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Nurses graduating in Fiji between 2001 and 2010: sufficient supply for Fiji's health service demands?

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Setting: Fiji's schools of nursing and government health services, 2001–2010.

Objectives: To report on 1) the number and characteristics of nurses who graduated in Fiji, 2) the proportion of vacant nursing positions in the government health services and 3) attrition among nurses.

Design: Descriptive study involving a retrospective record review of Ministry of Health annual reports and nursing registers.

Results: Over the period 2001–2010, a total of 1500 nurses graduated, with the overall trend being a gradual increase in newly qualified nurses year on year. Available data from 2007 onwards showed relatively low vacancy rates (range 0.4–2%), with a sharp rise to 15% in 2009. Complete data on nurse attrition were available only from 2007 onwards, with rates of attrition ranging from 4% to 10%; the most common reason for attrition was resignation.

Conclusion: While it was unable to directly assess whether Fiji's supply of nursing graduates has been meeting the country's health service demands, this study provides a series of baseline data on Fiji's nurse graduate and nursing workforce. In addition, it identifies some of the challenges and gaps that need to be considered to better assess and address nursing staff shortages.

Human resources for current and future nursing workforces are critically low globally, and are in crisis in many low-income countries.¹ A key contributor to the crisis is nurse attrition, measured by the number of nurses who leave the workforce. Particular challenges in low-income countries are how to train, distribute and retain enough nurses, and how to deal with the migration of nurses to higher-income countries.^{1,2} Fiji has experienced similar challenges, in particular hospital nurse shortages and emigration of Fiji-trained nurses in search of better working and living conditions overseas.^{3–7} It is therefore important to explore the extent and nature of these shortages and the dynamics of nursing supply and demand in Fiji's health services. From a nursing school perspective, this could provide an indication of whether sufficient nurse graduates are being produced to meet Fiji's requirements, and help nurse educators optimise their strategies for training and preparing nurses for the workforce.

The Community Health Information Profiles of the World Health Organization (WHO) use total nurse graduates and total attrition as key human resource indicators.⁸ Other 'process' indicators such as vacancy rates are used to estimate nursing shortages.⁹ Conse-

quently, for the period from 2001 to 2010, this study set out to report on: 1) the number and characteristics of nurses who graduated in Fiji; 2) the proportion of vacant nursing positions in the Fiji government health services; and 3) attrition among nurses in Fiji.

METHODS

Design

Descriptive study involving a retrospective record review of the Fijian Ministry of Health (MoH) annual reports and nursing registers.

Setting and participants

Fiji consists of about 322 small islands in the South Pacific, of which 110 are inhabited. In Fiji, nursing is under the direct control of the MoH. Nurses form the largest group in Fiji's health workforce, comprising 64% of the total health workforce in 2011 and 57% of all persons employed by the MoH.⁷ The ratio of one nurse to 485 people, calculated in 2008, compares favourably with other Pacific Island countries, but is well below those in New Zealand and desirable internationally accepted levels.⁷

Fiji has two schools of nursing: the government-funded Fiji School of Nursing was established in 1893, merging with the Fiji School of Medicine in 2010 to form the College of Medicine, Nursing and Health Sciences under the new Fiji National University. Sangam Private Nursing School was established in Labasa in the Northern Division in 2005. It produced its first graduates in 2008, and has since been reported to have had 50–60 graduates absorbed each year into the government health services.⁷

In Fiji, the basic training programme for becoming a registered nurse is of 3 years' duration, after which the graduate has a nursing diploma. Newly graduating nurses from both schools need to be registered by the Nurses, Midwives and Nurse Practitioners Board before they can practise. A new Nursing Council and a College of Nursing have recently been formed in Fiji that regulates nurses' qualifications and ensures their ongoing fitness to practise. The MoH operates 103 nursing stations and 110 divisional and subdivisional hospitals. Nurse graduates are posted to these facilities by the MoH.

The present study included all Fijian nurses who graduated from either of Fiji's nursing schools between 2001 and 2010. Graduates from Pacific Island countries, who are mandated to return to their countries on graduation, were excluded.

