December 2014 - February 2015
Volume 32 Number 2

AJAN

australian journal of advanced nursing

An international peer reviewed journal of nursing research and practice

32:2

IN THIS ISSUE

THE AUSTRALIAN JOURNAL OF ADVANCED NURSING

The Australian Journal of Advanced Nursing aims to provide a vehicle for nurses to publish original research and scholarly papers about all areas of nursing. Papers will develop, enhance, or critique nursing knowledge and provide practitioners, scholars and administrators with well-tested debate.

The AJAN will:

- publish original research on all nursing topics
- publish original scholarly articles on all nursing topics
- process manuscripts efficiently
- encourage evidence-based practice with the aim of increasing the quality of nursing care
- provide an environment to help authors to develop their research and writing skills
- provide an environment for nurses to participate in peer review

Publisher and Editorial Office
Australian Nursing and Midwifery Federation
PO Box 4239
Kingston ACT, Australia 2604
tel +61 2 6232 6533
fax +61 2 6232 6610
email: ajan@anmf.org.au
http://www.ajan.com.au

ISSN 1447-4328

Indexing
The AJAN is indexed in the CINAHL (Cumulative Index to Nursing and Allied Health Literature) Database, Current Contents, International Nursing Index, UnCover, University Microfilms, British Nursing Index, Medline, Australasian Medical Index and TOC Premier.

PRODUCTION

Editor
Lee Thomas

Journal Administrator
Anne Willsher

EDITORIAL ADVISORY BOARD

AJAN
australian journal of advanced nursing

December 2014 - February 2015
Volume 32 Number 2

CONTENTS

RESEARCH PAPERS

SCHOLARLY PAPERS

AUSTRALIAN JOURNAL OF ADVANCED NURSING REVIEW PANEL: AUSTRALIA

AUSTRALIAN JOURNAL OF ADVANCED NURSING REVIEW PANEL: INTERNATIONAL

Professional capability within the Australian hyperbaric nursing workforce

AUTHORS

Carol Baines
RN, Clinical Nurse,
Department of Diving and Hyperbaric Medicine, Royal Hobart Hospital, GPO Box 1061, Hobart, Tasmania, Australia
carol.baines@dhhs.tas.gov.au

Pam Sykes
RN, BN
Clinical Nurse Educator, Practice Development Unit, Royal Hobart Hospital, GPO Box 1061, Hobart, Tasmania, Australia
pam.sykes@dhhs.tas.gov.au

Acknowledgements
Jo James, RN; Members of the Hyperbaric Technician Nurses Association

KEY WORDS

registered nurses, hyperbaric, workforce, emotional intelligence, survey

ABSTRACT

Objective
To document and describe a contemporary profile of the Australian hyperbaric nursing workforce.

Design
A mixed methods research methodology using a web-based survey questionnaire.

Setting
Members of the Australian Hyperbaric Technicians and Nurses Association.

Main outcome measures
Overview of the current Australian hyperbaric nursing workforce including demographics, education, clinical experience, employment status and workplace health and safety requirements.

Results
A majority of the 49 respondents working in the specialty of hyperbaric medicine were female (87.7%) and aged between 45-54 years (42.9%). All have qualifications relevant to hyperbaric, wound management and/or critical care nursing. A mostly part-time and casual workforce (75.5%) participates in an on call roster between one and five times per fortnight (81.6%). Hyperbaric nurses (95.4%) have been recruited from critical and emergency care departments with many continuing to work shifts in these areas. A high level of workplace health and safety compliance includes an annual medical examination (91.8%) and associated hearing test (77.6%). Personal injuries associated with hyperbaric oxygen therapy are low.

Conclusion
Limited data are available on the characteristics of the hyperbaric nursing workforce in Australia. Results of this survey show the recruitment and retention of female nurses' in the middle of their career ensures a high level of job suitability. Advanced clinical skills coupled with relevant post graduate tertiary qualifications are necessary. A high level of casual workforce employees ensures the mandatory 18 hour break between compression treatments is achievable. The emphasis on workplace health and safety compliance is paramount with few injuries being reported.

INTRODUCTION

The field of Diving and Hyperbaric Medicine has many idiosyncrasies. It is a unique field of nursing that is physically, emotionally and environmentally challenging. The hyperbaric specialty is growing with an increasing number of medical conditions being accepted as responders to hyperbaric oxygen therapy. Recruiting registered nurses to the hyperbaric environment can present its own difficulties. The hyperbaric nurse must possess all the skills required to care for patients with varying levels of sickness from outpatient to critically ill whilst working independently inside the actual hyperbaric chamber. The physical environment of the hyperbaric facility is highly regulated requiring strict compliance with various treatment tables and is potentially volatile due to the delivery of 100% oxygen in a confined space, consequently, specific technical knowledge and skills are mandatory. In addition, nurses must demonstrate an advanced level of emotional intelligence that alludes to an outward serene demeanour whilst knowing they are solely responsible for facilitating patient care for the two or more hours the chamber is compressed (Gray 2008).

Hyperbaric Medicine is not a new specialty but it is a field of nursing that is not well known. There are fifteen Departments of Diving and Hyperbaric Medicine (hyperbaric facilities) in Australia: eight in major public hospitals in each State and the Northern Territory, five in private facilities and two in military facilities (Frawley et al 2013). A hyperbaric facility often has one large multi-place chamber and several mono-place chambers. They usually operate during office hours but provide an 'on call' service to their catchment area. This design of service delivery is echoed around Australia and documented by Uzun et al (2011) as being an appropriate format.

Several professional groups work harmoniously in a hyperbaric facility: doctors, registered nurses (RNs) and technicians. All members are key to providing safe hyperbaric oxygen therapy (HBOT) that is supported and underpinned by the following regulatory authorities; Australian/New Zealand Standard™ Occupational diving operations Part 2: scientific diving AS/NZS 2299.2:2002 and Australian Standard™ Work in compressed air and hyperbaric facilities Part 2: Hyperbaric oxygen facilities AS 4774.2-2002.

Standard delivery of hyperbaric oxygen therapy (HBOT) in Australian hospital-based facilities involves breathing 100% oxygen at 243 kPa (2.4 Ata) for periods of usually 120 minutes for each treatment session (Smart and Bennett 2010). It is usual for patients suffering with chronic conditions, such as a diabetic leg ulcer, to be prescribed 40 or more treatments of hyperbaric oxygen. The actual delivery of hyperbaric oxygen is most commonly administered via a 'hood' system (figure 1) with patients seated in a multi-place chamber. This is a shared experience for patients (Cooper et al 2009) (figure 2) attended to by a RN or 'inside attendant'.

Figure 1: Amron™ Hood System

Figure 2: Multi-place Chamber Department of Diving and Hyperbaric Medicine, Royal Hobart Hospital 2012

Hyperbaric oxygen medicine is historically associated with the treatment of the diving 'bends'. A comprehensive list of medical and surgical conditions that also benefit from HBOT has been established by the Australian and New Zealand Hyperbaric Medicine Group (ANZHMG 2012) (table 1).

Table 1: Accepted indications for hyperbaric therapy

BROAD INDICATION	SPECIFIC INDICATION
Bubble Injury	Decompression illness Arterial gas embolism (Diving/ Iatrogenic/ Misadventure)
Acute Ischaemic Conditions	Compromised flaps/grafts Crush injury/Compartment syndrome Reperfusion injuries Sudden sensorineural hearing loss Avascular necrosis
Infective Conditions	Clostridial myonecrosis Necrotizing fasciitis non clostridial Myonecrosis necrotizing cellulitis Malignant otitis externa Refractory mycoses Refractory ostemyelitis Intracranial abscess
Radiation Tissue Injury	Osteoradionecrosis Established Prophylactic Soft tissue radiation injury Established Prophylactic
Problem Wounds	Chronic ischaemic problem wounds Diabetic: ulcers/gangrene/post-surgical Non –diabetic problem wounds: Pyoderma gangrenosum Refractory venous ulcers Post-surgical problem wounds
Toxic Gas Poisoning	Carbon monoxide poisoning (Mod/Severe) Carbon monoxide poisoning delayed sequelae
Ocular Ischaemic Pathology	Cystoid macular oedema Retinal artery / vein occlusion
Miscellaneous	Thermal burns Bells palsy Frostbite
Adjuvant to Radiotherapy	As adjunct to radiotherapy in treatment of solid tumours

Review of various position statements from a number of facilities show the RN employed in a hyperbaric facility has a multifaceted role that includes:

- acting as an 'inside attendant' that involves being pressurised at the same time as patients during their treatment inside the multi-place chamber to a treatment depth;
- compliance with the usual nursing paradigm in terms of initial patient assessment, patient education, collaboration with other medical personnel, planning of treatment and goals of care and scheduling follow-up care (most facilities have a large outpatient component);

- delivering a diverse range of direct patient care such as wound management, medication administration, airway management etc;
- easing patient anxiety about the decompression treatment and preparing patients for lengthy periods in a closed chamber;
- driving programs associated with patient education and health promotion;
- educating peers; and
- participating in research.

Many facilities employ a small number of RNs as permanent staff and a significant number of casual staff. This is a deliberate decision to promote compliance with workplace health and safety requirements. Once an RN has completed their role as an inside attendant (typically being pressurised to 14 metres of sea water for 100 minutes) for any given day, it is a requirement of the Defence and Civilian Institute of Environmental Medicine (DCIEM) decompression tables that the nurse cannot be compressed again within 18 hours (Cooper et al 2009).

Workplace Health and Safety are mainstays of practice in all hyperbaric facilities. The routine of each clinical day is regulated to accommodate AS 4774.2 and AS/NZS 2299.2 plus the National Fire Protection Association (NFPA) fire code (NFPA 2012). It is these comprehensive documents that inform the workplace and ensure best practice for both the patient and the RN. There remain, however, numerous work-related risks associated with hyperbaric nursing. Some nurses can experience varying physical side effects from continual exposure to highly pressurised environments. Cooper et al (2009 p71) write specifically of decompression illness (DCI), or 'the bends', as a potential injury following an episode of being an inside attendant and make comment that 'it is not acceptable to expose staff members, potentially thousands of times in a career to health risks'. It is this level of insight that informs the specialties understanding of risk mitigation, however, these types of injuries are rare, with Cooper et al (2009) reporting zero cases in 6,062 attendant exposures.

Hyperbaric nurses are in high demand; this is a growing field that provides challenging work and cutting edge technology that can be very rewarding. Current minimum employment requirements include registration as a nurse with the Australian Health Practitioner Regulation Agency (AHPRA), at least two years' work experience and completion of Part 1 of a recognised hyperbaric training course. Neither medical nor nursing professions have routinely embraced student undergraduate placements in Australian hyperbaric facilities.

Recruitment and retention of RNs is a national issue (AHWAC 2004). Future planning strategies may be needed to ensure a sustainable workforce. In order to better understand the career pathway for a RN working in this small specialty, a survey of the current incumbents was undertaken. Hyperbaric nurses working in Australian Diving and Hyperbaric facilities in August 2013 were invited by email to complete an online, anonymous survey titled, 'Who we are and where do we come from?'

METHODS

Questionnaire

A mixed methods research methodology using a 16-point web based survey (Survey Monkey ™) questionnaire (including space for free text comments) was distributed to participants via the Hyperbaric Technicians and Nurses Association (HTNA) membership email listing in August 2013. The questions related to five major headings including demographics, education, professional experience, employment status and workplace health and safety. A small onsite pilot was undertaken in the workplace of the researcher and refinements made based on evaluation of the data and feedback. An information sheet explained the purpose and aims of the survey. Participation was voluntary and all information was de-identified.

Participants

All members of the HTNA were invited to participate in the survey. This targeted sample reflects nurses who are currently working in a Department of Diving and Hyperbaric Medicine Unit (private and/or public facility) across Australia.

Data Collection and analysis

All data was collected and analysed via the web-based Survey Monkey™ program. Responses to each question were tallied and graphed. Qualitative data, where relevant, was tabulated and themed for researcher interpretation and analysis.

FINDINGS

A total of 68 surveys were issued with 49 (72.1%) completed within the allocated time-frame of two weeks. Four facilities were represented by the 49 respondents.

Demographics / Professional experience

The majority of respondents were:

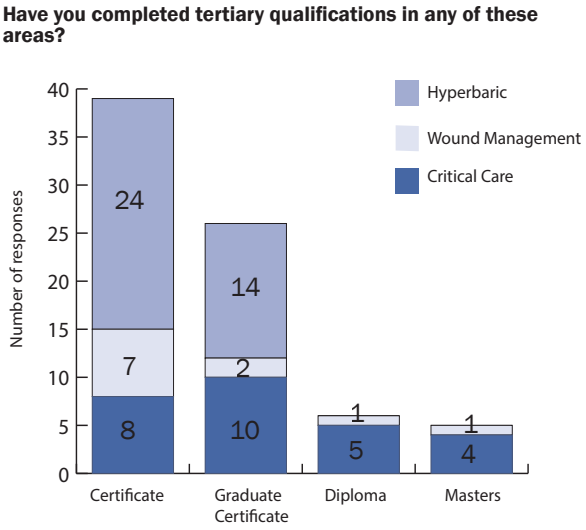
- female (43/49, or 87.7%);
- aged between 45-54 years (21/49, or 42.9%);
- employed in the field of diving and hyperbaric medicine for between 2 and 10 years (38/49, or 77.6%); and
- holding other clinical positions within the hospital(47/49, or 95.9%).

Respondents (29/49, or 59.2%) predominately expressed an ongoing intent to remain in the specialty for a further five years or more. All of those surveyed indicated they had been recruited to hyperbaric from an acute care environment, either surgical, medical, intensive care or emergency.

Post Graduate Education

Graph 1 shows respondents had a significant number of formal post graduate tertiary qualifications. A free text section in the survey allowed the respondents to write about post graduate education and training. Data offered showed a commitment by the respondents to remain up-to-date with current best nursing/medical practice.

Graph 1: Tertiary qualifications



Fifty eight point seven percent (27/49 or 58.7%,) of respondents reported their involvement/assistance with research studies within their facility and a further 16.3% (8/49) had undertaken independent research themselves.

Employment status

Three quarters (37/49 or 75.5%) of those who responded were permanently employed in a part time (less than 37.5 hours per week) or casual (no contracted hours per week) capacity. On-call commitment varied with 18.4% (9/49) doing no on-call duties, and the remaining 81.6% (40/49) committed to between one and five on-call sessions per fortnight (see graph 2). For

most nurses 'on-call' was recorded as being a non-contractual commitment based on a 'volunteer' system. Three facilities expressed 'on-call' as a mandatory component of employment and as such it is written into the position description.

