have a significant impact on intakes to programmes and subsequently the workforce (Willis Commission 2012); however, there is uncertainty regarding commissioned places and intake numbers across the UK.

Applications to nurse education courses remain buoyant throughout the UK. In 2013 the number of applicants increased by 5.6% (12,000) compared with 2012 and applications to nursing courses are increasing (3.1%) showing that student demand remains strong. This may be because nursing is seen as providing some employment security. However, uncertainty regarding possible changes to funding arrangements in higher education will affect the

financial support available to student nurses and, consequently, this demand may not be sustained.

If the reduction in commissioned places persists, addressing the ongoing issue of programme completion becomes a priority for the sector (Health Education England 2015).

BACKGROUND

There is considerable variability in non-progression (attrition) from one Higher Education Institution (HEI) to another, and the data available is inadequate for meaningful comparisons to be made (Willis Commission 2012, Health Education England 2015). The only systematically reported data show that around 27% of pre-registration diploma students leave their course (NHS Education for Scotland 2011). Data for England indicates that students dropping out by the end of year two fell from over 12% (2008-09 intake) to 8% (2009-10 intake); these figures do however exclude final year students and London-based students (Buchan and Seccombe 2012). In the US, attrition rates have been reported to be as high as 50% for baccalaureate nursing programs and 47% for associate degree programs (Harris et al. 2014). Studies of retention such as these have tended to centre on student attrition after the first year of study only. The Willis Commission reported on data for student nurses exiting programmes by end of year two in the UK as 8% (2009-10) but there were no data available for final year students.

The inadequacy of the evidence base in relation to attrition is a likely consequence of variations in definitions and measurement. The term attrition is also used interchangeably with that of retention, compounding the confusion (see Box 1).

(Insert Box 1 here)

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With no standardization in terms of definition and data set (Dante et al. 2015), the UK Department of Health (DoH) consulted on this concern, eventually implementing a definition which was based on successful programme completion. This definition was to be applied to those who successfully complete (DoH 2006):

$$\frac{\text{Starters(a)} + \text{Transfers In(b)} - \text{Transfers Out(c)} - \text{Numbers Completing(d)}}{\text{Starters(a)}}$$

However, despite this move to the standardised definition, published data on attrition across the sector remains sparse; a deficit acknowledged in the Shape of Caring Review (Health Education England 2015). Whilst published data will assist greatly in understanding the range and extent of the problem across the sector, it will not necessarily provide insight into why students do not successfully progress or what programmes might do to address it.

Numerous factors seem to be relevant to understanding these issues; there appear to be both 'push' and 'pull' factors, i.e. factors that account for why students leave and why they stay (Wray et al. 2012a). One study of retention found two main themes emerged following analysis: 'personal' and 'programme' (Cameron et al. 2011). Subthemes were identified as profession, student support, personal characteristics and family. Personal commitment and the availability of support were essential for student retention and progression (Cameron et al. 2011, Bell 2014). 'Personal' factors include age, ethnicity, disability, gender, personal circumstances, and previous experience of caring. Older students seem to be more likely to successfully complete their programmes than younger ones (Anionwu et al. 2005). This may be because an older student makes a more informed career choice having developed more appropriate skills than their younger peers (Gorard et al. 2006). Black and Minority Ethnic (BME) students and those born abroad in English speaking countries appear to be more likely

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to successfully complete their programmes than white British students (DoH 2006); although those students who come from non-English speaking backgrounds appear to be high risk in terms of attrition related to placement factors (Rogan et al. 2006). Other studies have found domicile of birth to be largely irrelevant (Pryjmachuk et al. 2009).

Students with a specific learning disability (SPLD), such as dyslexia, appear more likely to leave in year one and less likely to finish the full programme than those without a SPLD (Richardson and Wydell 2004). However, the completion rate of SPLD students are broadly the same as their peers given appropriate teaching and support (Saunders and White 2002, Wray et al 2012b). Gender is also a potential factor - male students have been found to be less likely to complete when compared to female students (Anionwu et al. 2005). Personal issues such as family problems, unsuitable childcare support and a lack of flexibility from the institution can contribute to the students decision to exit the programme (Glossop 2001; Waters 2006a, b).