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Data collection and analysis

Data were sourced from electronic versions of MoH annual reports¹⁰ and paper-based registers from the Fiji School of Nursing and the Nursing Division of the MoH. To examine annual numbers and characteristics of nurse graduates, the following variables were collected: the number of nurses graduating each year, and for each nurse, age, sex and ethnicity. To examine national data regarding annual filling of established nursing positions in the government health services, variables included number of established positions and number of positions filled and vacant. To examine national data regarding annual nurse attrition from the government health services, variables included the number of nurses lost each year and the reasons for loss. Where possible, data were cross-checked with WHO reports, which also draw on MoH and nursing school data.^{7,8}

Available data were collected into structured data sheets, and entered and analysed in Microsoft Excel (Microsoft, Redmond, WA, USA). Annual nurse attrition rates were calculated as number of nurses lost to attrition/number of filled nursing positions.

Ethics

Ethics approval was obtained from the Fiji National Health Research Ethics Committee and the Ethics Advisory Group of the International Union Against Tuberculosis and Lung Disease.

RESULTS

Characteristics of nursing graduates

Table 1 shows the characteristics of nursing graduates in Fiji between 2001 and 2010. Over this period, a total of 1500 nurses graduated. The majority were female (95%), the median age of nurses at the time of graduation was 22 years (interquartile range 22–24) and 51% were Fijian (Table 1). The overall trend shows a gradual annual increase in nursing graduates (apart from the anomaly noted in 2009). Nurses are graduating at

a younger age, which will be significantly beneficial in planning the workforce for the future, and shows that the younger generation is considering joining the workforce soon after high school. There was little variation in the age and sex distribution of graduates from one year to the next. In contrast, the ethnic distribution among graduates has changed, with a trend toward a general increase in the proportion of graduates of Indian ethnicity, particularly in more recent years (2007–2010).

Nursing staff positions, vacancies and attrition

Table 2 shows the distribution of established nursing positions, nursing vacancies and nursing attrition in Fiji between 2001 and 2010. The number of nurses who graduated from both nursing schools filled the positions, leaving fewer vacancies to be filled from 2001 to 2010. The total number of established nursing positions between 2001 and 2010 increased, indicating an increase in demand for graduating nurses in Fiji. In 2005, due to an increase in demand, the number of filled positions ($n = 1857$) exceeded the number of established positions ($n = 1750$). In the following years (2006–2010), a greater number of positions were established, thereby increasing the chances of work for graduating nurses.

Data on nursing vacancies were incomplete. Available data from 2007 onwards showed relatively low vacancy rates (ranging from 0.4% to 2%), apart from a sharp rise to 15% observed in 2009 (Table 2). This sudden annual rise in vacancies occurred at the same time that the number of established positions dramatically increased, with 170 additional positions established in 2009 compared with 2008.

Complete data on nurse attrition were only available from 2007 onwards, with yearly rates of attrition ranging from 4% to 10% (2007–2010; Table 2). Resignations tended to be the most common reason for this attrition, apart from in 2009 when two thirds of the attrition rate was due to retirement. Based on available data from 2006 onwards, the annual number of graduate

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TABLE 1 Number and characteristics of nurse graduates in Fiji, 2001–2010