Working inside the chamber as an attendant for a medical treatment is colloquially referred to as being 'compressed'. Respondents stated they were compressed 4 out of a maximum 10 opportunities as afforded by their roster. One respondent commented that 'I was compressed as often as permitted by the Australian Standard 4774.2'

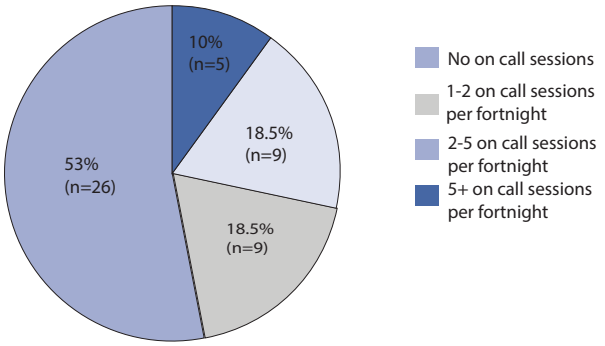
Fifty percent (24/48 or 50%) received a financial remuneration, or allowance, following an episode of 'being compressed'. This financial sum was of varying amounts and was not consistent across workplaces. The allowance is titled either "in chamber compression allowance" or more colloquially "risk money". One respondent did not answer this question.

Workplace Health & Safety

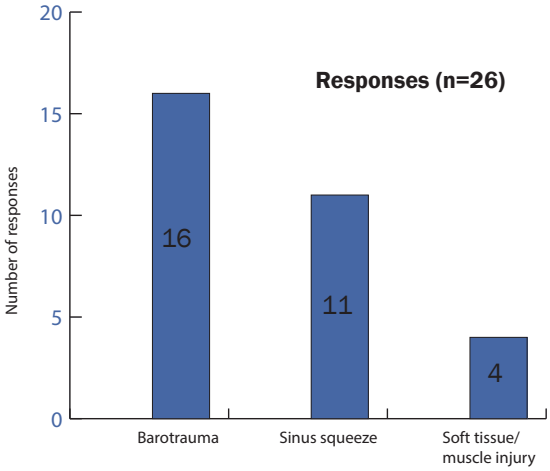
Respondents were asked if they had ever experienced an injury whilst working in the chamber. The results are shown in graph 3.

Graph 2: Participation in on call sessions

Do you participate in an on call roster in your facility? Responses (n=49)



Graph 3: Injuries experienced while working in the hyperbaric chamber



Ninety one point eight percent (45/49 or 91.8%) of respondents undergo an annual medical examination as per recommendations from AS 4774.2. Of these, 84.4% (38/45) reported also having a formal audiology assessment. 'Formal' was considered to be an assessment conducted off site, at a separate time to the medical examination and usually performed in an approved sound proof booth. Five respondents (5/49 or 10.2%) self-reported having a decompression injury following a hyperbaric exposure.

DISCUSSION

Findings from this survey show that the current cohort of RNs employed in the specialty of Diving and Hyperbaric Medicine in Australia are predominantly female, aged 45-54, with broad clinical experience and educated to a high academic standard. This demographic compares well to a similar size group (n=32) of RNs working in the largest Hyperbaric Medicine Department in the United States of America (USA) based at Duke University Hospital. The average age reported at this facility was 38 years and the average years of service between 3.5 and 20 years (Kevin Kraft, NUM Duke University Hospital, email, 20.08.13). The Australian data demonstrates female nurses in the middle of their career are the typical group for recruitment and consequently retention in this unique field. It may also speak to the proposition forwarded by Freshwater and Stickley (2004 p93) that

'every nursing intervention is affected by the master aptitude of emotional intelligence'. Working as the only healthcare provider inside a multi-place hyperbaric chamber during a treatment calls for outward serenity and calm – any panic could be contagious for all of the patients in the chamber.

All 49 respondents (100%) had completed Part 1 of the graduate certificate of Diving and Hyperbaric Medicine, while only 51% (25/49) had completed Part 2. One nurse commented, 'why do Part 2 just to get a post graduate certificate?' This rationale could account for the lower completion rate. It is a national training and safety requirement in Australia and New Zealand that all RNs working in a compressed gas environment (hyperbaric chamber) must successfully complete a standard training. The curriculum for this training has been influenced by the HTNA and endorsed by the University of Adelaide, South Australia. This is the only certificate level course currently offered in Australia and is available in two parts. Part 1 of the course is a compulsory requirement for employment and is delivered on-site in the local clinical facility by the doctors/nurses/technicians based in that department. The course is customised accordingly to each facility. The hospital/facility must provide a suitable environment for the practical component and competencies to be achieved. The second part (Part 2), which is non-compulsory, is required to successfully complete the post graduate certificate and is delivered as an on-line module from the University of Adelaide, South Australia.

Whilst acknowledging the educational system is slightly different in the USA, Duke University Hospital reported 100% of their registered nurses having an equivalent post graduate certificate. Most recently La Trobe University in Victoria (Australia) has added a diploma level module to its suite of critical care post graduate education.

Registered nurses recruited to the specialty have a minimum of two years post graduate experience. This is a requirement informally agreed upon nationally by all facilities to attract personnel who have established clinical skills and a level of confidence with their primary nursing roles and responsibility. The usual RN role when working in the facility is that of inside attendant. It is essential that they understand and feel confident to practice in this autonomous and very different environment. When the RN is performing their duties as an inside attendant they are required to rely on their individual clinical skills and competence as it can take up to eight minutes for other medical personnel to be compressed and consequently able to assist in any medical or practical emergency. The delivery of a specifically designed and structured hyperbaric course, coupled with pre-existing skill sets results in a blended practitioner who is versatile, autonomous and able to work under pressure physically, emotionally and environmentally.

Student nurses are offered placements in hyperbaric centres in both the United Kingdom (UK) and USA but not currently in Australia. Wilkinson (2006) comments on a number of advantages of having student placements in hyperbaric facilities, such as engaging students to increase their knowledge about the specialty and learning essential nursing skills that are transferable to all environments. The reason for Australian hyperbaric facilities not yet welcoming students to this unique field may be that much of the daily hyperbaric routine is focused around the actual administration of hyperbaric treatment and the students' role would be limited to an observer in this context. An Australian survey by Halcomb et al (2011) on self-reported preparedness of new graduate nurses to work in critical care showed a potential benefit of clinical placements in specialty areas. New graduate nurses who had more than one week clinical placement in critical care reported greater confidence and interest in seeking employment after graduating. This may become an important factor to consider should recruitment of hyperbaric nurses in Australia become a future workforce issue.

There appears to be a self-reported increase in decompression illness (DCI) awareness amongst inside attendants. Respondents were asked 'Have you had or do you know anyone who has had DCI?" Results indicated five RN's (5/49 or 10.20%) responded yes to this question. Latest published evidence from Cooper et al (2009) and Uzun et al (2011) clash with this survey data. Both studies report retrospective analysis from

their facilities of no reported cases of attendant DCI. Cooper et al (2009) and Uzun et al (2011) state that, in their opinion, DCI risk is low when there is compliance with routine treatment tables and when preventive measures are in place. Alternative explanations to account for the self-reported DCI awareness could include breaches of the four hour restriction before undertaking exercise or travelling to >300 metres above sea level. Hyperbaric inside attendant management policies should include post dive restrictions.

Further longitudinal studies are needed and it may be timely to repeat the Australian study completed by Cooper et al (2009) at the 10 year mark to further evaluate safety systems for inside attendants.

CONCLUSION

Hyperbaric medicine is recognised as a specialist environment for patients and healthcare personnel. It is also, of necessity, a highly regulated environment due to workplace health and safety considerations. Registered nurses are a key member of the hyperbaric workforce team working as inside attendants during a compression treatment in mostly a part-time or casual capacity. This survey demonstrates the recruitment and retention of female nurses in the middle of their career ensures a high level of job fit. They are highly skilled and experienced, with many holding relevant tertiary level qualifications and contributing to the ongoing body of evidence that describes and frames hyperbaric nursing. This survey provides a snapshot and describes a general profile of the Australian hyperbaric nursing workforce that could prove useful for future recruitment or workforce planning.

LIMITATIONS

This survey is subject to several limitations. Although the response rate of 72.1% was acceptable, not all registered nurses working in the field of Diving and Hyperbaric Medicine in Australia and New Zealand in 2013 completed the survey. The survey was only offered to those registered nurses who were members of the HTNA. Eleven of the fifteen Australian facilities were not represented.

REFERENCES

Australian Diving and Hyperbaric Medicine Research Group website. University of New South Wales. https://powcs.med.unsw.edu.au/research/groups/diving-and-hyperbaric-medicine (accessed 18.08.14).

Australian Health Workforce Advisory Committee. 2004. The Australian Nursing Workforce- An Overview of Workforce Planning, AHWAC Report 2004.2, Sydney.

Australian/New Zealand Standard™ Occupational diving operations Part 2: scientific diving AS/NZS 2299.2:2002 Standards Australia International Ltd, GPO Box 5420, Sydney, NSW 2001 and Standards New Zealand, Private Bag 2439, Wellington 6020 ISBN 0 7337 4448 6.

Australian Standard™ Work in compressed air and hyperbaric facilities Part 2: Hyperbaric oxygen facilities AS 4774.2-2002 Standards Australia International Ltd GPO Box 5420 Sydney NSW 2001 Australia ISBN 0 7337 4464 8.

Cooper, D.P., Van den Broek, C. and Smart, D.R. 2009. Hyperbaric chamber attendant safety II: 14-year health review of multiplace chamber attendants. *Diving and Hyperbaric Medicine,* 39(2):71-76.

Frawley, G., Bennett, M., Thistlehwaite, K. and Banham N. 2013. Australian paediatric hyperbaric oxygen therapy 1998-2011. *Anaesthesia Intensive Care,* 41:74-81.

Freshwater, D. and Stickley, T. 2004 The heart of the art: emotional intelligence in nurse education. *Nursing Inquiry* 11(2):91-98.

Gray, B. 2008 The emotional labour of nursing. *Nurse Education Today*, 29(2):168-175.

Halcomb, J., Salamonson, Y., Raymond, D. and Knox, N. 2011 Graduating nursing students' perceived preparedness for working in critical care areas. *Journal of Advanced Nursing* 68(10):2229-2236.

National Fire Protection Association. 2012. NFPA 99: Health Care Facilities Code. 2012 Edition. http://www.nfpa.org/codes-and-standards/document-information-pages?mode=code&code=99 (accessed 18.08.14).

Personal communication with Kevin Kraft BSN, ACHRN, NUM Hyperbaric Centre, Clinic 1f/1G Duke University Hospital, USA. Email 20.08.13

Smart D and Bennett M. (2010) The world as it is ANZHMG statement on the administration of mild hyperbaric oxygen therapy. Diving and Hyperbaric Medicine 40(2):78-82.

Uzun, G., Mutluoglu, M., Hakan, A. and Yildiz, S. 2011. Decompression sickness in hyperbaric nurses: retrospective analysis of 4,500 treatments. *Journal of Clinical Nursing,* 20:1784-1787.

Wilkinson, R. 2006. The pressure is on: student clinical placements in a hyperbaric medical centre. *The Clinical Teacher,* 3(1):43-48.

Health literacy screening instruments in adults with cardiovascular disease and their importance to the nursing profession

AUTHOR

Alex Chan
RN, BN, GradDipCardiacNursing, MN, MEd
Lecturer, University of Tasmania, School of Health Sciences,
1 Leichhardt Street, Darlinghurst, New South Wales, Australia
a.chan@utas.edu.au

KEY WORDS

health literacy, measurement of health literacy, health literacy assessment, secondary prevention, cardiovascular disease, screening instrument

ABSTRACT

Objective
To provide context information about the currently available health literacy screening instruments that may be applicable to adults with cardiovascular disease and their importance to the nursing profession.

Primary argument
Cardiovascular disease is a major health concern in Australia. Most cardiovascular diseases can be prevented and managed by reducing the cardiovascular risk factors. However healthcare professions, including nurses, may overestimate the health literacy skills of adults, and result in ineffective communication and misunderstanding. Adults with inadequate health literacy skills are often less compliant with their prescribed preventive treatments. As such an accurate health literacy assessment would not only promote therapeutic communication and the relationships between nurses and adults but it would also improve the compliance of secondary preventive treatment and the overall health outcomes. So this leads to the question, what health literacy screening instruments are available to measure the health literacy skills of adults with cardiovascular disease?

Conclusion
A review of primary research dated from 2005 to 2014 indicated the derivative versions of TOFHLA and REALM are the two main instruments used to measure the health literacy skills of adults with cardiovascular disease. Accurate health literacy measures can assist nurses to develop strategies to improve the overall health outcomes of adults with complex needs and inadequate health literacy skills. As nurses comprise a substantial proportion of the healthcare workforce, they have the potential to make changes in the healthcare system and improve the quality of health education provided to this population group.

INTRODUCTION

Cardiovascular disease (CVD) is a major public health issue in Australia. It accounted for 31% of all deaths in 2011, and 482,000 hospitalisations in 2009 – 2010 (National Heart Foundation of Australia 2013). In 2008 to 2009, it is estimated over $7,000 million, approximately 12% of healthcare expenditure was spent on CVD care (Australian Institute of Health and Welfare 2014). With the advance of pharmacological therapies and interventional cardiovascular technology, many CVD patients survive from acute events but live with a chronic medical condition for the rest of their lives. In general, CVD is a preventable disease and many of the risk factors can be managed through lifestyle modification and preventive treatment (National Heart Foundation of Australia and Australian Healthcare and Hospitals Association 2010). However adults with limited or marginal health literacy may often misinterpret the health related information, resulting in ineffective communication with the healthcare professionals, including nurses, as well as under-utilising the healthcare services for secondary preventive treatment. Statistics show that only 41% of Australians aged 15 to 74 had an adequate health literacy skill (Australian Institute of Health and Welfare 2012). This literature review aims to provide context information about currently available health literacy screening instruments for adults with CVD and to highlight the importance of these tools for nursing professions.

Secondary prevention of CVD

Secondary prevention, commonly known as cardiac rehabilitation was first introduced in the early 1970s and became a multifaceted management in 1994 (Savage et al 2011). Today's secondary prevention/cardiac rehabilitation results in lifelong care for CVD patients. Evidence suggests compliance with the secondary preventive management can significantly lower mortality and morbidity (Hamm et al 2011; Neubeck et al 2011), as well as improve the clinical stability, prognosis and quality of life in adults with CVD (Piepoli et al 2010). However adults at high risk of CVD are often unlikely to attend the preventive program. Statistics show that approximately 70 to 85% of CVD patients would not adhere to their secondary preventive treatments (Neubeck et al 2011). As a result, these adults receive suboptimal management for their CVD risk factors leading to higher recurrence rates and medical costs.