'Programme' issues include academic failure, programme quality, appropriate programme choice and clinical experiences (in nursing especially) (Andrew et al. 2008). Last and Fulbrook (2003) found that, with the exception of academic failure, no single factor was found to contribute to the decision to leave. Glossop (2001) found that academic difficulties were another common reason for non-completion. Students with minimum entry requirements or those attending an institution which was not their first choice are also more likely to leave (DoH 2006), as are those who are disappointed in the course or feel under-valued by the institution (Last and Fulbrook 2003).

Despite the fact that placement experience forms a significant proportion of study time in health professional programmes, little work has been done on placement factors and progression (Eick et al. 2012, Francis 2013). Poor experiences on placement can influence the

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decision to exit the programme (Eick et al. 2012, Pryjmachuk et al. 2009), and poor communication between the academic and clinical setting can exacerbate a student's poor experience (Last and Fulbrook 2003). Nursing can be demanding and put students under stress, another factor linked with attrition (Watson et al. 2009).

Most students who exit a course of study do so within the first year of the programme (Waters 2006a) and research had tended to focus on this particular period (Dante et al. 2015). Students who leave within a few weeks of enrolling are often unprepared for the demands of university and have competing priorities and roles outside of the programme or may dislike the course – these students are less likely to return to nursing (Andrew et al. 2008). Those that leave midway through the first year tend to experience some type of 'crisis' which means that they cannot complete at that time; these students are more likely to want to return to nursing in the future (Andrew et al. 2008).

The many and varied factors affecting attrition and programme completion are still not fully understood. Some characteristics of 'at risk' students have already been identified in the literature. However, evidence tends to relate generally to all students rather than to nursing students in particular, and categories are often ambiguous and/or inadequate. Studies have tended to focus on voluntary exit interviews (Pryjmachuk et al. 2009) and those that leave are not necessarily representation of the study body as a whole. In addition, students may have difficulty verbalising their reasons for leaving as these are numerous, inter-related and often complicated (Deary et al. 2003). Most students do in fact successfully complete and qualify; however, student perspectives as to why they are successful also remain largely unexplored in the literature (Bell 2014). A more appropriate way of exploring the factors related to attrition or progression is to use a multi-factorial approach rather than identifying a single

factor (Pryjmachuk et al. 2009). The current study used a multi-factorial approach to examine factors that correlated with successful programme completion.

RESEARCH DESIGN

The study aimed to map student characteristics at entry to the programme against Year 3 completion data to examine non-progression and successful progression. A retrospective study was undertaken collecting data from five cohorts of pre-registration nursing students in a single institution in the north of England to explore factors affecting successful completion.

Pre-existing data sources were used to minimise access and recruitment issues and provide a time- and cost-effective method. Nursing students (n=807) were informed about the study and offered the opportunity to opt out. Data collection took place between October 2009 and April 2014 from the institution's electronic student record system which holds all student data from application through to completion. Hard copy searches were conducted to gather data on dependents and previous experience of caring. Students were excluded if they requested that their data was not used, or if they had an incomplete dataset. Ethical approval was granted by the Faculty's Research Ethics Committee (REC). As data was taken from a pre-existing data system with no direct contact with participants necessary, the ethical implications were considered to be minimal. All data were anonymised, aggregated and held securely in accordance with the Data Protection Act 1998.

DATA ANALYSIS

All data were collected in Excel 2010 and imported into SPSS v20 for Windows and R Version 3.0.0 for analysis purposes.

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An outcome measure 'Completion' was created with three categories:

i.) (Successful) Completion, if the student was awarded a qualification in Nursing at the end year three (even if a lesser qualification than that they were initially registered for) ;

ii.) Non-completion: academic reasons, if the student left the programme at any stage because of academic failure and;

iii.) Non-completion: non-academic reasons, for example, if the student left the programme at any stage in the programme without a qualification because of non-academic reasons. These reasons included medical reasons, professional reasons, transfer to another university, or transfer to another academic department, and for the remainder of this paper will be referred to as 'other'.