Graduation year	2001 <i>n</i> (%)	2002 <i>n</i> (%)	2003 <i>n</i> (%)	2004 <i>n</i> (%)	2005 <i>n</i> (%)	2006 <i>n</i> (%)	2007 <i>n</i> (%)	2008 <i>n</i> (%)	2009 <i>n</i> (%)	2010 <i>n</i> (%)	Total <i>n</i> (%)
Total	130	131	150	141	162	206	176	204*	9*	191	1500
Age, years											
20–24	111 (85)	109 (83)	123 (82)	118 (84)	121 (75)	167 (81)	140 (80)	170 (83)	4 (44)	171 (90)	1234 (82)
25–29	16 (12)	17 (13)	22 (15)	21 (15)	37 (23)	23 (11)	28 (16)	30 (15)	5 (56)	19 (10)	218 (15)
30–45	3 (2)	5 (4)	5 (3)	2 (1)	4 (2)	9 (4)	1 (1)	4 (2)	0	1 (0.5)	34 (2)
Not recorded	0	0	0	0	0	7 (3)	7 (4)	0	0	0	14 (1)
Median[IQR]	23[22–24]	23[22–24]	23[22–24]	23[22–24]	23[22–25]	23[22–24]	23[22–24]	23[22–24]	25[23–26]	22[22–23]	23[22–24]
Sex											
Male	9 (7)	4 (3)	13 (9)	3 (2)	14 (9)	5 (2)	6 (3)	16 (8)	2 (22)	10 (5)	82 (5)
Female	121 (93)	127 (97)	137 (91)	138 (98)	148 (91)	201 (98)	170 (97)	188 (92)	7 (78)	181 (95)	1418 (95)
Ethnicity											
Fijian	98 (75)	87 (66)	79 (53)	76 (54)	94 (58)	114 (55)	89 (51)	54 (26)	6 (67)	61 (32)	758 (51)
Indian	28 (22)	42 (32)	65 (43)	60 (43)	60 (37)	83 (40)	83 (47)	135 (66)	3 (33)	124 (65)	683 (46)
Other	4 (3)	2 (2)	6 (4)	5 (4)	8 (5)	9 (4)	4 (2)	15 (7)	0	6 (3)	59 (4)

*The very small number of graduates in 2009 is due to the fact that the 2006 intake of students (who would normally have graduated in 2009) graduated early in December 2008. Only those who re-sat their examinations after failing in 2008 graduated in 2009. The number of graduates in 2008, however, only reflects the 2006 student intake, as no student intake took place in 2005 due to a curriculum changeover.
IQR = interquartile range.

TABLE 2 Proportion of vacant nursing positions and nursing attrition in Fiji, 2001–2010*

	2001 <i>n</i> (%)	2002 <i>n</i> (%)	2003 <i>n</i> (%)	2004 <i>n</i> (%)	2005 <i>n</i> (%)	2006 <i>n</i> (%)	2007 <i>n</i> (%)	2008 <i>n</i> (%)	2009 <i>n</i> (%)	2010 <i>n</i> (%)
Established nurse positions	1742	1640	1659	NA	1750	NA	1827	1811	1981	1901
Filled	NA	NA	NA	NA	1857 (106)	NA	1820 (99.6)	1784 (99)	1691 (85)	1861 (98)
Vacant	NA	NA	NA	NA	NA	51	7 (0.4)	27 (1)	290 (15)	40 (2)
Nurse attrition (% of total nurses) [†]	137 [‡]	NA	NA	NA	NA	34	82 (5)	121 (7)	165 (10)	76 (4)
Resignation	Not used	93 [§]	53 [§]	46 [§]	99 [§]	28 (82)	53 (62)	78 (64)	40 (24)	50 (66)
Retirement	3 (2)	NA	NA	NA	NA	3 (9)	12 (15)	21 (17)	112 (68)	11 (14)
Deemed to have resigned	Not used	NA	NA	NA	NA	Not used	10 (12)	18 (15)	10 (6)	13 (17)
Deceased	2 (1)	NA	NA	NA	NA	3 (9)	7 (9)	4 (3)	3 (2)	2 (3)
Nurse graduates	130	131	150	141	162	206	176	204	9 [¶]	191

*Data from Fiji Ministry of Health annual reports, unless otherwise specified.

[†]Calculated as number of nurses lost to attrition/number of filled nursing positions.

[‡]Includes 133 reassigned (assigned to non-nursing positions in health services).

[§]Data from WHO Fiji Islands Health System Profile, where category included retirement.⁸

[¶]The very small number of graduates in 2009 is due to the fact that the 2006 intake of students (who would normally have graduated in 2009) graduated early in December 2008. Only those who re-sat their examinations after failing in 2008 graduated in 2009.

NA = no data available; WHO = World Health Organization.

nurses entering the health system generally exceeded the number of nurses lost to attrition each year (apart from 2009, when the anomaly was observed).