Health literacy and secondary preventive management

In a recent systematic review, Sørensen et al (2012, p3) defined health literacy as:

> *linked to literacy and entails people's knowledge, motivation and competences to access, understand, appraise, and apply health information in order to make judgments and take decisions in everyday life concerning healthcare, disease prevention and health promotion to maintain or improve quality of life during the life course.*

That is to say, patients need to have the necessary reading and numerical skills to understand the health literature, and analyse the contents in order to make the decisions for their health. Many studies have suggested there is a close relationship between the levels of health literacy and utilisation of healthcare services (Morris et al 2006; Ko et al 2011; Safeer et al 2006; Adams 2010; Adams et al 2009). Patients who are functionally illiterate and/or are from culturally and linguistically diverse backgrounds have been found to be more often at risk of having difficulties in communicating with healthcare professions (Schyve 2007).

Many healthcare professions including nurses believe they use lay language to communicate with their patients but in fact, patients with inadequate health literacy may misinterpret the information and this possibility may result in different responses (Risser et al 2007). In general, adults who have not completed high school education are more unlikely to have adequate functional health literacy skills (Johnson et al 2013). In some cases, adults may be literate in one aspect of health literacy but may be illiterate in other areas, such as numeracy; therefore education level is not a good indicator of health literacy skills in general (Johnson et al

2013; Weiss 2007). A formal health literacy assessment would be helpful for the healthcare professions to identify patients with less than adequate health literacy skills. Without a health literacy assessment, healthcare professions may overestimate patients' literacy skills, thus leading to ineffective exchange of information between them and patients. As discussed earlier, adults living with heart disease are the most-at-risk population groups but are often less compliant with secondary preventive treatment and self-management of chronic conditions (Adams et al 2009). Although the reason for non-compliance in secondary preventive treatment can be multifactorial, the effects of health literacy should not be underestimated. From the public health prospective, limited health literacy could have a significant impact on the total healthcare budget and the attitude towards secondary preventive treatments by the general public (Kickbusch et al 2013).

In clinical settings, nurses play an important role in providing clear and accurate health education to patients (Johnson 2014). Nurses have the ability to make changes in the healthcare system and improve the communication between healthcare professions/organisations and patients (Dickens and Piano 2013). In general, adequate health literacy measures would not only identify patients with less than adequate health literacy skills but also assist nurses to provide relevant levels of health education to patients.

METHOD

A review of current literature was completed using CINAHL, PubMed and Medline databases. The selected search terms for the database search were 'measurement of health literacy', 'assessment of health literacy', 'health', 'literacy', 'cardiovascular disease', 'tool', 'instrument' and 'measure'. A total of 67 publications were retrieved. Each article was manually reviewed and only primary research dated from 2005 to 2014 with a tool, instrument or method to assess or measure health literacy in relation to a CVD management were selected for review. After the examination, five publications met the selection criteria.

DISCUSSION

All the selected studies were published in English. Accordingly, the two most popular health literacy screening instruments used to measure the health literacy of adult patients with CVD were the shortened version of the Test of Functional Health Literacy in Adults (S-TOFHLA) and the Rapid Estimate of Adult Literacy in Medicine (REALM) (table 1). Overall, most of these studies focused on native English speaking populations (Chen et al 2013; Ibrahim et al 2008; Giuse et al 2012). Giuse et al (2012) attempted to recruit Spanish speaking patients in their study but unfortunately, the response rate was very low (n = 1) in the first experiment. As a result, only English speaking patients were recruited in the second experiment. In another study conducted by Kim (2009), the Korean Functional Health Literacy test (numeracy: r = 0.82; reading comprehension: r = 0.78) was utilised to measure the health literacy in older Korean adults. To improve the accuracy of this functional health literacy test, part of the instrument was translated from the TOFHLA and part of the instrument was redesigned based on the Korean healthcare system and culture.

Both Fransen et al (2011) and Ibrahim et al (2008) aimed to evaluate and validate the applicability of the health literacy instruments developed in other countries. Ibrahim et al (2008) compared REALM (r = 0.70) that was originally designed for the American population with the British general literacy screening test, the Basic Skills Agency Initial Assessment Test (BSAIT) in the United Kingdom (UK). In a similar vein, Fransen et al (2011) translated four selected literacy screening instruments to Dutch and evaluated their applicability in the Netherlands. Instruments examined included REALM (r = 0.91), Newest Vital Sign (NVS) (r = 0.78), Set of Brief Screening Questions (SBSQ) (r = 0.67) and Functional Communicative and Critical Health Literacy (FCCHL) (r = 0.68).

In the following sections, the most important findings and scientific comparisons will be discussed for each health literacy instrument that was used in the selected studies.

Rapid Estimate for Adult Literacy in Medicine (REALM)

REALM is one of the most common and reliable adult health literacy screening tests (Bass et al 2003; Baker et al 1999; Ibrahim et al 2008; Conlin and Schumann 2002). This expression, 'recognition test' was first developed by Davis in 1991 to evaluate patients' reading abilities in primary care settings in the United States of America (USA) (table 2). Individuals were tested on their reading and pronunciation skills (Davis et al 1991). The original REALM test consisted of 125 common medical terms and the participants were scored from 0 to 115+ (grade 3 to high school level). The duration of this test was approximately 3–5 minutes. The test format was revised in 1993 and the length of the shorter version (REALM-S) was reduced to 66 items with administration time of 1–2 minutes (Davis et al 1993). The coefficient alpha (Cronbach's coefficient of internal consistency) of these tests was 0.98 and 0.99 (Jordan et al 2011). Since then many derivative versions were developed to suit the needs in different clinical settings and target groups, these include REALM-R, REALM-SF and REALM-Teen (Jordan et al 2011).

However the REALM test is only in English and pronunciation may vary from one population group to another, such as between American and British English (Jordan et al 2011). In addition, an individual may correctly pronounce the medical terms yet not understand the meanings (Dewalt et al 2004).

Test of Functional Health Literacy in Adults (TOFHLA)

TOFHLA measures the ability of an individual's reading and understanding of health information using health-related materials. The original TOFHLA test was developed in 1995 to measure the understanding of health information among adult clients in healthcare facilities (Jordan et al 2011). Unlike REALM, TOFHLA not only measures the ability of reading but also the comprehension of passages and numerical information (Parker et al 1995). The main focus of TOFHLA is the health literacy skills of adults at the functional level. The test consists of 50 reading comprehension questions and 17 numerical questions. Individuals are given actual hospital forms, referral letters, patient information and medication labels to read, and then required to verbally respond to a series of questions in relation to the materials (Parker et al 1995). The average administration time is 22 minutes (Jordan et al 2011). Individuals are scored from 0 to 100, from inadequate to adequate health literacy.

In addition to the English version, Parker et al (1995) created a Spanish version (TOFHLA-S) at the same time. Both English and Spanish TOFHLA tests have the coefficient alpha of 0.98 (Jordan et al 2011; Parker et al 1995). TOFHLA has been considered as the most accurate assessment tool to evaluate the comprehension ability of adults. However the duration of administration may take up to 22 minutes therefore it is not very practical in busy clinical settings. As a result, many derivative versions were developed to shorten the administration time with some modifications in the content to suit the needs of different target populations such as the short form TOFHLA (S-TOFHLA) (Baker et al 1999) and the Health Literacy Test for Singapore (HLTS) (Ko et al 2011).

Newest Vital Sign (NVS)

NVS is a streamlining functional health literacy screening instrument aimed to identify individuals with poor literacy skills in the primary care setting. Compared to TOFLHA and REALM, NVS is quick – the test can be completed in three minutes (Adams et al 2009). It was developed based on the concept of TOFLHA and was made available in English and Spanish (Weiss et al 2005). During the assessment, individuals are given a nutritional label to read, and then they answer a series of six questions to measure their level of understanding and ability to utilise the text and numerical information provided on the label (Weiss et al 2005; Adams et al 2009). The coefficient alpha of NVS was found to be > 0.76 in English and 0.69 in Spanish (Weiss et al 2005).

It is important to note that the legal requirements for nutritional labels are not internationally standardised. The differences in layout and content on the labels may have an impact on the cross-cultural applicability and psychometric quality of the instrument (Fransen et al 2011). In comparison, NVS may be more sensitive than TOFHLA in detecting marginal health literacy, but possibly it may overestimate the ability of individuals with limited literacy skills (Adams et al 2009).

Set of Brief Screening Questions (SBSQ)

According to Fransen et al (2011), SBSQ is a subjective measure but the cross-cultural applicability is relatively high. It consists of three 5-point Likert scale questions: "how often do you have someone help you read …", "how confident are you filling out medical forms …" and "how often do you have problem learning about …". Overall, the design of these questions is insensitive to the identification of individuals with marginal and inadequate health literacy skills (Chew et al 2004). The confidence interval for identifying inadequate or marginal health literacy ranged from 0.53 to 0.72. Similar results (0.62 to 0.72) were found in a validation study in 2008 (Chew et al 2008). There are very few studies available for review.

Functional Communicative and Critical Health Literacy (FCCHL)

FCCHL was originally created to measure the functional, communicative, and critical health literacy of Japanese people with type-2 diabetes. This Japanese health literacy screening instrument not only measures functional health literacy but also the ability to analyse, understand and utilise health-related information (Ishikawa et al 2008). It consists of 14 questions, and individuals respond to each question on a 4-point Likert scale. The overall coefficient alpha of this test is 0.78. However FCCHL was specifically designed for the Japanese, and therefore the results may not be generalisable to other population groups. Additionally, the two most commonly used health literacy instruments—TOFHLA and REALM—are unavailable in Japanese. As a result, the correlations between FCCHL and these measures were not examined (Ishikawa et al 2008). Fransen et al (2011) indicated that the correlation of the translated Dutch version of REALM with FCCHL was weak ($r = 0.15$, $p = 0.04$). Apart from Fransen et al (2011) and Ishikawa et al (2008), FCCHL has not been applied in other studies. Therefore, further study is required to validate this instrument especially with the English speaking population.

CONCLUSION

The concept of health literacy screening to identify adults with limited or marginal health literacy is not new, and the effects of health literacy on adults with chronic medical conditions have been well established. The two main instruments reviewed here are the derivative versions of TOFHLA and REALM. As nurses comprise a substantial proportion of the healthcare workforce, nurses have the potential to make changes in the healthcare system. This would improve the quality of health education provided to adults with less than adequate health literacy skills, as well as improving their overall health outcomes. Accurate health literacy measures not only assist nurses to identify adults with limited or marginal health literacy but also facilitate the development of strategies to address the complex needs of this population group. However this literature review reveals that study of health literacy in adults with CVD in the last 10 years is very limited. Further research is needed to develop instruments that can assist nurses to identify adults with inadequate health literacy more efficiently and accurately in busy clinical settings.

Table 1: Instruments used to measure health literacy in adults with cardiovascular disease

	(Giuse et al 2012)	(Fransen et al 2011)	(Ibrahim et al 2008)	(Kim 2009)	(Chen et al 2013)
Purpose	To investigate the impact of administering health information based on the health literacy level alone or in combination with the participants' preferred learning style.	To evaluate and validate the applicability of the REALM, NVS, SBSQ and FCCHL instruments in the Netherlands.	To validate REALM for use in the UK against the British general literacy screening test, the BSAIT.	To investigate the relationships of health literacy and functional health status in Korean older adults.	To examine the relationships of health literacy, heart failure knowledge, self-efficacy and self-care behaviours.
Health literacy screening instrument(s)	S-TOFHLA	REALM, NVS, SBSQ and FCCHL	REALM and BSAIT	The Korean Functional Health Literacy test.	S-TOFHLA
Validity of the instrument(s)	Not established	r = 0.91 (REALM-D) r = 0.78 (NVS) r = 0.67 (SBSQ) r = 0.68 (FCCHL)	r = 0.70	r = 0.82 (numeracy subscales) r = 0.78 (reading comprehension subscale)	Not established
Target population	English and Spanish speaking patients at an emergency department.	Dutch speaking patients in the community.	English speaking patients admitted to hospital for coronary heart disease investigation.	Korean older adults in the community	English speaking patients presented to the heart failure clinics.

Notes: S-TOFHLA, Short form of the Test of Functional Health Literacy in Adults; REALM, the Rapid Estimate of Adult Literacy in Medicine; SAHLSA, Short Assessment of Health Literacy for Spanish-speaking Adults; VARKTM, Visual, Aural, Read/Write, Kinesthetic Inventory; NVS, Newest Vital Sign; SBSQ, Set of Brief Screening Questions; FCCHL, Functional Communicative and Critical Health Literacy; BSAIT, Basic Skills Agency Initial Assessment Test

Table 2: Functional health literacy instruments available in adults with cardiovascular disease

	TOFHLA	S-TOFHLA	REALM	NVS	FCCHL
Author	***(Parker et al 1995)***	***(Baker et al 1999)***	***(Davis et al 1991)***	***(Weiss et al 2005)***	***(Ishikawa et al 2008)***
Purpose	To develop an English and Spanish instrument to measure adults' ability in reading health-related materials.	To develop a shorter version of the TOFHLA to assess adults' ability in reading and understanding health-related materials.	To develop a rapid-screening instrument to directly assess the adults' ability of reading common medical and lay terms that adults are expected to recognise in primary care setting.	To develop a quick and accurate English and Spanish screening tool to identify adults with low health literacy.	To examine the psychometric scales for measuring three different health literacy levels in Japanese adults with diabetes.
Duration	Up to 22 minutes	Up to 12 minutes	3 to 5 minutes	3 minutes	Not identified
Design	The reading comprehension section is a 50-item test using the modified cloze procedure. The passages are selected from instructions for preparation for an upper gastrointestinal procedure, the patient rights and responsibilities section of a Medicaid application form, and a standard hospital informed consent form. The numeracy section consists of 17-items. It assesses adults' numerical skills of interpreting the instructions for taking medication, monitoring blood glucose level, keeping clinic appointments and obtaining financial assistance.	The reading comprehension section is reduced to 36 cloze items. Four numeracy items are selected from the original 17-items in TOFHLA.	A reading recognition test. It consists of 125 words. Adults are assessed on their ability to read and pronounce common medical words and lay terms for body parts and illness.	Adults are given a nutritional label from an ice cream container to read and then asked 6 questions about their interpretation of the information contained on the label.	The instrument contains a total of 14 items: 5 items are designed to assess adults' functional health literacy 5 items are in relation to the ability in communicative health literacy 4 items are created to measure the ability in critical health literacy.