Intercalating students - those who 'stepped-off' their programme for a period of time and then returned - were assigned to one of these categories in the same manner, provided that they had completed their study in Nursing, with the only difference being that those having intercalated for more than two years were deemed to fall into the category 'Non-completion: other reasons'.

Data were collected on 807 students. A total of 81 students were excluded because they had missing data on predictor variables and a further 1 was excluded because they had missing data on the outcome measure (as a result of intercalating and not finishing their degree at the time of analysis). 725 students had complete data sets and were included in the analysis.

Multinomial logistic regression was used to model the dependent variable Progression Outcome with the three categories against a number of different predictor variables (see

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Table 1). These variables were selected as they were accessible via the electronic student record system and prominent in the literature on retention. Of these predictors, Age on Entry was analysed as a continuous variable. The remaining variables were analysed as categorical. Initially, a univariable regression model was used to test each predictor. Successful Completion was used as the reference category for the outcome measure.

As some cell counts in the two-way tables of outcome measure against categorical predictor variable levels were zero or very small, the R pmlr (Penalised Multinomial Logistic Regression) package (Colby et al. 2010) was used. Standard regression estimation methods in this situation can produce large, unreliable regression parameter estimates (Harrell 2015, pp. 309-312) or possibly even a warning from statistical software that parameters cannot be estimated. Penalised regression shrinks these estimates towards zero or, equivalently, adds small numbers to zero and small observed cell counts. This is based on the plausible assumption that the probability of any cell count combination is greater than zero, even if the observed count is zero. Likelihood ratio chi-square tests were used to test for significant effects on the odds of successful completion relative to both unsuccessful outcome categories for each predictor in a univariable analysis. Predictor variables with p-values of less than 0.1 in the univariable analysis were then included in a multivariable regression model. A significance level of 10% is recommended (e.g. in Collett 2003) during the development of multivariable logistic regression models in order to avoid rejecting potentially useful predictors too readily.

RESULTS/FINDINGS

Table 1 shows that 76% (554/725) of those students included in the analysis completed their course. Of those who did not complete at the end of Year 3, 17% (120/725) left early as a

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consequence of academic failure and 7% (51/725) for 'other' reasons. Of those who progressed at the end of Year 1, 1.4% subsequently left their course early for 'other' reasons and a larger percentage of 5.5% left early because of academic failure. Thirty four students had intercalated when end of year 1 data were examined. Of this number, 8 students (24%) successfully rejoined and completed their course by the end of year 3 analysis. In view of the small frequencies, the categories Black and Other were merged for Ethnic Group and categories within Disability status were merged to give three categories: None, Dyslexia from beginning of course or diagnosed during course, and Other Disability from beginning of course or diagnosed during course.

[Insert Table 1]

In the univariable analyses, the following variables had p-values less than 0.1: Programme, Age on Entry, Domicile, Entry Qualifications and Dependents. These were then entered into the multivariable model for analysis (see Table 2). For ease of interpretation, descriptive statistics for these predictor variables are presented rather than parameter estimates from the multinomial regressions.

[Insert Table 2]

In relation to understanding the likelihood of students successfully progressing to qualification, a number of issues emerged as important. Older students were less likely not to complete for academic and 'other' reasons (p=0.008 and p=0.06 respectively). In relation to programme, cohort and branch, only programme was significant and degree students were more likely not to complete for 'other' reasons than Diploma students (13.5% compared to 5.9%; p=0.006). Another finding that emerged as significant was that students who lived away from the local area at all times were more likely not to complete for 'other' reasons than

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those who lived locally at all times (11.4% compared to 4.9%; p=0.022). Students who lived

in the local area during term-time only were also more likely not to complete for 'other'

reasons than those who lived locally at all times (24.5% compared to 4.9%; p<0.001). That is,

students who lived locally at all times were more likely to successfully progress. There was

some evidence that completion is more likely for those students with a Level 4/5 entry

qualification (e.g. a foundation degree, diploma or certificate in higher education) than those

with a Level 2 entry qualification (GCSEs grades A-C or equivalent) (79.7% compared to 75.0%;

p=0.082). Students with dependents were less likely to have non-completion of either type

than students without dependents (18.3% compared to 11.2%; p=0.016 and 7.9% compared

to 4.5%; p=0.077 respectively for the academic and 'other' reasons).

