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Original Research Article

Attrition in new obstetrics and gynaecology residency: can we identify risk factors at selection?

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ABSTRACT

Background: Resident attrition is costly and stressful to both residents and healthcare systems. Singapore remodelled its specialty training system 10 years ago, adopting the Accreditation Council for Graduate Medical Education International (ACGME-I) framework. A greater understanding of risk factors and trends of attrition could better inform the resident selection process. We aimed to determine if risk factors for resident attrition can be identified through demographic data available at the time of resident selection, and secondly, if differences exist between attrition rates of OBGYN residents under the SingHealth ACGME-I programme and the earlier British-based specialty training (BST-AST) programme.

Methods: Anonymised demographic data of all SingHealth ACGME-I obstetrics and gynaecology residents between 2011 and 2018 were retrospectively obtained and compared according to “stay” and “attrition” groups. Attrition rates from the BST-AST programme were obtained from the hospital's departmental database.

Results: From 2011 to 2018, 77 residents were enrolled. There were 5 premature departures, all voluntary. No significant differences were found in demographic parameters between “stay” and “attrition” groups. The annual attrition rate for this programme was 2.07%, versus 3.45% for BST-AST trainees between 2002 and 2011 (OR 0.556, 95% CI 0.140–2.207).

Conclusions: Demographic data alone cannot predict risk of resident attrition as decisions to leave specialty training are complex. Introduction of the ACGME-I accredited residency programme appears to reduce resident attrition rates.

Keywords: Internship and residency, Risk factors, Education, Medical, Graduate, Singapore

INTRODUCTION

Resident attrition undeniably affects manpower and financial planning for all training programmes. The American College of Obstetrics and Gynaecology estimates an annual training cost of US\$80,000 per resident annually.¹ SingHealth, the largest residency sponsoring institution in Singapore, reported an average annual attrition rate of 3.2% between 2010 and 2016.² Recognizing applicants at risk of attrition may improve how residents are selected for training. Presently, there is

no published data about cost of resident training in Singapore.

This study aims to determine if risk factors for attrition can be identified through demographic data available at the time of resident selection. Secondly, this study aims to determine differences in attrition rates of obstetrics and gynaecology (OBGYN) residents in Singapore under the current Accreditation Council for Graduate Medical Education International (ACGME-I) programme and those from the former British-based basic and advanced specialty training (BST-AST) programme.

METHODS

Study design

This was a retrospective cohort study assessing attrition among OBGYN residents under the ACGME-I programme and comparing attrition rates with the earlier BST-AST residency programme.

Study place and period

Data were obtained from two major Singapore hospitals: SingHealth OBGYN residency programme (commenced ACGME-I in 2011 through the 2018 intake) and the Department of OBGYN at KK Women's and Children's Hospital (2002–2011).

Selection criteria

Anonymized demographic data of all OBGYN residents enrolled from commencement of the ACGME-I programme in 2011 to the 2018 intake were obtained from the SingHealth OBGYN residency programme database.

Data collection and procedure

Data collected included age, gender, marital status, nationality, education background and prior work postings. Current residents and those who completed the programme were enrolled into the “stay” group and residents who left the programme prematurely were in the “attrition” group.

The rate of attrition from the former OBGYN BST-AST programme from 2002 to 2011 was retrieved from the database at the Department of OBGYN at KK Women's and Children's Hospital (KKH). Rates of attrition of both programmes were compared. Average annual attrition rate was defined as the ratio of the mean number of residents who prematurely exited from training per year to the mean

number of residents who were present at the start of each training year.

Statistical analysis

Statistical computations were conducted using Microsoft Excel. Continuous variables were compared using independent two-sample t-tests, while categorical variables were analyzed using Fisher's exact test. Odds ratios (ORs) were calculated to quantify the strength of associations. Statistical significance was set at $p < 0.05$.

RESULTS

Since 2011, 77 residents were accepted into the SingHealth OBGYN ACGME-I residency programme. During this period, there were 5 (6.5%) voluntary separations. Two residents left in their first year of residency, one in their second year and two in their third year. The annual attrition rate for this programme was 2.1%.

Demographic data and comparisons between the “stay” and “attrition” groups are summarized in Table 1. The mean age at entry to residency was 27.4 years in the “stay” group and 25.6 years in the “attrition” group. All residents in the “attrition” group were female and Singaporean. Married residents only consisted 20% of the “attrition” group compared with 45.8% in the “stay group”. Similarly, residents with previous medical officer experience made up 20% of the “attrition” group compared with 47.2% of the “stay” group. International medical graduates had a higher attrition at 9.1% versus 4.5% of graduates from Singapore. However, no statistical differences were observed between age at entry to residency, gender, marital status, race, nationality, country or order of obtaining medical degree, postgraduate year at entry into residency and objective work experience as house officer or medical officer in any OBGYN posting prior to entering residency training.