Table 2: Functional health literacy instruments available in adults with cardiovascular disease, *continued*

Scoring	0–59: inadequate health literacy 60–74: marginal health literacy 75–100: adequate health literacy	0–53: inadequate health literacy 54–66: marginal health literacy 67–100: adequate health literacy	0–78 (below 4th grade): may not be able to read most low literacy materials 79–103 (4th to 6th grade): may need low literacy materials 104–114 (7th to 8th grade): may struggle with most patient education materials 115–above (high school level): able to read most patient education materials	0–1: greater than 50% chance of having marginal or inadequate literacy skills 2–3: marginal health literacy 4–6: indicate adequate literacy skills	Each item was scored on a 4-point scale, ranging from 1 (never) to 4 (often). Higher mean scores indicate higher health literacy level.
Validity	REALM: r = 0.84 (English) WRAT-R: r = 0.74 (English)	REALM: r = 0.80 (overall) REALM: r = 0.61 (numeracy) REALM: r = 0.81 (reading)	SORT: r = 0.95 PIAT-R: r = 0.94	TOFHLA: r = 0.59 (English) TOFHLA: r = 0.49 (Spanish)	Total health literacy: Diabetes knowledge: r = 0.37 Number of information sources: r = 0.40 Self-efficacy: r = 0.30
Reliability	Cronbach's α = 0.98 (English & Spanish)	Cronbach's α = 0.68 (numeracy) Cronbach's α = 0.97 (reading)	Cronbach's α = 0.98	Cronbach's α = 0.76 (English) Cronbach's α = 0.69 (Spanish)	Cronbach's α = 0.78

REFERENCES:

Adams, R.J. 2010. Improving health outcomes with better patient understanding and education. Risk Management and Healthcare Policy, 3(1): 61-72.

Adams, R.J., Appleton, S.L., Hill, C.L., Dodd, M., Findlay, C. and Wilson, D.H. 2009. Risks associated with low functional health literacy in an Australian population. Medical Journal of Australia, 191(10): 530-534.

Australian Institute of Health and Welfare. 2012. Australia's health 2012. Australia's health no. 13. Australian Institute of Health and Welfare: Canberra. Cat. no. AUS156.

Australian Institute of Health and Welfare. 2014. Health-care expenditure on cardiovascular diseases 2008-09. Australian Institute of Health and Welfare: Canberra. Cat. no. CVD 65.

Baker, D.W., Williams, M.V., Parker, R.M., Gazmararian, J.A. and Nurss, J. 1999. Development of a brief test to measure functional health literacy. Patient Education and Counseling, 38(1): 33-42.

Bass, P., Wilson, J. and Griffith, C. 2003. A shortened instrument for literacy screening. Journal of General Internal Medicine, 18(12): 1036-1038.

Chen, A.M., Yehle, K.S., Albert, N.M., Ferraro, K.F., Mason, H.L., Murawski, M.M. and Plake, K.S. 2013. Health Literacy Influences Heart Failure Knowledge Attainment but Not Self-Efficacy for Self-Care or Adherence to Self-Care over Time. Nursing Research and Practice, 2013(Article ID 353290). http://www.hindawi.com/journals/nrp/2013/353290/citations/ (accessed 20.10.14).

Chew, L., Bradley, K. and Boyko, E. 2004. Brief questions to identify patients with inadequate health literacy. Family Medicine, 36(8): 588-594.

Chew, L.D., Griffin, J.M., Partin, M.R., Noorbaloochi, S., Grill, J.P., Snyder, A., Nugent, S.M., Baines, A.D., Bradley, K.A. and Vanryn, M. 2008. Validation of screening questions for limited health literacy in a large VA outpatient population. Journal of General Internal Medicine, 23(5): 561-566.

Conlin, K.K. and Schumann, L. 2002. Research. Literacy in the health care system: a study on open heart surgery patients. Journal of the American Academy of Nurse Practitioners, 14(1): 38-42.

Davis, T., Long, S., Jackson, R., Mayeaux, E., George, R., Murphy, P. and Crouch, M. 1993. Rapid estimate of adult literacy in medicine: a shortened screening instrument. Family Medicine, 25(6): 391-395.

Davis, T.C., Crouch, M.A., Long, S.W., Jackson, R.H., Bates, P., George, R.B. and Bairnsfather, L.E. 1991. Rapid assessment of literacy levels of adult primary care patients. Family Medicine, 23(6): 433-435.

Dewalt, D.A., Berkman, N.D., Sheridan, S., Lohr, K.N. and Pignone, M.P. 2004. Literacy and health outcomes: a systematic review of the literature. Journal of General Internal Medicine, 19(12): 1228-1239.

Dickens, C. and Piano, M.R. 2013. Health literacy and nursing: an update. The American Journal of Nursing, 113(6): 52-57.

Fransen, M.P., Van Schaik, T.M., Twickler, T.B. and Essink-Bot, M.L. 2011. Applicability of internationally available health literacy measures in the Netherlands. Journal of Health Communication, 16 (Suppl 3): 134-149.

Giuse, N.B., Koonce, T.Y., Storrow, A.B., Kusnoor, S.V. and Ye, F. 2012. Using health literacy and learning style preferences to optimize the delivery of health information. Journal of Health Communication, 17 (Suppl 3): 122-140.

Hamm, L.F., Sanderson, B.K., Ades, P.A., Berra, K., Kaminsky, L.A., Roitman, J.L. and Williams, M.A. 2011. Core competencies for cardiac rehabilitation/secondary prevention professionals: 2010 update: position statement of the American Association of Cardiovascular and Pulmonary Rehabilitation. Journal of Cardiopulmonary Rehabilitation & Prevention, 31(1): 2-10.

Ibrahim, S.Y., Reid, F., Shaw, A., Rowlands, G., Gomez, G.B., Chesnokov, M. and Ussher, M. 2008. Validation of a health literacy screening tool (REALM) in a UK Population with coronary heart disease. Journal of Public Health, 30(4): 449-455.

Ishikawa, H., Takeuchi, T. and Yano, E. 2008. Measuring Functional, Communicative, and Critical Health Literacy Among Diabetic Patients. Diabetes Care, 31(5): 874-879.

Johnson, A. 2014. Health literacy, does it make a difference? Australian Journal of Advanced Nursing, 31(3): 39-45.

Johnson, T.V., Abbasi, A., Kleris, R.S., Ehrlich, S.S., Barthwaite, E., DeLong, J. and Master, V.A. 2013. Assessment of single-item literacy questions, age, and education level in the prediction of low health numeracy. Journal of the American Academy of Physician Assistants, 26(8): 50-54.

Jordan, J.E., Osborne, R.H. and Buchbinder, R. 2011. Critical appraisal of health literacy indices revealed variable underlying constructs, narrow content and psychometric weaknesses. Journal of Clinical Epidemiology, 64(4): 366-379.

Kickbusch, I., Pelikan, J., Apfel, F. and Tsouros, A.D. 2013. Health Literacy: The solid facts. WHO Regional Office for Europe. http://www.euro.who.int/__data/assets/pdf_file/0008/190655/e96854.pdf (accessed 12.06.14).

Kim, S.H. 2009. Health literacy and functional health status in Korean older adults. Journal of Clinicial Nurse, 18(16): 2337-2343.

Ko, Y., Lee, J.Y.C., Toh, M.P.H.S., Tang, W.E. and Tan, A.S.L. 2011. Development and validation of a general health literacy test in Singapore. Health Promotion International, http://heapro.oxfordjournals.org/content/early/2011/04/04/heapro.dar020.abstract (accessed 13.06.14).

Morris, N., MacLean, C., Chew, L. and Littenberg, B. 2006. The Single Item Literacy Screener: Evaluation of a brief instrument to identify limited reading ability. BMC Family Practice, 7(1). http://www.biomedcentral.com/1471-2296/7/21 (accessed 13.06.14).

National Heart Foundation of Australia. 2013. Cardiovascular disease: data and statistics. National Heart Foundation of Australia: Canberra. https://www.heartfoundation.org.au/information-for-professionals/data-and-statistics/Pages/default.aspx (assessed 12.06.14).

National Heart Foundation of Australia and Australian Healthcare and Hospitals Association. 2010. Better hospital care for Aboriginal and Torres Strait Islander people experiencing heart attack. National Heart Foundation of Australia and Australian Healthcare and Hospitals Association: Canberra. http://www.heartfoundation.org.au/SiteCollectionDocuments/A-ATSI-Better-Hospital-Care-20110812.pdf (assessed 12.06.14).

Neubeck, L., Freedman, S.B., Clark, A.M., Briffa, T., Bauman, A. and Redfern, J. 2011. Participating in cardiac rehabilitation: a systematic review and meta-synthesis of qualitative data. European Journal of Cardiovascular Prevention & Rehabilitation, 19(3): 494-503.

Parker, R.M., Baker, D.W., Williams, M.V. and Nurss, J.R. 1995. The test of functional health literacy in adults: a new instrument for measuring patients' literacy skills. Journal of General Internal Medicine, 10(10): 537-541.

Piepoli, M.F., Corrà, U., Benzer, W., Bjarnason-Wehrens, B., Dendale, P., Gaita, D., McGee, H., Mendes, M., Niebauer, J., Zwisler, A.D.O. and Schmid, J.P. 2010. Secondary prevention through cardiac rehabilitation: from knowledge to implementation. A position paper from the Cardiac Rehabilitation Section of the European Association of Cardiovascular Prevention and Rehabilitation. European Journal of Cardiovascular Prevention & Rehabilitation, 17(1): 1-17.

Risser, J., Jacobson, T.A. and Kripalani, S. 2007. Development and psychometric evaluation of the self-efficacy for appropriate medication use scale (seams) in low-literacy patients with chronic disease. Journal of Nursing Measurement, 15(3): 203-219.

Safeer, R.S., Cooke, C.E. and Keenan, J. 2006. THe impact of health literacy on cardiovascular disease. Vascular Health and Risk Management, 2(4): 457-464.

Savage, P.D., Sanderson, B.K., Brown, T.M., Berra, K. and Ades, P.A. 2011. Clinical Research in Cardiac Rehabilitation and Secondary Prevention: Looking back and moving forward. Journal of Cardiopulmonary Rehabilitation & Prevention, 31(6): 333-341.

Schyve, P.M. 2007. Language Differences as a Barrier to Quality and Safety in Health Care: The Joint Commission Perspective. Journal of General Internal Medicine, 22(Suppl 2): 360-361.

Sørensen, K., Van den Broucke, S., Fullam, J., Doyle, G., Pelikan, J., Slonska, Z. and Brand, H. 2012. Health literacy and public health: a systematic review and integration of definitions and models. BMC Public Health, 12(80). http://search.ebscohost.com/login.aspx?direct=true&db=cmedm&AN=22276600&site=ehost-live (accessed 13.06.14).

Weiss, B.D. 2007. Health literacy and patient safety: Help patients understand (2nd). Chicago: American Medical Association Foundation and American Medical Association. http://med.fsu.edu/userFiles/file/ahec_health_clinicians_manual.pdf (accessed 12.06.14).

Weiss, B.D., Mays, M.Z., Martz, W., Castro, K.M., DeWalt, D.A., Pignone, M.P., Mockbee, J. and Hale, F.A. 2005. Quick assessment of literacy in primary care: the newest vital sign. Annals of Family Medicine, 3(6): 514-522.

Working with refugee young people: a nurse's perspective

AUTHOR

Nyaradzai Garakasha
RN, MCN (Immigration Nursing); CNS
New South Wales Refugee Health Service
157-161 George Street, Liverpool NSW Australia
nyaradzai.garakasha@sswahs.nsw.gov.aul

KEY WORDS

Refugees; young people; acculturation; mental health; support systems; resettlement

ABSTRACT

Objective
To improve the health outcome of young people from a refugee background through sharing nursing experiences and processes that can be used to effectively address young people's health related problems.

Setting
Primary Health Care.

Subjects
Newly arrived young people between the ages of 12-24 years from a refugee background.

Primary argument
There is evidence that a young person's personal responses to history of torture and trauma, displacement, loss and interruption to family life; intertwined with adolescent uncertainty may lead to particular challenges. All young people require nurses and clinicians with the knowledge and skills to address their health problems. However this particularly vulnerable group also require health professionals that can approach these young people and their families in a manner that is culturally and professionally acceptable. This paper seeks to share some of the experiences gained while working with adolescents and youths from refugee backgrounds including common health issues raised by young people, their families and communities. In addition it will suggest some processes that are being used to address health issues. This includes setting up a health initiative that seeks to address health issues in a familiar supportive environment that is acceptable to the young people their families and communities.

Conclusion
Refugee young people are a special group of people with different needs when compared to adults from a refugee background. It is very important for nurses to identify these needs and know how to identify the problems young people from a refugee background face. As clinicians it is very important to be aware of the issues facing refugee young people and the best way to approach young people so they feel welcome. Working with refugee young people requires patience and relationship building. It is very important to treat refugee young people as individuals and to involve the young people and their families in the treatment and problem solving as much as possible in order to get the best result.

INTRODUCTION

Refugee young people in Australia enter the country through the humanitarian program and may have experienced and/or witnessed traumatic events such as war and armed conflicts (Carlson et al 2012; Bond et al 2007). Young people comprise 12% of the refugee population who arrived in Australia between 2012-2013 (Department of Immigration and Citizenship 2013). Some of these young people enter Australia unaccompanied and some with their families. Common health problems for refugee young people are different from the health problems for the general population (Griffiths et al 2003) due to exposure to various traumatic experiences including mass murder, rape, extreme deprivation and torture (Aptekar 2004 pp377-410; Grizenko 2002). The common health problems for refugee young people include: post-traumatic stress disorder (PTSD) (Jefferson 1999; Cunningham and Silove 1993 pp751-762); infectious diseases, poor nutrition, dental problems, undiagnosed chronic conditions and physical trauma (Burnett and Peel 2001; Gavagan and Brodyaga 1998). Their vulnerability increases when faced with barriers associated with migration such as language and culture. Refugee young people require culturally appropriate and trauma sensitive services. The host community's policies and practices have a large impact on the health outcomes of young refugees during the resettlement period (Bhabha and Schmidt 2008; Silove et al 2000). Nurses are often the main health contact for these young people. It is vital that nurses working with refugee young people are equipped with knowledge and skills to deliver quality effective care. Although there are a few guidelines written on working with refugees for example Foundation House (2012), these are mainly directed towards medical practitioners. There is very limited material for nurses working with refugee young people. This lack of professional support and guidance may put the nurse looking after young people at risk of burnout and developing secondary trauma (Griffiths et al 2003). However it is very difficult to have a manual that suits all refugee young people taking into consideration the diversity of the refugee communities and cultures even for those from the same country. It is also important to note there are limited studies about refugee young people in Australia as most of the information used is from the international community (Cameron et al 2011). This paper seeks to share some of the experiences and problem solving techniques that have been helpful across cultures in trying to help improve the refugee young people's health outcomes and improve the relationship between the health personnel and young people.

