The changing skill mix in nursing: considerations for and against different levels of nurse

ELISABETH R. JACOB MEd, GradDipCritCare, DipAppSciNsg, RN, MRCNA[1], LISA MCKENNA PhD, MEdSt, GradDipHealthAdmin&InfoSys, RN, RM, MRCNA[2] and ANGELO D'AMORE PhD, GradCertHealthProm, BSc (Hons), BSc[3]

[1]PhD candidate and Lecturer, *School of Nursing and Midwifery, Monash University, Gippsland, Victoria*,[2]Professor, *School of Nursing and Midwifery, Monash University, Clayton, Victoria and* [3]Senior Lecturer, *Department of Rural and Indigenous Health, Monash University, Moe, Victoria, Australia*

Correspondence
Elisabeth R. Jacob
School of Nursing and Midwifery
Monash University
Gippsland
Victoria 3842
Australia
E-mail:
Elisabeth.jacob@monash.edu

JACOB E.R., MCKENNA L. & D'AMORE A. (2013) *Journal of Nursing Management*

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Aim To investigate the current literature to gain an understanding of skill mix, why it is being manipulated and how it affects patient care and health-care costs.
Background Due to workforce shortages, economic constraints and increasing patient acuity, employers are looking at methods of providing patient care whilst maintaining costs. Registered nurses make up a large percentage of the health-care budget. The manipulation of skill mix (i.e. the percentage of registered nurses available for patient care) is seen as one method of managing the increasing cost whilst still ensuring patient care.
Evaluation Research literature was used to determine the current use of skill mix and its impact on patient care and health-care costs.
Key issue The use of a higher proportion of registered nurses is associated with better health outcomes, shorter length of stay and reduced patient morbidity.
Conclusion Economic savings from substituting registered nurses with other health professionals may be offset by increased patient length of stay in hospital and increased patient mortality.
Implications for nursing management When evaluating nursing skill mix, a higher percentage of registered nurses may result in health-care facility cost savings by providing a shorter length of stay and decreased patient complications.

Keywords: economic factors, levels of nurse, scope of practise, skill mix, workforce

Accepted for publication: 3 July 2013

Background

Economic constraints, workforce shortages and increasing acuity of patients are common throughout the Western world. Governments and employers have been seeking clarity in the defined roles for health-care workers to ensure the most appropriate and cost effective skill mix whilst maintaining quality of care (Canadian Nurses Association 1993, Ayre *et al.* 2007, Yang *et al.* 2012). Changes in the Australian health care environment have also resulted in the need to re-examine the roles of all health-care workers. This need is, in part, related to the necessity for the Australian health-care system to meet the demands of financial constraints, increased patient acuity levels and shortage of nursing and other health care professionals (Milson-Hawke & Higgins 2003, Gibson & Heartfield 2005, Conway 2007, Nankervis *et al.* 2008).

Nurses constitute the largest group of health-care workers in many countries and in Australia comprise the largest single group of employees and hence a large proportion of health care costs (Milson-Hawke

DOI: 10.1111/jonm.12162

& Higgins 2003, Nankervis *et al.* 2008, Goryakin *et al.* 2011). Changes to the nursing skill mix to employ second level nurses (nurses qualified and practising at a level lower than a registered nurse (RN) such as enrolled nurses or licenced practise nurses who are supervised by RNs) and unregulated health professionals as assistants to RNs have been seen as solutions to both escalating health-care costs and shortages of RNs (McIntosh & Smith 2012). This commentary paper examines arguments for and against the manipulation of nursing skill mix to aid in addressing the nursing workforce shortage and rising health-care costs. The three key issues presented in this commentary paper have been identified from the literature and are areas that should be taken into consideration when proposing or debating changes to the skill mix in addressing workforce shortages.

Evaluation

Definition of skill mix

Nursing skill mix constitutes the proportions of different levels of nurse, including the level of qualifications, expertise and experience, available for patient care during a nursing shift. According to Duffield *et al.* (2006), skill mix is the adjustable component of the health-care sector human resources used to achieve the most flexible and cost effective use of available health care personnel. It has been defined as 'the proportion of registered nurses' (Duffield *et al.* 2007 p. 9), as nursing care was originally only given by RNs. Internationally, there are significant differences in skill mix configurations and models of care.