In the multivariable analysis (Table 3), only Age on Entry and Domicile or alternatively

Dependents and Domicile emerged as statistically significant (p<0.05) predictors. Age on

Entry rather than Dependents was used in the model as the former is antecedent to the latter.

The odds of non-completion for academic reasons to completion decrease by around 3%

(odds ratios estimate of 0.968≅1-0.03) for each additional year. Students who lived away

from the local area at all times and students who were local during term time only were more

likely not to complete for 'other' reasons than students who were local at all times (p=0.024,

odds ratio estimate=2.62 and p<0.001, odd ratio estimate=6.13 respectively). Parameter

estimates for the non-significant predictors, Entry Qualifications and Programme were

consistent with the corresponding estimates for these predictors in the univariable

regressions. It could be hypothesised the likelihood of completion is associated with

academic ability and both these predictors are acting as very crude proxy measures of

academic ability. Stronger statistical evidence for an association might have been found had we been able to use a more reliable measure of academic ability.

[Insert Table 3]

DISCUSSION

In this study, 76% of students successfully completed their programme, comparing closely to the NHS Education for Scotland figure of 73% (2011). It was found that two key variables were of significance in this study – age (and academic non-completion) and domicile (and non-completion for 'other' reasons). As Age on Entry increased, the students' likelihood of not progressing after the first year (either due to academic or 'other' reasons) became less. In essence, this study would appear to support the argument that older students are more likely to progress than their younger peers. This finding is compatible with other research studies (Northern Ireland Practice and Education Council for Nursing (NIPEC) 2011, Pryjmachuk et al. 2009), although some authors dispute this (Shelton 2012). The general trend in the non-nursing student population is that older students are at greater risk of attrition. It appears that this trend may be reversed in nursing and that encouraging older applicants into nursing would appear to be a positive step. While the number of younger students choosing nursing as a career has declined, the number of older students has not (Auerbach et al. 2007) - today's nursing student is likely to be older, have more family responsibilities, be employed in addition to attending university, and have been out of education for several years (Jeffreys 2007). Older students are also more likely to have multiple financial pressures (Harris et al. 2014). However, goal-oriented motivational drives, support systems, success-driven study habits, and self-confidence contribute to students' successful program completion (Fayette

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2012, Bell 2014), characteristics perhaps associated with these older students. The average age of a nursing student in the UK was 29 in 2012 (Willis Commission 2012), significantly older than the general higher education student population (HESA 2013).

Although it is recognised that programme issues are relevant to understanding retention and progression, the only programme related issue found to be significant in this study was whether the student was studying for a degree or a diploma. However, with the move to an all-graduate nurse education in the UK, this finding is no longer of significance. It is still an important consideration for countries where dual levels of nurse education still exist, and retention remains a key concern across the EU (Dante et al. 2015). In addition, while the student electronic record system captures data on 'other' reasons for non-completion, the data on non-completion for academic reasons only capture one outcome: academic failure. Therefore, it was not possible to examine programme related issues such as quality, programme choice and clinical (placement) experience in relation to progression as this level of detail was not available via the student records system. In addition, other variables identified as significant in the literature, were not included in the multivariable analysis as they were not significant in the univariable analysis. Research that explores student perspectives and differentiates between programme specific factors that impact upon successful completion may be a suitable way forward for future research in the UK. Whilst some research in the EU has explored programme factors (Dante et al. 2009, 2011, 2013a,b,c, 2015) it is still not clear which factors are especially relevant to understanding retention.