MAIN HEALTH RELATED PROBLEMS IDENTIFIED

Psychological trauma

It is very important to note that psychological trauma for young people from a refugee background may happen before migration, while in transit or during the resettlement period. It is acknowledged that there are a lot of changes that happen naturally during the adolescent stage of development due to hormonal changes and changes in the anatomical structure of the brain (Paus et al 2008); however these changes can be disturbed by trauma that happens during adolescent and teenage years. Studies such as Brough et al (2003) and Fazel et al (2009) proved that although young people are resilient they are at risk of psychological issues even after resettlement. Before migration, a lot of young people experience and witness war; murders; bomb explosions; rape or sexual violence and a lot of torture and trauma inflicted to them or their relatives (Bean et al 2006; Sourander 1998; Felsman et al 1990). Despite surviving these atrocities some adolescents may not want their psychological issues addressed. A lot of young people though admitting to history of torture and trauma often just want to forget about it and move on (Halcon et al 2004). During transit young people face numerous issues in a foreign country where resources are often very limited; there is uncertainty about their final destination and they are often required to learn a new language. After arrival into the country of resettlement, young people find it very difficult to adjust; learn the new language and catch up academically. During resettlement

young people may feel the pressure of role changes within the family. These tensions may arise from their ability to quickly learn the new language resulting in the 'mini-parent' phenomena whereby they become the key negotiator/translator in the family helping with appointments, shopping and communication. A lot of young people with post trauma experiences have been missing out on getting help and later on these problems have been resurfacing mostly as behaviours (Brown et al 2006; Lloyd 2006). A mental health assessment for young people in the first few weeks after arrival often does not yield any positive results. It helps to let them settle first; form relationships; gain their trust; then do a mental health assessment when support systems are in place such a school, church, friends and the community. Linking them into health groups and main stream youth health services does help young people to interact with others and form relationships. When doing mental health assessments for refugee young people it is very important to note they may have a very low literacy level, even in their own language, or may be fluent in another language such as the language spoken in the country of asylum. Trauma experience varies depending on the country of origin and where the young person was while seeking asylum. For example; if young a young person was in a refugee camp the trauma experiences may be linked to lack of resources like clean water, healthy food, medications and clothing. Young people who were staying in their community may have witnessed death, bombs and shelling in the streets. One effective treatment approach is to focus on symptoms. As noted in a systematic review conducted by Gardiner and Walker (2010) and Perkonigg et al (2005) adolescents may present with the following symptoms: learning and behavioural problems, poor appetite and sleep, psychosomatic symptoms, enuresis and encopresis as well as low self-esteem and guilt. For a more accurate assessment it is suggested to involve the family mostly because family experience has shown to have an impact on their children's mental health (Gardiner and Walker 2010). In the case of refugee young people, it is mainly exposure to war and trauma affecting both children and parents and their emotional response is usually interrelated (Panter-Brick et al 2009; Thabet et al 2008; Heptinstall et al 2004).

Vision and Hearing

Vision and hearing problems affect a third of young people from refugee backgrounds (World Vision 2009). The absence of good hearing and vision may affect resettlement and learning capabilities. Some of the reasons that increase the risk for refugee young people are: (WHO 2012; CDC 2012).

- poor nutrition such as deficiencies in vitamin A for vision and Iron for hearing;
- the effects of chronic ear /eye infections or infectious disease such as measles, mumps and rubella;
- noise from bombs and shelling; and
- Physical trauma to eyes and ears due to torture.

However, if you ask the young person whether they have any vision problems most of them will say no due to a number of reasons:

- not knowing that they have difficulties in hearing or seeing clearly;
- fear of the stigma attached to not being able to function normally;
- not sure what will happen to their refugee status if they are found to have health problems; and
- fear of the costs involved.

Parents and carers can be vital in answering some questions about the client's past medical history; however the medical history must never preclude the need to physically perform a screening test for both vision and hearing problems. The main thing is early detection of health issues as it is beneficial to both the consumers and the service providers; it saves costs and improves the outcome (Belli et al 2005).

Dental Problems

Dental problems are very common in newly arrived refugee young people. This may be attributed to poor health systems, lack of resources, lack of clean drinking water and nutritious food. Most young people have their dental health as a priority and will tell you about their dental problems, some will not be sure. Some young people will say no to treatment and dental problems due to fear of costs involved and previous bad experiences. As the vast majority of refugees are not covered by private health insurance it is very important that the young person is referred to public health services that bulk bill. Options such as dental vouchers and the school dental programs need to be discussed. The process needs to be explained to the young person and their family; ask the family for information regarding the young person's dental health as well as examine the mouth especially of school age young people.

Abnormal blood results

The most common abnormal blood results in refugee young people are: low vitamin D, strongyloides, hepatitis B, non-immunity to infectious diseases such as measles, and Rubella. The main thing is for the nurse to be able to identify the abnormal results and get appropriate treatment for the young person, for example attending to the catch up schedule for immunisations (NMHCR 2013). Referring to resources such as Foundation House (2012) can also be helpful.

Acculturation

Acculturation is a process of adapting to a culture different from the person's culture of origin. This process is a known stressor and risk factor that can affect the health and behaviour of newly arrived refugees (Bhugra 2003; McKelvey et al 2002; Clark and Hofsess 1998, pp37-59). For example most parents fear for their children during acculturation because they are scared they might lose their customs and traditions especially for girls where, for example, chastity means a lot to refugee communities. On the contrary, this may be a barrier that can hinder the young person to access some services. Most young people from a refugee background do not wish to identify or be known as refugees. This is mostly because:

- whilst they acknowledge they are from a refugee background they are no longer refugees;
- there is a stigma attached to the word 'refugees' which is portrayed by the host communities; and
- young people want to be seen and treated like their counter parts in the main stream population.

Because of the above reasons, young people make a big effort to adapt to the new culture as soon as possible and will respond very well if not treated in isolation.

Support Systems

Support systems are very important for young refugees as they offer much needed support mostly during the resettlement period. This support is mainly offered by the school, friends, community and family. In a longitudinal study done by Correa-Velez et al (2010) they suggested that protective factors for young people include: how fast the young person can learn the new language, starting relationships with friends and community, supportive family and school.

COMMUNITY

The community is very important to both the young person and their family as culture religion and language plays an important role in the coping mechanism for young people (Cameron et al 2011). In a study done by Geltman and Cochran (2005) community integration was proven to improve health prognosis in refugee young people.

Health Initiative

School based clinic

Why school based refugee clinic?

In 2012 the New South Wales Refugee Health Service commenced a once a week refugee health clinic at a high school in south western Sydney. This clinic was commenced in recognition of the trust young people and their families had with the school environment and was underpinned by the following:

1. To safe guard the existing health policies on equity of health; cultural competence (NSW Multicultural Act 2000) and safeguard young people's wellbeing (NSW Youth Health Policy 2011-2016, 2010).
2. To adopt research recommendations from the Population Council (2009) and the NSW Research Report Access to Health Care among NSW adolescents' (2002).
3. The Australian health system is fragmented and there are many barriers to providing effective health care (Smith 2006; Tiong et al 2006) which makes the services hard for young people to access.
4. A large number of refugee young people had missed a lot of schooling due to war and conflicts and as a result find it difficult to miss a day of school for a health related appointments.
5. The need for a one stop shop for refugee young people where they can access a variety of services under one roof.
6. Young people feel respected in the school as they are likely to be the centre of attention, not only at school but from the community, and they are given opportunities to make choices on issues affecting their health; such as choosing the topic of discussion for a health education talk or asking for their consent to share information with their parents and teachers.

This initiative has been successful and well supported by the community because:

- school is involved which is the main support system for the young people;
- young people feel more relaxed and are happy to discuss issues like sexual abuse and trauma which is very difficult to do in a clinic environment;
- there is continuity of care and it is easy to follow up the young person where there are issues such as change of residential address and phone number; and
- Counselling and health promotion activities such as cooking classes are held at the school.

Making Referrals

Referring young people to services in the health system can be a daunting task. This is because our health system is often fragmented. Some specialist areas such as intellectual disability and physical disability can be difficult to access. Unlike most Australian children who are diagnosed at an early stage, clients come to the clinic as teenagers and without a diagnosis. It takes a lot of negotiation and hard work to refer such clients. Young people can be linked with the general practitioner. In some cases the young person may be uncomfortable with the family doctor discussing sexual health and women's health issues. It is important to link them with a youth friendly doctor so they feel free and comfortable to talk about their health concerns.

This issue has been addressed by nurses from the refugee health clinic visiting medical centres, explaining what services the clinic provides and seeking support and assistance from the general practitioners. This method has worked well to date.

CONCLUSION

Refugee young people are a vulnerable group that belong to families and communities. Their needs and the way nurses and clinicians approach and address these young people need to be specific and acceptable to them. Young people from a refugee background need to be treated as individuals who belong to a family not just as part of the family. They need to be consulted and have an informed choice on issues that affect their health just like main stream young people. As refugee nurses experiences in primary health nursing and experience gained through working with refugee young people is heavily relied on. It is crucial to note that nurses should continually develop the ability to practice cultural awareness so that they recognise personal cultural assumptions that may affect the way they approach refugee young people's health needs (Purnell and Paulanka 2008; Racher and Annis 2007). As noted by Brough et al (2003), there is lack of evidence based support when working with refugee young people even though there is a lot of information to support their vulnerability. There is need for more studies and research on effective ways to work with refugee young people that is appropriate and culturally acceptable.

REFERENCES:

Aptekar, L. 2004. The changing developmental dynamics of children in particularly difficult circumstances: Examples of street children and war-traumatized children in U.P. Gielen and J. Roopnarine (ed). Childhood and adolescence: Cross-cultural Perspectives and Applications. Westport, CT: Praeger.

Australian Government Department of Health and Ageing. 2013. The Australian Immunisation Handbook 10th Edition, NHMRC, Commonwealth of Australia.

Bean, T., Eurelings-Bontekoe, E.H.M., Mooijaart, A. and Spinhoven, P. 2006. Factors associated with mental health service need and utilization among unaccompanied refugee adolescents. Administration and Policy in Mental Health and Mental Health Services Research, 33:342–355.

Belli, P.C., Bustreo, F. and Preker, A. 2005. Investing in children's health: what are the economic benefits? *The Bulletin of the World Health Organization*, 83:777-784.

Bhabha, J. and Schmidt, S. 2008. Seek asylum alone: Unaccompanied and separated children and refugee protection in the U.S. *The Journal of the History of Childhood and Youth*, 1(1):126–138.

Bhugra, D. 2003. Migration and depression. *Acta Psychiatrica Scandinavica*, 108:67–72.

Bond, L., Giddens, A., Cosentino, A., Cook, M., Hoban, P., Haynes, A., Scaffidi, L., Dimovski, M., Cini, E. and Glover, S. 2007. Changing cultures: enhancing mental health and wellbeing of refugee young people through education and training; Promotion and Education; 14(3):143-182.

Brough, M., Gorman, D., Ramirez, E., and Westoby, P. 2003. Young refugees talk about well-being: A qualitative analysis of refugee youth mental health from three states. *Australian Journal of Social Issues*, 38(2):193–209.

Brown, J., Miller, J. and Mitchell, J. 2006. Interrupted schooling and the acquisition of literacy: Experiences of Sudanese refugees on Victorian secondary schools. *Australian Journal of Language and Literacy*, 29(2):150–162.

Burnett, A. and Peel, M. 2001. Asylum seekers and refugees in Britain. The health of survivors of torture and organised violence. *British Medical Journal*, 322:606–609.

Cameron, G., Frydenberg, E. and Jackson, A. 2011. Young refugees in Australia: Perspectives from policy practice and research. *Children Australia*, 36(2):46–55.

Carlson, B.E., Cacciatore, J. and Klimek, B. 2012. A risk and resilience perspective on unaccompanied refugee minors, Social Work, 57(3):259-269.

Centers for Disease Control and Prevention. 2012. Hearing loss in children. Canadian Department of Health.

Clark, L. and Hofsess, L. 1998. Acculturation, in S. Loue (ed). Handbook of Immigrant Health. New York: Plenum.

Correa-Velez, I., Gifford, S.M. and Barnett, A.G. 2010. Longing to belong: Social inclusion and wellbeing among youth with refugee backgrounds in the first three years in Melbourne, Australia. *Social Science & Medicine*, 71:1399–1408.

Cunningham, M. and Silove, D. 1993. Principles of treatment and service development for torture and trauma survivors, in J.P. Wilson and B. Raphael (ed). International Handbook of Traumatic Stress Syndromes. New York: Plenum Press.

Commonwealth of Australia Department of Immigration and Citizenship. 2013. Statistics. http://www.immi.gov.au/media/publications/statistics/immigration-update/australian-migration-trends-2011-12-glance.pdf (accessed 20.08.13).

Fazel, M., Doll, H. and Stein, A. 2009. A school-based mental health intervention for refugee children: An exploratory study. *Clinical Child Psychology and Psychiatry*, 14:297–309.

Felsman, J.K., Leong, F.T., Johnson, M.C. and Felsman, I.C. 1990. Estimates of psychological distress among Vietnamese refugees: Adolescents, unaccompanied minors and young adults. *Social Science & Medicine*, 31(11):1251–1256.

Foundation House - the Victorian Foundation for Survivors of Torture (VFST). 2012. Promoting Refugee Health: A guide for doctors, nurses and other health care providers caring for people from refugee backgrounds (3rd edn, pp.380).

Gardiner, J. and Walker, K. 2010. Compassionate listening: Managing psychological trauma in refugees. *Australian Family Physician,* 39(4):198-203.

Gavagan, T. and Brodyaga, L. 1998. Medical care for immigrants and refugees. *American Family Physician*, 5:1061–1068.

Geltman, P.L. and Cochran, J. 2005. A private-sector preferred provider network model for public health screening of newly arrived refugees. *American Journal of Public Health*, 95(2):196-199.

Giedd, J.N. 2006. Structural Magnetic Resonance Imaging of the Adolescent Brain; Adolescent Brain Development: Vulnerabilities and Opportunities. *Annals of the New York Academy of Sciences*, 1021:11-12.

Griffiths, R., Emrys, E., Finney Lamb, C., Eagar, S. and Smith, M. 2003. Operation Safe Haven: The needs of nurses caring for refugees. *International Journal of Nursing Practice*, 9(3):183.

Grizenko, N. 2002. Psychiatric assessment and treatment of immigrant children in F.J.C. Ázima and Grizenko (ed). Immigrant and refugee children and their families: Clinical, Research, and Training Issues. Madison, CT: International Universities Press–190

Halcon, L.L., Robertson, C.L., Savik, K., Johnson, D.R., Spring, M.A., Butcher, J.N. and Jaranson, J.M. 2004. Trauma and coping in Somali and Oromo refugee youth. *Journal of Adolescent Health*, 35:17–25.

Heptinstall, E., Sethna, V. and Taylor, E. 2004. Post Traumatic Stress Disorder (PTSD) and depression in refugee children: Associations with pre-migration trauma and post-migration stress. *European Child & Adolescent Psychiatry*, 13(6):373-380.

Jefferson T. 1999.Primary care physicians and post-traumatic stress disorder. Journal of the American Medical Association, 282:1710–1711.

Lloyd, G. 2006. Worlds apart. The Courier Mail, pp 20–25.

McKelvey, R., Sang D., Baldassar, L., Davies, L., Roberts, L., & Cutler, N. 2002. The Prevalence of psychiatric disorders among Vietnamese children and adolescents. Medical Journal of Australia, 177:410–414.