Configurations of nursing skill mix teams differ based on the country in which they are employed and the acuity of the patient. They can range from entirely RNs to combinations of registered and second level nurses [enrolled nurse (EN) in the UK and Australia and licenced practical nurse (LPN) in the USA] or other categories of unlicensed health-care workers (UHW), such as personal care attendants or nursing assistants as used in Australia and the UK (Duffield *et al.* 2006, Ayre *et al.* 2007, Goryakin *et al.* 2011). According to Flynn and McKeown (2009) no staffing or skill mix model has been developed for nursing that addresses all variables that impact on the nursing workload. It is suggested that this lack of a consistent model may be, in part, due to the subjectivity of some aspects of nursing care that are based on professional judgements of patient acuity and patient nursing requirements. A deficiency in empirical evidence for determining the correct skill mix for each situation makes decision making for the implementation of appropriate skill mix difficult (Ayre *et al.* 2007, Yang *et al.* 2012). Despite attempts to develop information systems that can measure and define patient acuity and calculate nursing skill mix requirements, mixed results have shown variability in their applicability to different work environments and the ability to enable better management of workforce issues and provide data which can be used to help manage workforce supply and demand.

The skill mix solution

The role of each level of health-care worker is to provide patient care. Economic considerations, workforce shortages and diversity in interpreting how different levels of nurse affect the quality of patient care, have led to variations in configuration of the nursing workforce in many countries (Ayre *et al.* 2007). Whilst countries such as Australia, Canada and USA have maintained a two tiered system with RNs and ENs, other countries such as the United Kingdom have chosen to phase out the use of ENs, utilise only one level of nurse and increase the use of unregulated health-care workers as support staff for RNs (Heartfield & Gibson 2005). Adjustments to skill mix are seen to be one means of maintaining care for patients in a background of nursing shortages, whilst controlling the expanding cost of health care (Duffield *et al.* 2006). Staff configuration may vary depending on the availability of staff, economic considerations and the different specialty needs of patients. For example, skill mix in high acuity areas such as emergency and intensive care departments has traditionally required higher numbers of RNs to deal with the increased risk of patient morbidity and mortality associated with these areas. Changes in the roles of any of the group will result in reflective change in the roles of the other levels (Ayre *et al.* 2007). Decisions on how appropriately to mix skills appear to be dependent on three main issues: economic considerations, workforce shortages and quality issues.

Economic issues

The cost of health care has risen in conjunction with increased acute patient numbers, an ageing population and technology use. In an effort to curb increasing costs, employers have examined the nursing workforce, which constitutes the largest cost component of the workforce, in an effort to reign in expenses (Goryakin *et al.* 2011). Nursing care was originally undertaken solely by RNs. Enrolled nurses were

introduced in many countries as assistants to RNs in response to rising costs and the decreased availability of RNs (Russell 1990, Webb 1999). Before phasing out the role of ENs in the 1990s, they were originally introduced into the workforce in the UK because they were cheaper to employ than the more expensive RNs (Brown 1994). Enrolled nurses have since been replaced by less costly UHWs in the UK (McIntosh & Smith 2012). Arguments for the need to have a differing nursing skill mix appear to be based largely on economic factors with some authors suggesting that degree trained RNs may become too expensive, resulting in other workers taking up more of the traditional nurse's role (Francis & Humphreys 1999). This financial driver for changes in skill mix is supported by Duffield *et al.* (2006) who suggest that finance is the most prevalent influence on skill mix since RNs are seen as costly rather than cost-effective. Francis and Humphreys (1999) further suggest that the UK government accepted the upgrading of RNs to university status, and the phasing out of ENs, because the project included the introduction of a new, cheaper employee, the unskilled health worker, to make up for the price increase in employing RNs.

Economic factors have resulted in extensions to the roles of RNs and ENs and the development of newer roles such as nurse practitioners in the USA, UK and Australia (Chang & Twinn 1995). The changing scope of practise for different levels of nurse is driven by economic imperatives rather than professional needs (Chang & Twinn 1995, Goryakin *et al.* 2011). As ENs are substantially cheaper to employ than RNs, there is strong support by employers in Australia to both maintain and extend their role (Francis & Humphreys 1999, Blay & Donoghue 2006). This is demonstrated in figures from the state of Victoria, Australia, which have shown that whilst extended roles for ENs saw 33.6% of them undertaking medication endorsement by 2009, only 0.06% of RNs saw a corresponding increase in movement to nurse practitioner roles (Nurses Board of Victoria 2010a,b). The current drive in Australia to enhancing the scope of practise for ENs to undertake roles even closer aligned to those of RNs has created concern from RNs and others, fuelling a debate on whether health care is being controlled by economic factors rather than quality of care. Heartfield and Gibson (2005) imply that the future of ENs will be determined by market forces in Australia, regardless of legislation or professional decisions. This is supported by a study of Australian nurses by Buchanan and Considine (2002) who found that nurses believed their work was valued by management on the basis of efficiency and cost saving rather than quality of patient care.