Table 1: Comparison in demographic data between the “stay” and “attrition” groups.

Demographic Data	Total n=77	“Stay” ^a n=72 (%)	“Attrition” ^b n=5 (%)	P value ^c	Odds ratio (95% CI)
Mean age (years) at entry to OBGYN residency	27.3	27.4	25.6	0.178 ^d	
Gender					
Male	11	11 (100)	0 (0)	0.452	0.486 (0.025–9.408)
Female	66	61 (92.4)	5 (7.6)		
Marital status					
Single	43	39 (90.7)	4 (9.3)	0.212	3.385 (0.360–31.788)
Married	34	33 (97.1)	1 (2.9)		
Race					
Chinese	73	68 (93.2)	5 (6.8)	0.760	0.723 (0.034–15.231)
Malay	1	1 (100)	0 (0)		
Indian	3	3 (100)	0 (0)		
Nationality					
Singaporean	62	57 (91.9)	5 (8.1)	0.269	2.965 (0.155–56.594)

Continued.

Demographic Data	Total n=77	“Stay” ^a n=72 (%)	“Attrition” ^b n=5 (%)	P value ^c	Odds ratio (95% CI)
Non-Singaporean	15	15 (100)	0 (0)		
Singaporean permanent resident	12	12 (100)	0 (0)		
Employment pass	3	3 (100)	0 (0)		
Completed degree before medical school					
Yes	8	8 (100)	0 (0)	0.569	0.690 (0.035–13.611)
No	69	64 (92.8)	5 (7.2)		
Country of medical school					
Singapore	44	42 (95.5)	2 (4.5)	0.261	0.524 (0.083–3.319)
Outside of Singapore	33	30 (90.1)	3 (9.1)		
United Kingdom	18	15 (83.3)	3 (16.7)		
Australia	7	7 (100)	0 (0)		
Ireland	3	3 (100)	0 (0)		
Malaysia	2	2 (100)	0 (0)		
China	1	1 (100)	0 (0)		
India	1	1 (100)	0 (0)		
New Zealand	1	1 (100)	0 (0)		
Postgraduate year (PGY) at entry into residency					
PGY 2	34	30 (88.2)	4 (11.8)	0.164	5.600 (0.596–52.649)
PGY 3 and above	43	42 (97.8)	1 (2.3)		
House officer (PGY 1) experience in Singapore					
Yes	67	63 (94)	4 (6)	0.388	0.571 (0.057–5.699)
No	10	9 (90)	1 (10)		
OBGYN medical officer experience prior to application to residency					
Yes	35	34 (97.1)	1 (2.9)	0.198	0.279 (0.030–2.624)
No	42	38 (90.5)	4 (9.5)		

OBGYN: Obstetrics and gynaecology, PGY: postgraduate year; ^astay group includes current residents and those who completed the 4-year ACGME-I OBGYN residency programme, ^battrition group includes only residents who have left the ACGME-I OBGYN residency programme prior to completion of training, ^cFisher exact test was used to calculate all p values except for those marked d, and ^dpaired t-test was used to calculate p value

There were 4 departures from 36 trainees (11.1%) in the BST-AST programme between 2002 and 2011. This accounted for an annual attrition rate of 3.5%. The difference in attrition between the residency and BST-AST programmes was not significant (OR 0.556, 95% CI 0.140–2.207). Demographic data for trainees in the BST-AST programme were unavailable from the hospital database.

Between 2011 and 2018, there were between 50 and 60 candidates applying to the OBGYN residency programme annually. This accounted for an annual ratio of resident intake to applicants of between 10 to 28.8%, with a mean of 22.2%.

DISCUSSION

Graduate medical education in Singapore underwent an overhaul between 2009 and 2012 from the British BST-AST model to the ACGME-I framework. OBGYN training is now a 4-year curriculum with graded, progressive responsibility, incorporating the ACGME-I's six core competencies and duty hour restrictions.³ While the residency format was adapted, some past requirements maintained such as entry into OBGYN residency no earlier than the second postgraduate year (PGY), and the

completion of two further Senior Resident training years after the 4-year programme and a final exit examination.^{4–6} SingHealth OBGYN trains over 80% of OBGYN residents in Singapore. Fourteen residents were enrolled in its first cohort in 2011. However, due to national medical manpower considerations, only 6 were enrolled in the 2018 cohort. With dwindling enrolment, attrition becomes more of concern, especially as more than 70% of programme applicants are rejected annually. Currently, attrition rates of OBGYN residents in Singapore appear lower than those in the United States and United Kingdom which both report attrition rates of 20%.^{7,8}