Mendonca, L., Minchella, L., Selser, K., Soria, S. and Teskey, C. 2009. Immigrant and Refugee Youth: Challenges and Opportunities for the School Nurse. NASN School Nurse, 24(6)250-252.

NSW Centre for the Advancement of Adolescent Health. 2002. Research report, Access to Health Care among NSW Adolescent, The Children's Hospital at Westmead.

New South Wales Department of Health. 2010. NSW Youth Health Policy 2011-2016: Healthy bodies, healthy minds, vibrant futures. NSW Department of Health, North Sydney. http://www.health.nsw.gov.au/policies/pd/2010/PD2010_073.html (accessed 11.10.13).

New South Wales Government. 2000. Community Relations Commission and Principles of Multiculturalism Act. http://www.crc.nsw.gov.au/legislation_and_policy/principles_of_multiculturalism (accessed 20.08.13).

Panter-Brick, C., Eggerman, M., Gonzalez, V. and Safdar, S. 2009. Violence, suffering, and mental health in Afghanistan: a school-based survey. *The Lancet*, 374(969):807-816.

Paus, T., Keshavan, M. and Giedd, J.N. 2008. Why do many psychiatric disorders emerge during adolescence? *Nature Reviews. Neuroscience* 9(1):947-957.

Perkonigg, A., Pfister, H., Stein, M. B.and HÃfler, M. 2005. Longitudinal Course of Posttraumatic Stress Disorder and Posttraumatic Stress Disorder Symptoms in a Community Sample of adolescents and young adults. *The American journal of psychiatry*, 162(7):1320-1327.

Purnell, L. and Paulanka, B. 2008. Transcultural health care: A culturally competent approach.3rd Edition. Philadelphia: F.A. Davis Press

Racher, F.E. and Annis, R.C. 2007. Respecting Culture and Honouring Diversity in Community Practice. Research and Theory for Nursing Practice: An International Journal, 21(4):255-270.

Silove, D., Steel, Z. and Watters, C. 2000.Policies of Deterrence and the Mental Health of Asylum Seekers. *The Journal of the American Medical Association*, 284(5):604-611.

http://jama.jamanetwork.com/article.aspx?articleid (accessed 15.12.2013)

Smith, M.S. 2006. Refugees in Australia: changing faces, changing needs Editorial: *Medical Journal of Australia*, 185(11):587-588.

Sourander, A. 1998. Behavior problems and traumatic events of unaccompanied refugee minors. *Child Abuse and Neglect*, 22(7):719-727.

Thabet, A. A., Tawahina, A.A., El Sarraj, E. and Vostanis, P. 2008. Exposure to war trauma and PTSD among parents and children in the Gaza strip. *European Child and Adolescent Psychiatry*, 17(4):191-199.

The Population Council. 2009. Workshop Report, Adolescent Girls Programming and Capacity Building. http://www.popcouncil.org/pdfs/PGY09_AdolWkshopNairobi08.pdf (accessed 27.09.13).

Tiong, A.C., Patel, M.S., Gardiner, J., Ryan, R., Linton, K.S., Walker, K.A, Scopel, J. 2006. Health issues in newly arrived African refugees attending general practice clinics in Melbourne. *Medical Journal of Australia,* 185:602-606.

United Nations High Commissioner for Refugees. 2009. The 2007 Global Report. Geneva, Switzerland: Author.

World Health Organization 2012. Deafness and hearing loss. [Fact sheet, 2013]

World Vision. 2009. The Impact of Neglected Emergencies on Children. http://www.worldvision.com.au/Libraries/HEA_reports/The_Impact_of_Neglected_Emergencies_on_Children.pdf (accessed 14.10.13).

A nurses' guide to Quantitative Research

AUTHOR

Rebecca (Becky) Ingham-Broomfield
RN (NSW); CertEd; DipNurs (London); BSc (Hons);
MSc (Health Psychology)
Lecturer in Nursing, University of New England, Armidale,
NSW, Australia.
rbroomf3@une.edu.au

KEY WORDS

research methodology, Quantitative research, evidence based practice (EBP).

ABSTRACT

Objective
This article provides a breakdown of the components of quantitative research methodology. Its intention is to simplify the terminology and process of quantitative research to enable novice readers of research to better understand the concepts involved (Benner 1984).

Primary Argument
Globally, evidence-based practice (EBP) has become a major preoccupation of investigators and practitioners involved in the delivery of health care (Liamputtong 2013 pxxi). Working within the health sector requires the nurse to be familiar with research in a way that informs practice, especially if working towards a degree (**Wright-St Clair et al 2014). Nurses may benefit from a discussion that helps them understand the sequence of a research paper (Moxham 2012) that uses quantitative methodology.

Conclusion
The content of a typical quantitative research paper will be discussed in a systematic, logical order. A quantitative grid is provided at the end of the paper. Its intention is to aid the nurse to better understand the differing components of the four main quantitative research methods.

INTRODUCTION

There is an increased emphasis on EBP to substantiate clinical decision-making. EBP is defined as the conscientious integration of best research evidence with clinical expertise, patient values and needs in the delivery of high-quality, cost effective health care (**Wright-St Clair et al 2014; Burns and Grove 2009 p17). Health clinicians use tools, such as pain or depression scales, frequently in clinical practice and during research (Imms and Greaves 2013). In this paper only quantitative research will be discussed as one paradigm for researching health.

THE QUANTITATIVE RESEARCH PAPER

Definition and meaning of Quantitative research

Quantitative research is a means for testing objective theories by examining the relationship among variables (Polit and Hungler 2013; Moxham 2012). A variable is a factor that can be controlled or changed in an experiment (Wong 2014 p125). The word quantitative implies quantity or amounts. Information collected in the course of the study is in a quantified or numeric form (White and Millar 2014). This is referred to as statistical evidence (White and Millar 2014).

The variables include the Dependent variable (the variable which is hypothesised to depend on or be caused by another variable) or Independent variable (the variable that is believed to be the cause or influence) (Wong 2014; Polit and Hungler 2013). There may also be Extraneous variables (Polit and Hungler 2013), also known as Confounding variables (White and Millar 2014 p47), which confuse or confound the relationship between the Dependent and Independent variables. An example would be as follows: wound healing (Dependent variable) and type of dressing (Independent variable). Patient age and presence of Diabetes Mellitus would be Extraneous/Confounding variables.

Quantitative research falls within the philosophical underpinning of Positivism. A Positivist researcher believes in the concepts of objective reality (Jirojwong et al 2014 p362). Quantitative research attempts to establish statistically significant relationships, addresses questions by measuring and describing, is based on objective measurement and observation, and is concerned with correlation and causation (Hamer and Collinson 2014). A specific example of positivism is where there is generally consensual agreement on foundational aspects of human body structures (*Wright-St Clair 2014 p18).

Abstract/Summary

An abstract or summary should clearly outline the hypothesis or research question/s, aims and objectives of the study (Polit and Hungler 2013; Nieswiadomy 2012). A hypothesis is a statement of a predicted relationship between the variables under study (Polit and Hungler 2013). The research may state a Null hypothesis which predicts no relationship between the variables (White and Millar 2014 p43; **Wright-St Clair et al 2014, p.456). It should also cite the quantitative methods used to collect the data, the results, conclusions and recommendations for practice (Nieswiadomy 2012). Abstract length is generally less than 200 words (Borbasi and Jackson 2012 p178). The abstract may also include some of the limitations of the study.

Identifying the problem

The problem should clearly describe what is to be studied. The hypothesis, aims and/or objectives should be clearly and unambiguously stated. Ideally the topic is narrowed down to a specific one sentence statement of the problem (Nieswiadomy 2012). A useful strategy for formulating EBP question is the acronym PICO/s (patient, population or problem, intervention or interest, comparison, outcome and study design) (Hoffmann et al 2013 p22; **Wright-St Clair et al 2014 p457; Burns and Grove 2009 p474). Ideally four criteria are used in quantitative research namely significance, researchability, feasibility and interest to the investigator (Moxham 2012 p33).

Literature Search

The literature review is generally in the introductory section (Polit and Hungler 2013). The investigator needs to determine what is known and not known about the problem, identify gaps in knowledge, establish the significance of the study and situate the study within the current body of knowledge (Hoffmann et al 2013; Polit and Hungler 2013; Burns and Grove 2009). The literature search should consider how the major variables were explored by critiquing the strengths and limitations of the methods previously used. The investigator may also acquire information about other techniques, instruments and methods of data analysis as well as also identify potential problems that can be avoided in a new research (Polit and Hungler 2013).

METHODOLOGY

Designs

Quantitative research falls into four main designs, namely, Descriptive, Correlational, Experimental and Quasi-experimental (Borbasi and Jackson 2012; Burns and Grove 2009). The main aim of Descriptive Research is the accurate portrayal of the characteristics of individuals, situations, or groups and the frequency with which certain phenomena occur using statistics to describe and summarise the data (Polit and Hungler 2013). Correlational research explores the interrelationship amongst variables of interest without any active intervention on the part of the researcher (Polit and Hungler 2013). Experimental research is systematic and objective, particularly in medication trials, known as a Random Controlled Trials or RCT's. They are considered as the 'gold standard' in research evidence (Hamer and Collinson 2014 p19). In Experimental research the investigator controls the independent variable and randomly assigns subjects to different conditions. Quasi-experimental research is less powerful than Experimental due to the lower level of control (Burns and Grove 2009). The investigator manipulates an independent variable but subjects cannot be randomised (Polit and Hungler 2013). The choice of design should allow the variable to be measured or manipulated in the study (Burns and Grove 2009). Before a study can progress, the investigator will usually clarify and define the variables under investigation and specify how the variable will be observed and measured in the actual research situation (Polit and Hungler 2013). This is known as an operational definition (Polit and Hungler 2013; Nieswiadomy 2012). These four designs, discussed above, are compared in the grid at the end of this paper to highlight similarities and differences in style.

Instrument

Quantitative instruments may include self-reporting tools, questionnaires, observation, and biophysical measures (Polit and Hungler 2013). Commonly used methods in nursing research also include focus groups and interviews that are qualitative in nature (Moxham 2012). Using both styles is referred to as mixed or multi-method research (Polit and Hungler 2013). Scales may be used to quantify specific information such as a Likert scale gives specific choices for example, strongly agree, agree, not sure, disagree, strongly disagree (Polit and Hungler 2013). Whatever instrument is used the reliability and validity of the instrument is essential. Reliability refers to the degree of consistency or accuracy with which an instrument measures the attribute it has been designed to measure (Polit and Hungler 2013). Data retrieved may look authoritative but it could be incomplete or inaccurate or may not be sufficiently reliable to be of value in generalising to the larger population. Concurrently, validity refers to the degree to which the instrument measures the phenomena in the first place or reflects the abstract construct being examined (Burns and Grove 2009 p479).

Sample

Descriptive research may use probability sampling which includes simple random, stratified sampling, proportionate stratified sampling and cluster sampling (Shaughnessy et al 2014). Random sampling is also known as probability sampling, rather than non-probability sampling, which ensures every element is

likely to be included in the sample (Shaughnessy et al 2014). Correlational and Experimental research use random sampling. Random sampling gives every member of a population an equal chance/probability of being included (Polit and Hungler 2013). Quasi-experimental research is called 'quasi' because it is part, or almost, experimental. The component that makes it quasi is the use of a convenience or accidental sample which does not give the population equal probability of being included and therefore, less rigorous in design (Polit and Hungler 2013).

Ethics

The investigator is obliged to consider the implications of the proposed research for the participating subjects, their families and society (Burns and Grove 2009). Most nursing research usually requires the permission of an appropriate ethics committee (Elliott et al 2012 p93; Jirojwong et al 2011 pp63-66). Ethical guidelines outline a set of standards for conducting research. Within their practice nurses have a moral and legal obligation to protect the privacy of an individual (Nursing and Midwifery Board of Australia 2012, Conduct Statement 5) and this holds true within nursing research. Equally important is the premise to protect individuals from the risk of significant harm (Nursing and Midwifery Board of Australia 2012, Conduct Statement 8). It is important that consent is obtained after full explanation of the study's intent (Borbasi and Jackson, 2012). Participants are entitled to withdraw from the study at any point without penalty (Jirojwong et al 2014 p70).

Pilot Study

A pilot study is a trial run of the research (Nieswiadomy 2012). It is conducted on a small number of participants to assess the adequacy and feasibility of the intended research (Moxham 2012 p35). By doing so the pilot study can identify problems and strengthen the quantitative methodology.

Main Study

The research process depends on the collection of data known more specifically as empirical data (Moxham 2012 p35) which is rooted in objectivity or a scientific approach (Polit and Hungler 2013). It is at this point that the researcher puts the design into action and ensures that the data is collected and recorded. The findings need to be analysed, and in the case of quantitative research, statistical analysis and interpretation is an essential part of answering the hypothesis or research questions (Borbasi and Jackson 2012 p114).

Results

Data analysis may involve descriptive or inferential statistics (Moxham 2012). Descriptive statistics describe and synthesise data and show patterns and trends (Moxham 2012) whereas inferential statistics permit the investigator to infer whether relationships noted in a sample might occur in a larger population (Polit and Hungler 2013). Numerical data may be presented in two forms, firstly as raw figures and percentages and secondly, more visually, as line graphs, tables or histograms (Burns and Grove 2009). To analyse variables statistically they have to be in a measurable form that means using numbers or scores (Borbasi and Jackson 2012).

Measures of central tendency, known as the average, identify how near the usual response a particular variable lies (Burns and Grove 2009). These averages are expressed as mean, median and mode (Burns and Grove 2009). The mean is the average, for example, all scores are added up and divided by the number of subjects. The median represents the exact middle score or value in a distribution of scores. The mode is the value that occurs most frequently in a distribution of scores (Polit and Hungler 2013; Burns and Grove 2009).

Probability refers to the likelihood of a particular outcome (White and Millar 2014 p43). Statisticians use p-values to measure probability (White and Millar 2014 p43). A simple example of probability is flipping a coin ten times. It will most likely fall five times as heads and five times as tails. To determine a significant result the statistics have to have levels of significance. Figures may be expressed as $p>0.05$ or $p<0.05$ (Burns and

Grove 2009 p37). If a probability result is statistically significant (p=<0.05) the result had a less than 5% possibility of being caused by chance and therefore becomes significant and important (Polit and Hungler 2013). Even when a result is claimed to be statistically significant it is important to remember the results may still tell us nothing that matters whilst relationships that do not achieve conventional levels of statistical significance can be important (Lempert 2008).

Another term used in quantitative research is the Confidence Interval (CI). Whenever a mean is calculated using a sample there is always the possibility of error. The investigator will calculate the CI. If they arrive at a CI of 95% it means that the investigator is satisfied that 95% of the true population lies between two values (Liamputtong 2013 p413) for example, the investigator may find average height of humans falls between 1.4m and 1.8m. Essentially the CI represents how true the estimate is (Hoffmann et al 2013 p80). A CI is an important reminder regarding the limitations of estimates. The greater the sample size the more precise the CI (Liamputtong 2013 p297).