DISCUSSION

This study from Fiji set out to assess whether the supply of nursing graduates adequately meets Fiji's health service demands, using commonly reported key human resource indicators. Our findings show that the number of nurse graduates has gradually increased in the last 10 years, that vacancy rates for nurse positions since 2007 have been relatively low (0.4–2%) and that yearly rates of attrition ranged from 4% to 10% between 2007 and 2010.

First, the gradual increase in the number of nurses graduating over the last 10 years is positive. This is likely due to the establishment of a second nursing school in Fiji in 2005, together with the offer of additional places at the Fiji School of Nursing. However, data on the number of individuals with nursing qualifications do not alone reflect the number actually entering the nursing workforce. Without examining information on attrition that occurs between graduation and registration and between registration and entry into the active workforce, we cannot ascertain the actual supply of newly trained nurses. Some nurse graduates may move into the private sector, while others may emigrate, and it is important to report and monitor such data.

Information obtained by interview to evaluate how nursing graduates search for nursing positions in Fiji, and how they are recruited, may enable more effective recruitment strategies to be devised. The gradual increase in the number of nurses graduating over the last 10 years mirrors the trend towards more established nursing positions over the same period, reflecting an increase in demand from the health sector and expansion of health care services.

Second, the increased proportion of graduates of Indian ethnicity in the last few years reflects the large proportion of students of Indian ethnicity enrolled at the Sangam Private Nursing School, an Indian-owned nursing school that opened in 2005 and produced its first graduates in 2008.

As in many countries, the majority of nursing graduates in Fiji are young female school leavers. While this is not a problem per se, efforts to broaden the recruitment base could include trying to recruit more males and mature entrants.

Although complete data on filled and vacant nursing staff

positions were available only from 2007 onwards, vacancy rates tended to be quite low during these years. The sudden fluctuation in 2009 is probably due to the introduction of a decree that reduced retirement age for civil servants from 60 to 55 years, making it mandatory for nurses aged >55 years to retire by the end of the year. The difficulty in interpreting these vacancy rates, however, is that no single threshold has been set to indicate whether or not a shortage existed. Furthermore, there is a concern that vacancy rates may underestimate the extent of staff shortages, with total budgeted positions reflecting the financial constraints of a health service rather than actual nursing staff needs.^{11,12} Nevertheless, while single year measures of vacancy rates may be uninformative, trends over time can at least provide some indication of relative changes in the balance between supply and demand of nursing staff. In addition to data on overall vacancy rates, it is important to understand more about the nature of these vacant positions: type of position, type of health facility, their geographical distribution and whether they are short- or long-term vacancies. Such information would help inform targeted strategies to better retain and recruit nurses and better address maldistribution issues, both geographical and across nursing positions and health care disciplines. Measures such as the number of patients attended per day, nursing time per patient or total nurse hours per day may serve as better indicators for ascertaining real nursing necessities and shortages.

The data on attrition allowed us to examine trends only from 2006. Attrition rates among nurses were relatively high. As mentioned earlier, the high attrition rate of 10% in 2009 is explained by the lowering of the retirement age. Apart from 2009, however, attrition in other years has also been reported to be due primarily to resignations. Emigration of nurses out of the country has been cited as one of the main reasons for nurses leaving Fiji's workforce.^{3–7} However, qualitative research is needed to further explore these reasons, and to examine which geographical regions, facilities, disciplines and positions are losing nurses. Such information would help to inform retention strategies and to prioritise resources towards those areas deemed most important for retaining nurses (e.g., higher salaries, better working conditions, enhanced career opportunities).

This study highlights the need for effective compilation and management of human resource data. Dedicated personnel need to be given the responsibility for ensuring that data are complete, reliable and reported in a standardised format and for ensuring

that there is consistency between different data sources (e.g., nursing school data and MoH data). This responsibility needs to be assumed by all the institutions involved.

There are a number of study limitations. First, reliance on the key indicators used limits our ability to explicitly determine whether Fiji's supply of nurse graduates has been sufficient for the health service requirements. Second, validation of available data was often not possible due to variations in definitions and reporting between different data sources and some lost registers. Third, incomplete data on nursing positions and nurse attrition in earlier years meant that trends over the whole of the 10-year study period could not be examined. Fourth, there are inherent limitations to using established nursing positions alone as a proxy indicator for Fiji's nursing requirements. Despite these limitations, the study findings, and the limitations themselves, raise a number of important points for discussion.