This study highlights the differences in characteristics of the “stay” and “attrition” groups. We observed that residents in the “attrition” group were younger than residents in the “stay” group. While not statistically significant, this may be due to lack of work experience prior to residency contributing to misinformed training expectations and increased attrition risk found in our earlier study.⁹ Other studies, however, found higher attrition rates in older residents who may have more family and lifestyle concerns.^{10,11} We advocate caution when proposing fast-tracking of medical students into specialist training as the anticipated quicker promotion during

residency may backfire and increase resident dissatisfaction and programme attrition.¹²

Next, all residents in our “attrition” group were female. Earlier reported studies have found that female residents were more likely to leave training for various reasons including child and family care.^{10,11,13,14} Women are important in medicine as they tend to have more empathy and better patient satisfaction scores than their male counterparts.^{15,16} Other reports found no association between female gender and attrition and that child rearing was not a risk factor for attrition in both men and women.¹⁷ Flexibility, open communication and accommodation with maternity and paternity leave may reduce burdens and attrition. We found that no male residents left training in our study. This may be attributed to the low numbers of male residents in our study (11 compared to 66 female residents) rather than a difference in attrition due to gender.

All residents in the “attrition” group were Singaporean in nationality. There were no departures of non-Singaporeans despite accounting for 19.5% of residents in this cohort. Retention rates appear high in international medical graduates for completion of specialty training, although there was a trend towards a higher rate of attrition in international medical graduates than in local graduates in our study.^{18,19} This finding has also been shown in other studies.^{20,21} This may be due to lifestyle changes and loss of self-esteem which might be demoralizing for international medical graduates coping with the demands of the residency programme.²² Retention rates also appear to fall post-training in rural locations.²³ Typically, push factors from their home country such as low wages, poor working conditions and poor promotion possibilities drive migration of doctors.²⁴ Singapore, far from rural, has the advantage in retaining migrant doctors who are motivated to make their move a success.

An earlier study which utilized thoughts of attrition as a proxy for risk of attrition found married OBGYN residents more likely to consider resignation from residency.⁹ However, in this study, unmarried residents were more likely to leave the programme. This mismatch between consideration (32.1%) and actual (6.5%) attrition highlights the need to better understand and address these decision-making processes. This gap may be partially explained by Viola et al’s study of general surgery residents where single, female residents were more likely to identify lifestyle over income as a motivator to specialty training.²⁵ Residents in our “attrition” group switched to careers in anaesthesiology, family medicine or aesthetic medicine, specialties that have traditionally been perceived to provide better lifestyle options than OBGYN.^{26,27} More research into decision-making processes of attrition may allow us to better support residents considering attrition and promote retention.

This study observed a 40% reduction in annual attrition rate between the BST-AST and ACGME-I programmes. It

is important to consider the differences that may have contributed to resident retention. While duty-hour limitations have not influenced voluntary attrition in general surgery residency programmes, the ACGME-I programme also brought to Singapore’s specialty training system a structured administrative and educational support team of programme executives with clear educational leadership, formal curriculum and assessment and regular audit through programme accreditation for quality assurance of postgraduate education for residents.²⁸ These features help residents have clearer expectations of themselves and the training programme, reducing mismatched expectations which influence job dissatisfaction.²⁹ Programme mismatch was cited as the leading cause of departure from training at SingHealth residency between 2010 and 2016.²

Limitations

This study has limitations. Firstly, despite inclusion of all residents from the ACGME-I SingHealth OBGYN programme since its initiation in 2011, the small study population is underpowered to detect statistical differences between groups. The lack of statistical differences in observable demographic data at the point of selection “stay” and “attrition” groups reminds us not to apply pre-conceived stereotypes about risk of attrition such as age, gender, marital status, nationality or experience. Such demographic data are often provided in application resumes, making this selection screening method vulnerable to hiring discrimination.³⁰ Resident selection committees must consciously take steps to avoid implicit bias. Decisions to quit specialty training are complex ones and cannot simply be calculated by a mathematical algorithm.

Secondly, no qualitative data was obtained, restricting further understanding of factors driving attrition. The retrospective nature of this study limits the availability of data from departmental databases, especially from the BST-AST programme when educational administration was less structured. Finally, findings from this study may not apply to residency programmes in different specialties or healthcare systems where different stressors exist.

CONCLUSION

Demographic data alone cannot predict risk of resident attrition as decisions to leave specialty training are complex ones. Introduction of the ACGME-I accredited residency programme appears to have reduced resident attrition rates. Further study is required to help faculty and administrators better identify and support residents at risk of attrition.

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