Standard Deviation (SD) is the spread of data from a mean value (White and Millar 2014 p41). Using the example of human height, if normal standard height falls between 1.4m and 1.8m then heights outside those ranges deviate from the norm. The mean and standard deviation are two statistics that help determine differences and similarities in groups that are being researched (White and Millar 2014 p41).

Discussion/Recommendations

The discussion of findings allows the investigators to make interpretations (Nieswiadomy 2012) that need to be analysed in an objective and critical manner before drawing conclusions. Recommendations could be implemented in practice readily or cautiously taken up and piloted over a period of time. Alternatively the results may not be considered unless modifications are made. An important point to remember is that the research does not necessarily prove a point and may only suggest a relationship or highlight an issue needing further investigation. A body of evidence, to support clinical practice, particularly in RCT's, is the most reliable source of evidence (Borbasi and Jackson 2012 p195). Limitations of the research should be acknowledged.

Conclusions

All major findings related to the original aims of the study are discussed in relation to whether the data supports or negates the hypothesis or research question/s (Nieswiadomy 2012).

Reference List

Research papers conclude with a list including books, reports and other journal articles used to support the concepts outlined. For those interested in pursuing additional reading on the topic, the reference list provides an excellent starting place (Polit and Hungler 2013).

ARTICLE CONCLUSION

This paper has discussed quantitative research logically and systematically. Whilst this paper is deliberately simplified it still allows for the main components of the quantitative research process to be identified for the novice researcher in nursing (Benner 1984).

The Grid: An overview of the four styles of Quantitative Research

Content	Descriptive	Correlational	Experimental	Quasi-experimental
Sample	Simple random, Stratified Sampling, Proportionate Stratified Sampling and Cluster Sampling	Random	Random	Convenience or accidental
Example of types of instruments/ tools used	Can use both quantitative and qualitative methods. Relies on instrumentation to measure and observe. May use microscopes, computer models, survey method, as well as observational and measurement tools. Others may include case studies and archival research projects.	Survey method may be used to determine correlations, for example, when wattle flowers in Spring more people buy antihistamines. This type of research may be purely based on observation (also known as naturalistic research) where subjects are observed in their habitat looking for behavioural correlations.	A RCT is purely quantitative and a good example where one group is the experimental group (for example, consented patients receiving new drug) and one group which is random (patients receiving either an old tested drug or placebo). Post-test only.	Pre and post testing knowledge and skills using observation and questionnaire
Ethics permission	Essential	Essential	Essential	Essential

REFERENCES

Benner, P. 1984. Benner's Stages of Clinical Competence. Retrieved from http://www.health.nsw.gov.au/nursing/projects/Documents/novice-expert-benner.pdf (accessed 29.10.2014).

Borbasi, S. and Jackson, D. 2012. Navigating the Maze of Research. Chatswood, Sydney: Mosby Elsevier.

Burns, N. and Grove, S.K. 2009. The Practice of Nursing Research: Appraisal, Synthesis and Generation of Evidence. Maryland Heights, Missouri: Saunders Elsevier.

Elliott, D., Aitken, L. and Chaboyer, W. 2012. ACCCN's Critical Care Nursing. Chatswood, Sydney: Mosby Elsevier.

Hamer, S. and Collinson, G. 2014. Achieving Evidence-Based Practice - A Handbook for Practice. Retrieved from http://bookdirectory.net/?p=312122 (accessed 25.11.14).

Hoffmann, T., Bennett, S. and Del Mar, C. 2013. Evidence-Based Practice across the Health Professions. Chatswood, Sydney: Churchill Livingstone, Elsevier.

Imms, C. and Greaves, S. 2013. Measure Twice, Cut Once: Understanding the Reliability and Validity of the Clinical Measurement Tools used in Health Research. In P. Liamputtong (ed), Research methods in Health. South Melbourne: Oxford University press.

Jirojwong, S., Johnson, M. and Welch, A. 2014. Research Methods in Nursing and Midwifery (2nd Edition). Sydney: Oxford University Press.

Lempert, R.O. 2008. The Significance of Statistical Significance: Two Authors Restate An Incontrovertible Caution. Why a Book? Retrieved from http://repository.law.umich.edu/law_econ_archive/art86 (accessed 25/11/14).

Liamputtong, P. 2013. Research Methods in Health. South Melbourne: Oxford University Press.

Moxham, L. 2012. Nurse Education, Research and Evidence-Based Practice. In A. Berman, S. J. Snyder, T. Levett-Jones, M. Hales, N. Harvey, Y. Luxford, L. Moxham, T. Park, B. Parker, K. Reid-Searl and D. Stanley (Eds.), Kozier and Erb's Fundamentals of Nursing (2nd ed., Vol. 1). Frenchs Forest, Sydney: Pearson Australia.

Nieswiadomy, R.M. 2012. Foundations of Nursing Research. Boston: Pearson.

Nursing and Midwifery Board of Australia. 2012. Code of Professional Conduct for Nurses in Australia. Retrieved from http://www.nursingmidwiferyboard.gov.au (accessed 25/11/14).

Polit, D.F. and Hungler, B.P. 2013. Essentials of Nursing Research: Methods, Appraisal, and Utilization (8th Edition ed.). Philadelphia: Wolters Kluwer/Lippincott Williams and Wilkins

Shaughnessy, J.J., Zechmeister, E.B. and Zechmeister, J.S. 2014. Research Methods in Psychology. Online Retrieved from http://www.mhhe.com/socscience/psychology/shaugh/index.html (accessed 25/11/14)

White, L. and Millar, R.B. 2014. Quantitative Approaches. In V. Wright-St Clair, D. Reid, S. Shaw and J. Ramsbotham (Eds.), Evidence-based Health Practice. South Melbourne: Oxford University Press.

Wong, G. 2014. Research Questions. In V. Wright-St Clair, D. Reid, S. Shaw and J. Ramsbotham (Eds.), Evidence-based Health Practice. South Melbourne: Oxford University Press.

*Wright-St Clair, V., Reid, D. and Shaw, S. 2014. What, Why and How of Research. In V. Wright-St Clair, D. Reid, S. Shaw and J. Ramsbotham (Eds.), Evidence-based Health Practice. South Melbourne: Oxford University Press.

**Wright-St Clair, V., Reid, D., Shaw, S. and Ramsbotham, J. 2014. Evidence-based Health Practice. South Melbourne: Oxford University Press.

Urinary continence care in Australian nursing homes

AUTHORS

Ping Yu
Assoc Professor, PhD
Director, Centre for IT-enabled Transformation
School of Information Systems and Technology
Faculty of Engineering & Information Sciences
University of Wollongong, Wollongong NSW Australia
ping@uow.edu.au

David Hailey
Professor, PhD
School of Information Systems and Technology, Faculty of Engineering & Information Sciences,
University of Wollongong, Wollongong NSW Australia
dhailey@ozemail.com.au

Victoria Traynor
Assoc Professor, RN, PhD
School of Nursing and Midwifery
Faculty of Science, Medicine & Health
University of Wollongong, Wollongong NSW Australia
vtraynor@uow.edu.au

ACKNOWLEDGEMENT

This project is co-funded by an Australian government Enterprise Connect grant and Simavita Pty Ltd. Staff members from Simavita Pty Ltd, David Barda, Karen Carey, Betty Dought and Paul Fish, and Joanne Lawrence from Australian Catholic University contributed to the validation of the questionnaire and interview guide. Acknowledgements are given to the managers of the five nursing homes for allowing caregivers to participate in the study. We are grateful for the contribution of all caregivers who completed the survey questionnaire and interviews. Dr Madeleine Cincotta is acknowledged for editing the final manuscript.

KEY WORDS

urinary incontinence, assessment, care plan, practice management, nursing home

ABSTRACT

Objective
Exploring urinary continence (UC) assessment and management practices in Australian nursing homes.

Design
Mixed method using a questionnaire and interviews.

Setting
Five nursing homes in Australian metropolitan cities.

Subjects
Participants 121 staff: mostly female (91%) with a range of roles including personal care assistants (PCAs) (63%), enrolled nurses (ENs) (11%), registered nurses (RNs) (20%) and managers (4%).

Main outcomes measure(s)
Compliance with and perceptions about UC assessment and management.

Results
77% (n=71) of care staff (PCAs, ENs and RNs) were compliant with the UC management protocol of checking for wetness every 2 to 2.5 hours. Toileting time and frequency of changing continence aids varied between nursing homes. Perceptions about the accuracy of UC assessments and knowledge of an older person following UC assessment also differed between nursing homes.

Conclusion
Areas where UC assessment and management in nursing homes could be improved include identifying the voiding times of older people, compliance with care plans in management practice, and caregiver ability to assess the capacity of continence aids to absorb urine. Training for effective continence care in nursing homes needs to be enhanced.

INTRODUCTION

In Australia, over 180,000 older people live in nursing homes and 68% of these older people required urinary continence care (UC), including bladder management and assistance with toileting (Australian Institute of Health and Welfare 2011). The negative impact of urinary incontinence (UI) is reduced functional, psychological and social well-being, quality of life and increased risks of damaged skin, urinary tract infections and falls (Ostaszkiewicz et al 2012; Du Moulin et al 2008; Fonda et al 2005; Fultz and Herzog 2001). UI is more prevalent among individuals living with a dementia in nursing homes, with levels of cognitive impairment and immobility increasing the likelihood of UI occurring (Specht 2011). Direct costs of UC care include staff time to provide UC, continence products, laundering and barrier creams. Indirect costs include communicating with staff about UC care, documenting UC care, and attending training on continence (Frantz et al 2003). It was suggested that it takes a member of staff seven minutes to help an older person use the toilet, four minutes to apply barrier cream and seven minutes to change clothes with the addition of 9% of time from RNs in supervising PCAs to deliver a UC care plan (Frantz et al 2003).

Despite its impact and high prevalence, UI is not assessed nor managed effectively (Hawthorne 2006; Taunton et al 2005) and remains an under-studied area of healthcare research (Wagg et al 2008). The most commonly used strategies to promote UC in nursing homes are toileting assistance programs and the use of continence aids (Roe et al 2011). For these approaches to be effective, UC assessment needs to be accurate and appropriate. Screening, assessment, management and evaluation tools (Dowling-Castronovo and Spiro 2013a 2013b; O'Connell et al 2006) can be used to promote UC among older people living in nursing homes. These tools structure initial continence screening, the bladder chart/ diary, the bowel chart, full continence assessments, care plans and evaluations to monitor progress of UC interventions/ care plans. The screening forms should be completed with an older person within the first 48 hours of moving into a nursing home. The screening form is designed to establish whether a person has bladder and/or bowel problems and when further assessment is required. The bladder chart/ diary is completed during a three-day assessment and prompts staff delivering care to older people to document a person's voiding pattern at prescribed time points during 24 hours.

Thorough assessments using this evidence - based structured approaches can ensure UC management practices are effective for older people, including bowel management programs, habit retraining, social prompting and continence aid use. These UC interventions are well-defined but few studies have reported the effects of implementing these strategies for older people living in nursing homes. In particular, studies focusing on individuals living with a dementia are rare (Specht 2011; 2002). When UC assessment and management practices were observed in nursing homes in the United States of America (USA) it was found the staff implemented few structured approaches to UC assessment. Although taking an older person to the toilet every two hours was the prescribed intervention in UC care plans, this only occurred rarely with much more sporadic times used (Taunton et al 2005). In the USA nursing home care is funded using the Resident Assessment Instrument (RAI) (Medicare and Medicaid, 2013) and in Australia using the Aged Care Funding Instrument (ACFI) (Department of Health and Ageing 2013) which both use 11-15 care area assessment categories to define the needs of older people and determine the funding/cost of care. UC care is determined in the USA within the category of 'Bladder and Bowel' and in Australia within the two categories of 'Toileting' and 'Continence'.

While these structured approaches are well-defined, there is little information on how they are applied in routine practice. The objective of this study was to survey current UC assessment and management practices in Australian nursing homes.

METHODS

A cross-sectional study, consisting of a questionnaire survey and interviews, was conducted with care staff, consisting of personal care assistants (PCAs), Enrolled Nurses (ENs) and Registered Nurses (RNs). Five nursing homes in metropolitan cities of Australia participated. These were located in Sydney (home 1), Newcastle (home 2) and Melbourne (homes 3, 4 and 5). Convenience sampling was used to recruit participants.

The questionnaire was designed by the first author in consultation with a continence nurse and two RNs, all with extensive aged care experience. Three stakeholder consultation meetings were held to ensure content and face validity of the questionnaire. Questionnaire items consisted of demographic details, descriptions of UC assessment and management practices and the opinions of care staff about the effectiveness of UC practices. Opinions from care staff were generated from a seven point Likert scale, ranging from 1 (strongly disagree) to 7 (strongly agree). The questionnaires were distributed to care staff on visits to the nursing homes and collected on the same day.

Statistical analysis was undertaken on questionnaire responses using IBM SPSS Statistics 19. When data were normally distributed, ANOVA was conducted to identify significant differences between the sites. When no significant differences were found, the data were aggregated and presented with descriptive statistics for the total population; otherwise a post-hoc Tukey's test was conducted for between-site comparisons.

When data were not normally distributed, the Kruskal-Wallis test was conducted. If significant differences were found, the Mann-Whitney U Test was used for between-site comparisons. For data to be analysed using a non-parametric test, median and interquartile range (IQ) were presented for descriptive statistics. Pearson's Chi-square test was conducted to identify significant differences on the 'Yes or No' questions. Otherwise, data were aggregated and presented with descriptive statistics for the total population.

Additional information from care staff about their views and experiences of how UC assessment and management practices were implemented in nursing homes were generated from semi-structured interviews. Participants for the interviews came from homes 1 and 2. Content analysis was conducted on interview transcripts to generate an understanding about how care staff view UC assessment and management practices in nursing homes.

The study was approved by the institutional Human Research Ethics Committee, following agreement from each of the participating nursing homes.

RESULTS

There were 121 responses from the 230 questionnaires distributed to care staff (52.6% response rate) and 23 semi-structured interviews. There were no significant differences between the nursing homes in terms of participants' gender, age, job role, hours and shifts usually worked. The demographic profile of participants was similar to those in other studies (Martin and King, 2008). They were primarily female caregivers (91%) and most (63%) were unregistered PCAs. Other participants included ENs (11%), RNs (20%), managers (3%) and others (4%). Most (69%) of the participants worked part time, 17% were full time and 14% were casual employees. The UC assessment practices recommended by O'Connell et al (2006) were implemented in all five nursing homes.

Questionnaire responses

Frequency of checking for wetness within UC assessment ('check and change' intervention)

Shifts lasted eight hours and 66% of the care staff checked clients for wetness 3 to 4 times in a shift. 10% of them checked wetness more than 5 times (see table 1). The care staff in home 5 checked for wetness significantly more frequently ($p < 0.05$) than those in the other homes, who conducted checks at similar time intervals.