Economic imperatives in Australia have resulted in changes to the configuration of nursing with, not only introduction of ENs into areas previously staffed solely by RNs, but also an increase in cheaper UHWs employed in the industry to undertake tasks traditionally assigned to ENs (Bellchambers & McMillan 2007). According to Heartfield and Gibson (2005), the increased use of UHWs is consistent with a worldwide trend driven by economics to reconfigure the health workforce.

Quality of patient care

There is increasing evidence linking nursing skill mix with patient outcomes in both mortality and adverse patient events (Aitken *et al.* 2002, Lankshear *et al.* 2005, Needleman *et al.* 2006, Duffield *et al.* 2007, Massey *et al.* 2008). Needleman *et al.* (2006) found that the greater the number of RNs, the fewer the number of patient complications. They suggested that direct cost savings for health services could be made by reducing adverse outcomes. Duffield *et al.* (2007 p. 9) determined that the proportion of RNs on a ward was 'more critical to patient outcomes than hours of nursing provided'. This may explain why experience and theoretical knowledge have also been linked with optimal patient outcomes (Tschannen & Kalisch 2009). Higher skilled and experienced nurses have been shown to undertake continual patient assessment and to communicate patient status to other health professionals, enabling the earlier detection of potential problems and earlier discharge times for patients (Tschannen & Kalisch 2009, Esparza *et al.* 2012).

Skill mix has also been found significantly to affect the occurrence of medication errors according to a USA study by Patrician and Brosch (2009), which found a decrease of 86% chance of medication errors occurring for every 10% increase of RNs in the skill mix. Ayre *et al.* (2007) argues that if RNs are removed from routine patient care through a diluting of the nursing skill mix, there is a higher possibility of critical changes in patients' conditions being missed. This is supported by a study by Needleman *et al.* (2006) who determined that greater use of RNs, rather than ENs, results in decreased adverse events and shorter length of stays, which partially offsets the increased cost of employing higher qualified staff. Milson-Hawke and Higgins (2003) argue that the most economic and effective health care delivery is achieved through high numbers of qualified staff, with RNs comprising the majority of nursing staff in acute

care settings. This may be in part due to the RN's focus on the patient and belief that nursing activities should originate from patient needs and not from tasks, rules or routines (Segesten *et al.* 1998).

Whilst RNs and ENs work in a regulated framework in Australia, UHWs are unregulated and have no education requirements (Heath 2002). Because UHWs are unregulated, there is no control over employment or quality of work. The increased use of UHWs to replace ENs in the workforce (McIntosh & Smith 2012) appears to be putting economic imperatives ahead of quality of care issues. UHWs are undertaking complex nursing tasks, which arguably should only be performed by nurses, risking quality of patient care (Francis & Humphreys 1999, Queensland Nurses Union 2011). Quality patient care demands lifelong learning from all health professionals (Jones & Cheek 2003) and UHWs not only have minimal skills and knowledge in patient care and assessment, they have no requirements to maintain or improve their knowledge. As UHWs are an unregulated group, control of their roles is up to the individual employer who may utilise them to replace nurses in the workforce due to pressure to minimise costs (Francis & Humphreys 1999). One suggested solution to this problem is to regulate the training and scope of practise of UHWs (Francis & Humphreys 1999, Beadnell 2012), which may require including them as a third level nurse (a nurse registered to practise at a level lower than a registered or enrolled nurse).