Domicile also appeared to be significant, particularly for non-completions for 'other' reasons. The student's actual place of residence appeared not to be an issue: instead, it was whether the student had a temporary term-time address or not. Linking to age on entry, it may be that

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older students who are living locally may have well-formed support systems; this has not been explored previously in the literature. Zepke and Leach (2005) suggested that institutions should look at the undergraduate experience they provide to make sure students retain their connections and support outside of the institution, as this might make them more resilient to the challenges a nursing programme presents. Nurses having 'a sense of belonging' that is linked to identifying with the profession is seen as important (Willis Commission 2012).

The findings of our study in relation to qualifications at entry mirrored those of many others (NIPEC 2011, Pryjmachuk et al. 2009), in that students with a higher level entry qualification were more likely to progress and complete. A high level of applications for fewer places is likely to impact on entry level qualification and this may well affect progression (Santry 2012). Other factors examined, such as gender, disability and ethnicity were not significant in this study. However, this may be because the students included in our study were atypical. The majority (97%) were White British, a higher percentage than that reported by the Nursing and Midwifery Council (NMC) for students (72.4%) or nurses (83%) (NMC 2011). However, the majority of students recruited to the institution are local, and the local population is 89% white with little diversity (Office for National Statistics (ONS) 2012).

Of our sample, 16.5% reported a disability, higher than the 5.5% reported by Nursing and Midwifery Admissions Service (NMAS 2007). This could be because NMAS only reports data at the application stage, and students may be identified as disabled during their programme (Wray et al. 2012b). Proactive systems to support inclusion, encouraging students to declare a disability and access support undertaken at the institution may have affected these figures (Wray et al. 2012b). The uniqueness of the sample in this study may limit the generalisability of the study findings. The students in this sample were less diverse in terms of ethnicity than

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might be found in other cohorts, but also had a higher than average level of disabled students. The age of the students varied from 17 to 48; and this is not typical of nursing cohorts, particularly in non-UK countries (Dante et al. 2015). Therefore, the study findings may not be generalizable. The study – unlike most others looking at retention - also looked at those students who had intercalated at end of Year 1 to see whether they had returned to the programme. Almost a quarter successfully rejoined the course and qualified as a nurse. Intercalation is an area of research that so far has seemingly been ignored by the literature.

Nurse education continues to change and develop in response to workforce challenges (Health Education England 2015), and preparing the next generation of nurses will require an innovative response (NMC 2010). The establishment of standardised definitions and a UK wide data set will provide a useful starting point for understanding the range and extent of attrition in higher education. Transparency will enable comparisons to be made between institutions; best practice that can then be shared and embedded across the sector as a whole. However, even with the most robust and sophisticated screening and selection procedures, some attrition will occur. In fact it is inevitable, and often due to factors that are without of the control of the programme or the individual student, and therefore the sector must consider what might be the parameters of an acceptable level of attrition. In addition, focusing on successful progression (rather than attrition) will assist in identifying programme and placement factors that are within the control of higher education and can be cultivated and enhanced to facilitate student success.

CONCLUSION

The number of UK nursing students who successfully progress their studies appears to be increasing; better screening of applicants and improvements in student support may be the reason for this. Higher age on entry and domicile were associated with completion in this study; domicile has not previously been explored in the literature. Recruiting older, local students may be a positive step for HEIs; there is a critical mass of literature indicating that higher age on entry is significantly associated with completion. A distinction should be made in terms of non-retention for those who fail for academic or 'other' reasons: this study found that older students were less likely not to complete for academic and 'other' reasons, whilst domicile was significant for 'other' reasons only. With the average age of nursing students rising, our study indicates that this will impact positively on future rates of completion.

There is currently little reliable, consistent information on attrition, progression and completion, despite concerted efforts across the UK nurse education sector. This study contributes to the evidence base by identifying some of the factors that may facilitate progression. However, without some uniformity in definition, categorization and measurement across the HEI sector, understanding attrition and progression and comparing attrition data between institutions will remain problematic, making comparisons and an accurate larger picture difficult.