Table 1: Number of times a caregiver checked the wetness of an older person during a shift within the 3-day urinary continence assessment period

Frequency Times (N)	Homes 1, 2, 3 and 4 Percent (N)	Home 5 Percent (N)
0	7.2 (6)	11.1 (1)
1-2	16.9 (14)	0 (0)
3-4	66.3 (55)	44.4 (4)
5-6	7.2 (6)	11.1 (1)
7+	2.4 (2)	33.3 (3)
Total	100 (83)	99.9 (9)

Replacement of continence aids ('containment' intervention)

Details about when a continence aid was replaced were obtained from homes 1, 2 and 3. In homes 1 and 2, 26% (n = 31) and 52% (n = 27) of care staff, respectively, replaced the continence aid when it was wet (around 50% full). Significantly more care staff in home 3 replaced a continence aid when it looked soaked through (> 75% full) than those in homes 1 and 2 (96%, n = 28 vs 59%, n = 58, $p < 0.05$). In home 1, 36% of care staff (n = 31) changed a continence aid when requested. No caregivers did this in home 2.

Prompt for and frequency of toileting (bladder prompting intervention)

These aspects were investigated in homes 1 and 2. The proportion of care staff in home 2 who provided an older person with toileting assistance was higher than that in home 1 (55%, n = 28 vs 45%, n = 34, $p < 0.05$). Toileting activities were initiated by 48% (n = 30) of the care staff upon request; 40% (n = 25) followed the UC care plan and 24% (n = 15) provided toileting assistance at fixed times during a work day. One of the respondents provided assistance only after the other care priorities were met.

Perceptions of care staff about UC assessment and management practices

Perceptions about UC practices among care staff in their nursing homes were obtained from homes 1, 2, 4 and 5. Similar responses from these homes were received for 8 out of 13 statements (table 2).

Table 2: Caregivers' perceptions where there were similar responses from RACH

Statement	Number of respondents	Median (IQ)
Agreement with statement		
UC assessment produced information that improves my communication with other health service providers...	69	6.0 (2)
....or with co-workers	71	6.0 (1)
UC care plans give me useful information about the allocation of continence aids	26	6.0 (1)
Continence aids are allocated according to resident's UC care plan	27	6.0 (0)
Slight agreement with statement		
UC care plans for older people are up-to-date	71	5.0 (2)
Older people are provided with assistance according to their UC care plans	72	5.0 (3)
Information I got from the 3-day UC assessment was incomplete	70	5.0 (2)
Slight disagreement with statement		
UC assessment is not respectful to the older person	27	3.0 (3)

Significant differences among nursing homes (all $p < 0.05$) were found for five statements (table 3). The care staff in home 4 were less satisfied with the accuracy of information from the three-day UC bladder diary than those in the other three homes. They only 'slightly agreed' on understanding more about UC of an older person as a result of the UC assessment, compared with more positive responses from other homes. There were marked differences regarding the statement that UC assessment was easy to carry out, with agreement from two homes and slight disagreement from the others. While there were some differences among homes regarding understandability of information gained from UC assessment, and on UC care plans giving useful information about most appropriate toileting times, there was overall agreement on these items.

Table 3: The caregivers' perceptions about urinary continence assessment and management practices in four RACH.

	Responses			
Statement	***Home 1***	***Home 2***	***Home 4***	***Home 5***
Information I got from the current 3-day urinary continence assessment was accurate.	†[a]5.0 (2) n = 29	[a]5.0 (2) n = 24	[a]4.0 (2) n = 7	[b]6.0 (0) n = 11
It was easy to understand information from the 3-day urinary continence assessment.	[a]5.0 (2) n = 29	[b]6.0 (1) n = 24	[ab]5.0 (4) n = 7	[b]6.0 (1) n = 11
I understand more about the urinary continence of the older person as a result of the 3 day urinary continence assessment.		[a]6.0 (1) n = 27	[b]4.0 (2) n = 7	[ab]6.0 (2) n = 11
Urinary continence assessment was easy to carry out.	[a]3.0 (3) n = 28	[b]6.0 (1) n = 26	[ab]3.0 (4) n = 5	[b]6.0 (1) n = 11
Urinary continence care plans give me useful information about the most appropriate toileting times for the older person.		[a]6.0 (0) n = 26	[b]5.0 (3) n = 5	[ab]6.0 (2) n = 11

The three numbers presented in a cell represent: median (IQ) and n: number of participants. Measurement scale: 1 – strongly disagree; 7 – strongly agree. †The same superscript letters at the front of each number in a row suggest that the responses between the two RACH were similar. The different superscript letters at the front of each number in a row denote the answers from the different RACH were significantly different.

Interview responses

The following themes were generated from the interviews.

The challenge of continence assessment

Eight participants agreed that timely UC checks for an older person were not feasible in practice. Accurately identifying the exact time of a voiding event was also a challenge. Upon checking, there might be no sign of a UI event but a moment later the person might be wet. It was also suggested that the information captured in a UC assessment did not always include details about fluid intake and urine output, thus making the assessment less accurate and comprehensive. Some care staff considered manual checks, on the strip of a continence aid, to detect a wet event were intrusive to the privacy and dignity of older people.

Six participants saw the challenge of UC management as 'keeping them dry'. Two managers and one RN mentioned the challenges of maintaining the dignity of older people who are totally incontinent and of providing timely updating of the UC care plan to reflect changing UC care needs. Five PCAs saw time management as a challenge for effective UC care.

Information for care staff on UC

The information recorded in the bladder chart included fluid intake, frequency of visits to toilet, volume of urine voided and the condition of the continence aid used (e.g. wet or soaked). One RN explained:

> *"We would do a wet-dry chart and a fluid input and output chart as well. We just usually write down if the pad was slightly wet, or half wet or fully wet."*

RNs developed the UC care plan based on the assessment information about the voiding patterns. Re-assessment was conducted when the UC or health of the older person deteriorated. Signs of deterioration included losing weight, insertion of a catheter or increased wetness in-between visits to the toilet or UI episodes. As one RN said:

> *"If any changes happen, like they have increased wetness or require more pads or something changes like they are catheterised, then we update their care plan…"*

Scheduled toileting

One manager explained the common toileting schedule in nursing homes: "*…scheduled toileting tends to happen at various times. People are always toileted when they get up in the morning, it might be before or after breakfast. Generally it will be before lunch again and after lunch and then before dinner and after dinner and before going to bed. These will be the most common times for toileting to happen."*

One PC said: *"A lot of residents [sic] can voice if they want to go to the toilet, or they'll put their hand up and signal you. Sometimes they're just restless, so you can observe their behaviours."*

DISCUSSION

This study generated results from five nursing homes in Australia about the views and experiences of care staff about UC assessment and management practices. The results provided insight into how UC assessments and management practices were undertaken. They indicated some practice gaps for UC care that have been reported in the USA (Taunton et al 2005).

Care staff reported being satisfied with the information generated from UC assessments and believed it facilitated communication with outside healthcare providers and among co-workers. It also helped in the development of UC care plans. This was contrary to the findings of a USA study in which assessments were rarely structured and seldom informed care activities (Taunton et al 2005). Challenges for UC assessment included complying with the specified timeline for checking UC, and defining the exact time lapse between voiding events and checks for episodes of UI. Participants also found that fluid intake and urine output were not always measured accurately.

The questionnaire results showed that the two most important aspects of UC management which need attention were toileting time and frequency of changing continence aid. Scheduled voiding, with toileting assistance provided every two to three hours, has been shown to be effective because a voiding event commonly occurs every two hours (Ostaszkiewicz et al 2010). Providing toileting assistance at specific times was considered a positive strategy for effective UI management (Jirovec and Templin 2001). Although scheduled toileting based on toileting pattern was the purpose of UC assessment, only 40% of care staff reported providing toileting assistance according to the UC care plan.

The second most common strategy in UC management was providing toileting assistance when requested, which promoted individual autonomy and person-centred care; this was practiced by only about half of the questionnaire participants. This should be further promoted through improvement in the accuracy of UC assessment and management, and better time management.

Care staff were satisfied that UC care plans provided them with useful information about the allocation of continence aids. Once leakage from a continence aid was visible, the person was immediately at risk of

experiencing wet clothing, wet bed linen and skin excoriation. However, 26% of care staff in home 1 and 52% in home 2 changed a continence aid before it reached the full capacity (75% full), wasting continence aids. These results suggested that training for effective UC care needs to be enhanced in nursing homes.

There were limitations to this study. The results were based on self reports about UC assessment and management practices by care staff and their perceptions might have differed from actual practices. The response rate to the questionnaire was limited and it was not possible to cover all survey items in every nursing home. The areas of UC assessment and management explored in this study were mainly conducted by unregistered PCAs. Information about UC care collected from other sources, such as other healthcare providers, older people or family carers were not included. but we know from another review study that when UI occurs it causes a detrimental effect on the quality of life and psychological well-being of older people. Nevertheless, this report on perceived UC assessment and management practices in Australian nursing homes provides insight into priority areas for further UC care education and practice development.

CONCLUSION

This study found that there were areas where UC assessment and management in nursing homes could be improved. These included identifying the voiding times of older people, compliance with care plans in management practice, caregiver ability to assess the capacity of continence aids to absorb urine and time to change aids. The UC needs of older people were met primarily by scheduled toileting or upon request for UC assistance. Further research into strategies for effective caregiver education and practice development to address the identified UC care deficiencies is necessary.

IMPLICATIONS FOR PRACTICE

This study suggests that accuracy of UC assessment needs to be improved in nursing homes. Training and practice improvement is yet to be promoted to improve awareness among caregivers and older people about individual UC care needs and to provide person-centred UC care.

KEY POINTS

- The views and experiences of care staff about UC assessment and management practices in five nursing homes in Australia were reported.
- Most care staff conducted continence assessment in compliance with the guideline.
- There were difficulties for UC assessment in complying with the defined timeline for checking, and identifying the exact time lapse between voiding events and the checking for episodes of UI.
- Training needs to be provided on toileting time and frequency of changing continence aids.

REFERENCES

Australian Institute of Health and Welfare. 2011. Residential aged care in Australia 2009-10: a statistical overview. Accessed http://www.aihw.gov.au/WorkArea/DownloadAsset.aspx?id=10737421028

Centers for Medicare and Medicard Services.(2013). Long-term care facility resident assessment instrument user's manual Version 3.0. http://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/NursingHomeQualityInits/MDS30RAIManual.html (accessed 15.08.12).

Department of Health and Ageing. (2013). Aged Care Funding Instrument. Accessed 15.08.12 http://www.health.gov.au/internet/main/publishing.nsf/Content/ageing-acfi-userguide-july2013.htm (accessed 15.08.12).

Dowling-Castronovo, A. and Spiro, E.L. 2013a. Urinary Incontinence Assessment in Older Adults Part I – Transient Urinary Incontinence. http://consultgerirn.org/uploads/File/trythis/try_this_11_1.pdf (accessed 15.08.12).

Dowling-Castronovo, A. and Spiro, E.L. 2013b. Urinary Incontinence Assessment in Older Adults: Part II – Established Urinary Incontinence. http://consultgerirn.org/uploads/File/trythis/try_this_11_2.pdf (accessed 15.08.12).

Du Moulin, M.F., Hamers, J.P., Ambergen, A.W., Janssen, M.A. and Halfens, R.J. 2008. Prevalence of urinary incontinence among community-dwelling adults receiving home care. *Research in Nursing and Health,* 31(6):604-612.

Fonda, D., DuBeau, C., Harari, D., Ouslander, J.G., Palmer, M. and Roe, B. 2005. Incontinence in the frail elderly. In P. Abrams, L. Cardozo, S . Khoury, and A. Wein (ed.) Proceedings from the 3rd International Consultation on Incontinence, 2, 1163-1240. http://www.ics.org/Publications/ICI_3/v2.pdf/chap18.pdf (accessed 15.08.12).

Frantz, R.A., Xakellis Jr, G.C., Harvey, P.C. and Lewis, A.R. 2003. Implementing an incontinence management protocol in long-term care: clinical outcomes and costs, *Journal of Gerontological Nursing,* 29(8):46-53.

Fultz, N., and Herzog, A. 2001. Self-reported social and emotional impact of urinary incontinence. *Journal of the American Geriatric Society,* 49:892-899.

Hawthorne, G. 2006. Measuring Incontinence in Australia. http://www.health.gov.au/internet/main/publishing.nsf/Content/7F354DBFD2C9C565CA257210007F8DA6/$File/Meas%20Incont%20Aust%202006.pdf (accessed 15.08.12)

Jirovec, M.M. and Templin, T. 2001. Predicting success using individualized scheduled toileting for memory-impaired elders at home. *Research in Nursing and Health*, 24:1-8.

Martin, B. and King, D. 2008. Who Cares for Older Australians? A Picture of the Residential and Community-based Aged Care Workforce 2007. http://www.health.gov.au/internet/publications/publishing.nsf/Content/CA25774C001857CACA257512000423CB/$File/who%20cares.pdf (accessed 15.08.12).

O'Connell, B., Fonda, D., Day, K., Ostaszkiewicz, J., Hawkins, M., Gaskin, C. and Pinikahana, J. 2006. Development of screening and assessment tools for continence management in residential aged care. http://www.bladderbowel.gov.au/assets/doc/ncms/Phase1-2WorkforceSupport/RESI.pdf (accessed 15.08.12).

Ostaszkiewicz, J., Johnston, L. and Roe, B. 2010. Timed voiding for the management of urinary incontinence in adults. Cochrane Database Systematic Reviews, 1, CD002802. doi:10.1002/14651858.CD002802.pub2

Ostaszkiewicz, J., O'Connell, B. and Dunning, T. 2012. Residents' perspectives on urinary incontinence: a review of literature. *Scandinavian Journal of Caring Science,* 26(4):761-772.

Roe, B., Flanagan, L., Jack, B., Shaw, C., Williams, K., Chung, A. and Barrett, J. 2011. Systematic review of descriptive studies that investigated associated factors with the management of incontinence in older people in care homes. *International Journal of Older People Nursing*, 8(1):29-49.

Specht, J.K. 2011. Promoting continence in individuals with dementia. *Journal of Gerontological Nursing*, 37(2):17-21.

Specht, K.P., Lyons, S.S. and Maas, M.L. (2002). Patterns and treatments of urinary incontinence on special care units. *Journal of Gerontological Nursing*, 28(5):13-21.

Taunton, R.L., Swagerty, D.L., Lasseter, J.A. and Lee, R.H. 2005. Continent or incontinent? That is the question. *Journal of Gerontological Nursing,* 31(9):36-44.

Wagg, A., Potter, J., Peel, P., Irwin, P., Lowe, D. and Pearson, M. 2008. National audit of continence care for older people: Management of urinary incontinence. *Age and Ageing,* 37(1):39-44.