Workforce shortages

A review of nurse education in Australia by Heath (2002) found that nurses would need to change the way they practise in terms of becoming more flexible, adaptable and prepared to delegate roles to keep up with the changing roles of nurses and to change to address workforce shortfalls. Chaboyer *et al.* (2008) suggests that a predicted increase in the shortage of RNs is the driving force increasing the scope of practise for ENs, resulting in role ambiguity and a blurring of role boundaries. This is supported by Duffield *et al.* (2006) who argue that downsizing of organisations and shortages of qualified nurse have led to 'multiskilling' and encouraged less skilled workers to take on routine tasks traditionally undertaken by RNs. Preston (2009) proposes that expanding the roles of either level of nurse into areas currently not their domain will further exacerbate workforce shortages of nurses. Carrigan (2009) suggests that workforce shortage is one of the main drivers for an increase in UHWs. Whilst there are differences in nursing workforce configurations throughout the world, difficulties in determining and measuring what nurses actually do make it difficult to determine the most appropriate configuration (Heath 2002, Ayre *et al.* 2007). Although requirements for skill mix ratios have been stipulated in California, no distinction is made between RNs and LPNs, although they stipulate a maximum use of 50% LPNs in achieving set ratios (Donaldson *et al.* 2005). Although Ringerman and Ventura (2000) found that 55% of RN tasks could be delegated to trained ENs, their study resulted in decreasing RN work satisfaction, which could potentially lead to RNs leaving the profession and hence worsen the shortfall of available RNs, the major reason cited for increasing use of ENs. Preston (2009) concludes that whilst redesigning the workforce and extending the roles of different health professionals may result in improvements in efficiency, quality of care and professional satisfaction, it appears to have little short-term effect on nursing shortages. Retention of RN in the workforce has been linked to skill mix (Goryakin *et al.* 2011, Staggs & Dunton 2012). Issues have arisen in both the UK and Australia from the introduction of UHWs, despite a difference in workforce configurations. As UHWs are involved in the 'care-giving' role, traditionally undertaken by nurses, professional autonomy is being encroached upon by non-nurses (Francis & Humphreys 1999). Boundaries of care are not well delineated for either level of nurse and, even less so, for the UHW. Ayre *et al.* (2007) suggest that UHW roles have shifted from being 'complementary to' nurses to one of 'substitution for' nurses.

Another problem that has arisen due to the change in skill mix in acute care areas is that graduate nurses are not able to be employed in health services as there are not enough RNs on the staff to preceptor them (May 2010). According to May (2010), despite the predicted nursing shortage in Australia and corresponding increase in university placements for nurses, it is expected that thousands of newly graduated RNs in Australia will be unable to gain employment due to a lack of experienced preceptors to supervise them and economic constraints curtailing the health care sector in favour of cheaper options.

Implications for nursing management

Manipulation of skill mix has become an important nursing management tool to maintain health care costs and to manage workforce shortages. The focus of skill mix needs to change from looking purely at

the cost of nursing staff, to assessing the cost of the total patient care episode. Managers using skill mix must also take account of the impact on RNs in working with a more junior skill mix, the responsibility of health services to assist in the education of RNs for the future and the implications for quality of patient care. Whilst maintaining costs is vital, this leads to a vicious cycle where the use of a decreased skill mix exacerbates workforce shortages of RNs, as it decreases placement opportunities for student RNs and hence future workforce availability, and ultimately increases pressure on the RNs currently practising, thereby decreasing work satisfaction and hence retention. To the contrary, a higher percentage of RNs may result in health-care cost savings by decreasing both the length of patient stay and patient complications. In addition, this would provide increased opportunity for supervision of student RNs for future practise, thereby increasing the workforce available for care.

Conclusion

A shortage of RNs is seen as the main reason for employing ENs and UHWs in skill mix numbers. The assumption in changing skill mixes is that if ENs and UHWs undertake lower level duties, RNs will have more time to meet higher level patient needs, resulting in improved quality of care at lower cost. Changes in skill mix need to be balanced with quality care, as if increasing the skill mix produces better outcomes for patients, there are compelling reasons for health care systems to consider configurations that use higher numbers of RNs rather than cheaper alternatives. Whilst it is cheaper for health services to employ ENs and UHW, the reduction in the length of hospital stay and decreased patient complication rates found when employing greater numbers of RNs negates the financial argument for employing cheaper staff to undertake the 'simpler' tasks. The increase in the use of ENs and UHW to undertake traditional nursing roles has led to a blurring of the roles of each health-care worker, making individual roles difficult to delineate. However, skill mix is a broad phenomenon and current studies have not addressed interactions between different levels of nurses, how differences in educational preparation affect clinical competencies and problem solving skills, and the effect of the different levels of nurse. Without taking into account the individual characteristics of nurses and differences in work environments, it is very difficult to assume a one size fits all approach to nursing.

Source of funding

There is no financial interest or sources of outside support utilised by the authors in the writing of this paper.

Ethical approval

Ethical approval was not required for this paper.

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