Finally, the process of evaluating and addressing nursing shortages is complex, made even more so by the facts that 1) there is no universal definition of 'nursing shortage', and as such confusion often exists in terms of what is actually meant by the term, 2) there are inherent difficulties in measuring nursing shortages, with no single global indicator to measure their extent and nature, 3) perceived shortages are not just a problem of supply and insufficient nurse numbers: on the demand side, efforts to ensure more effective utilisation of available nursing resources can also help to address the 'shortages', and 4) nursing shortages are essentially a product of broader health system issues, and cannot be solved in isolation.¹³

CONCLUSION

Although it is unable to directly assess whether Fiji's supply of nursing graduates has been meeting the country's health service

demands, this study provides a series of baseline data on Fiji's nurse graduate and nursing workforce, and identifies some of the challenges and gaps that need to be considered to better assess and address nursing staff shortages.

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Contexte : Les écoles d'infirmiers et les services de santé gouvernementaux des Iles Fiji, 2001–2010.

Objectifs : Signaler 1) le nombre et les caractéristiques des infirmières diplômées aux Iles Fiji, 2) la proportion de postes vacants d'infirmières dans les services de santé gouvernementaux et 3) les taux de perte parmi les infirmières.

Schéma : Etude descriptive comportant une révision rétrospective des rapports annuels du Ministère de la Santé et des registres d'infirmiers.

Résultats : Au cours de la période 2001–2010, au total, 1500 infirmières ont été diplômées et il existe d'année en année une tendance globale vers un accroissement graduel des infirmières récemment diplômées. Les données disponibles à partir de 2007 ont montré des taux relativement faibles de postes vacants (allant de 0,4% à 2%),

avec une augmentation brutale vers 15% en 2009. Les données complètes concernant les pertes de personnel infirmier ne sont disponibles que depuis 2007 ; les taux de perte vont de 4% à 10%, la raison principale en étant la démission.

Conclusion : Tout en n'étant pas en mesure d'évaluer directement dans quelle mesure l'apport d'infirmières diplômées a répondu aux besoins des services de santé du pays, cette étude fournit un ensemble de données de départ sur les infirmières diplômées et sur la main d'œuvre d'infirmiers des Iles Fiji. En outre, elle identifie quelques-uns des défis et des déficiences qui doivent être pris en considération pour mieux évaluer et mieux répondre aux insuffisances de personnel infirmier.

Marco de referencia: Las facultades de enfermería y los servicios gubernamentales de salud de Fiji entre el 2001 y el 2010.

Objetivos: Notificar los siguientes datos: 1) el número y las características de las personas que se graduaron de las escuelas de enfermería en Fiji, 2) la proporción de puestos de enfermería vacantes en los servicios gubernamentales de salud y 3) el índice de deserción en el personal de enfermería.

Método: Fue este un estudio descriptivo, en el cual se practicó un análisis retrospectivo de los registros anuales del Ministerio de Salud y los registros el personal de enfermería.

Resultados: Durante el período entre el 2001 y el 2010 se graduaron 1500 personas en las facultades de enfermería y se observó una tendencia general al aumento de los enfermeros recién diplomados cada

año. Los datos existentes a partir del 2007 indican tasas relativamente bajas de puestos vacantes (entre 0,4% y 2%), con un aumento notable a 15% en el 2009. Solo se contó con datos completos sobre la deserción del personal de enfermería a partir del 2007, los cuales indicaron tasas de abandono entre el 4% y el 10%; la razón más frecuente de la deserción fue la renuncia al cargo.

Conclusión: Aunque no se pudo establecer de manera directa si la provisión de enfermeros graduados en Fiji ha abastecido la demanda de los servicios de salud del país, el presente estudio aporta una serie de datos de referencia sobre las personas diplomadas en enfermería y la fuerza laboral en esta disciplina. Además, el estudio define algunas de las dificultades y las deficiencias que se deben tener en cuenta a fin de responder mejor a la escasez de personal de enfermería.