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BOX 1

Box 1: Examples of definitions in use:

Retention:

"persistence, or choosing to continue in a nursing programme, and successful academic performance or meeting the necessary academic standards to continue in a nursing programme" (Shelton, 2012)

"student attainment of academic and/or personal goals, regardless how many terms a student is at college" (Seidman 2005 p14)

Attrition:

"the number enrolled (not those that start) against those that graduate (or are active with no outcome) regardless of transfers in and out" (NHS Education for Scotland 2011)

"a student who fails to re-enrol at an institution in consecutive terms" (Seidman 2005 p14)

TABLE 1

Summary of variables used in the analysis

Completion status
Completion n=554
Non-completion: academic reasons n=120
Non-completion: non-academic reasons n=51

Cohort
Sept 06 n=143   Feb 07 n=105   Sept 07 n=207
Feb 08 n=62   Sept 08 n=208

Programme
Advanced Diploma n=614   BSc n=111

Branch
Mental Health Nursing n=73 Adult Nursing n=547   Children's Nursing n=78
Learning Disability Nursing n=27

Gender
Female n=679 Male n=46

Age at Entry
Mean =25.3 (SD=8.39)

Ethnic Group
White n=703   Black n=14   Other n=8

Disability
No declared disability at start and no declared change n=606
No declared disability at start, dyslexia/other learning difficulty diagnosed during course n=3
No declared disability at start, other disability diagnosed during course n=4
Dyslexia/other learning disability from start n=77
Other disability from start n=35

Domicile
Non-local at all times n=79   Local during term time only n=53   Local at all times n=593

Change of home post code during course
Yes n=32   No record of change n=693

Change of term-time post code during course
Yes n=47   No record of change n=678

Entry Qualifications
Level 2 n=168   Level 3 n=463   Level 4/5 n=69Level 6 n=25

Previous Experience Caring
Yes n=595   No n=130

Dependents
Yes n=178   No n=547

TABLE 2

Significant predictors from the univariable regression analyses

	Completion	Non-completion (academic reasons)	Non-completion (other reasons)	Total
Age at entry mean (SD)	25.8 (8.42)	23.6 (8.22)	23.5 (7.83)	NA
Programme				
Degree	78 (70.3%)	18 (16.2%)	15 (13.5%)	111
Diploma	476 (77.5%)	102 (16.6%)	36 (5.9%)	614
Domicile				
Non-local at all times	56 (70.9%)	14 (17.7%)	9 (11.4%)	79
Local during term time only	41 (58.5%)	9 (17.0%)	13 (24.5%)	53
Local at all times	467 (78.8%)	87 (16.4%)	29 (4.9%)	593
Entry Qualifications				
Level 2	126 (75.0%)	31 (18.5%)	11 (6.5%)	168
Level 3	352 (76.0%)	80 (17.3%)	31 (6.7%)	463
Level 4/5	55 (79.7%)	6 (8.7%)	8 (11.6%)	69
Level 6	21 (84.0%)	3 (12.0%)	1 (4.0%)	25
Dependents				
No	404 (73.9%)	100 (18.3%)	43 (7.9%)	547
Yes	150 (84.3%)	20 (11.2%)	8 (4.5%)	178

TABLE 3

Results from the multivariable multinomial regression

	Log Odds Ratio	Standard Error	Odds Ratio	P-value	95% CI for Odds Ratio
Progression Categories[1]					
Non-Completion (academic reasons)					
Intercept	-0.740	0.346	NA	NA	NA
Age on Entry	-0.033	0.013	0.968	0.011	(0.941,0.993)
Domicile[2]					
Non-local at all times	0.187	0.317	1.205	0.560	(0.628,2.185)
Local during term-time only	0.211	0.393	1.235	0.596	(0.546,2.567)
Non-Completion (non-academic reasons)					
Intercept	-2.290	0.535	NA	NA	NA
Age on Entry	-0.018	0.020	0.982	0.358	(0.941,1.020)
Domicile					
Non-local at all times	0.965	0.398	2.624	0.024	(1.145,5.557)
Local during term-time only	1.814	0.388	6.133	<0.001	(2.817,13.00)

[1]Reference category: Completion
[2]Reference category: Local at all times