Australian Nurses Access and Attitudes to Information Technology – A National Survey

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Abstract

Competencies by nurses in information technology (IT) are essential to health care in Australia yet data suggest deficiencies in access and use. A study commissioned by the Australian Government aimed to determine the extent of access and use and the barriers to the use of IT among nurses across Australia. A survey was distributed to 10,000 members of the Australian Nursing Federation with a 43% overall response rate. Fewer than 15% of nurses did not use computers as part of their work. The greatest use was for client records, patient pathology and radiology results and professional development. IT uptake in health is supported by nurses who are, however frustrated by limitations to access and software that is not fit for purpose. A lack of confidence in using IT was noted by many nurses. Fewer than 20% had received pre-registration training in any aspect of IT and only 30% post registration. In addition to training, high work load, numbers of computers and inadequate technical support were the major barriers to computer use.

Keywords: *nurses, Australia, attitude to computers, computer literacy, training*

Introduction

Advances in information and communication technology are having a major effect on the health care industry. From patient care through to health system administration procedures are supported and in some cases driven by technology. This is illustrated by Australian Government strategy to implement the national electronic health records scheme Health*Connect*.

Most health professionals use computers for some aspects of their work and usage will only increase. Worldwide evidence indicates that there are many factors affecting nurses' access and use of information technology. Age, years nursing, home use and experience are just some of the knowledge based factors that have been identified. In addition to these factors are those which affect physical access to and use of computers in their workplace. Level of job, geographical location, sectors of employment, numbers of computers and employer policies are just some of the factors affecting access.

In order to advise policy and strategic planning at national, State/Territory, district and organisational levels it is imperative that the current situation with respect to nurses and information technology is known. With this purpose in mind the Australian Government through the Department of Health and Ageing commissioned a nation wide survey of nurses.

Objectives of the study were to:

- identify the extent to which nurses have access to and use information technology (IT) and information management systems (IMS);
- identify the purposes for which nurses use IT and IMS;
- identify the readiness of nurses to participate in e-health initiatives such as Health*Connect*;
- understand the barriers that prevent nurses from benefiting from IT and IMS;
- recommend ways to overcome these barriers and provide opportunities for nurses to better utilize IT and IMS within the Government policy framework; and
- prepare a roadmap for access, education and training to meet the needs of nurses

This paper reports on the methodology, results and implications of the study.

Methods

The study involved a postal survey of financial members of the Australian Nursing Federation (ANF) in July 2005. A stratified random sampling design was employed. The four strata employed were those designated by the Australian Standard

Geographical Classification (ASGC; major capital city, inner regional, outer regional, remote/very remote) [1]. In order to ensure adequate levels of precision in estimating key measures, 2500 nurses from each of the categories across all six States and two Territories were invited to participate, with an expected response rate of above 40%.

The survey tool was a questionnaire designed by the research team with considerable input from a variety of sources. More than twenty interviews were conducted with representatives from State/Territory Departments of Health, National Nursing Organisations, Nursing Informatics Organisations and Health Care Associations. Further input was obtained from a Focus Group consisting of representatives from 30 National Nursing Organisations and by the Project Steering Group. The questionnaire was piloted with nurses internal to the research centre and with a group of nurses attending a training program at an Australian Nursing Federation (ANF) branch.

The questionnaire consisted of 77 questions divided into the categories of Background, Access and Use of Computers, Uses of Information Technology, Access to the Internet, Knowledge of Health IT Initiatives, Job Requirements for IT, Training and Education in IT, Barriers to Use, Technical Support, Management Attitudes and Support, Security and Confidentiality and Professional Organisation Support.

The study was approved by the University Human Research and Ethics Committee. A Plain Language Statement outlining the study was enclosed with the questionnaires. Informed consent was implied if the participant completed the questionnaire and returned it for inclusion in the study.

Coded questionnaires were distributed to the ANF Branch offices for addressing and completed questionnaires bearing only a code number were returned to the research team.

Surveys were sent to 10,000 nurses. A reminder letter and a second survey were sent out a week after the three week deadline to all the nurses who had not responded.

The questionnaires were automatically scanned for entry of quantitative data using TeleForm (Verity Inc. Sunnyvale, California). One free text qualitative response question was typed in manually. All scanned questionnaires were verified for scanning errors and corrections entered manually.

Analysis was undertaken using SPSS on an item-by-item basis using descriptive and inferential statistical tools as appropriate to the scale of measurement. For the single qualitative question a thematic analysis was undertaken following standard methodology;

- studying each transcript individually as well as by sector to give a sense of the whole:
- identifying themes and categories that arose;
- developing summative themes and research findings from this analysis.

Results

Response rate

Over 4300 surveys were returned with an overall response rate of 43%. Response rate from each of the four ASGC strata were 23% Major Capital City (MCC), 28% Inner Regional (IR), 27% Outer Regional (OR) and 22% Remote/Very Remote (RVR).

Demographics of respondents

Background information about respondents is given in Table 1.

Table 1 – Background to respondents

Characteristic	Categories	% of respondents
Sex	female	92.8
	male	7.2
Age in years	Less than 25	2.4
	25-34	12.7
	35-44	27.9
	45-54	39.6
	55 and above	17.6
Job level	AIN/Carer	3.8
	EN	15.2
	RN1	33.3
	RN2	20.6
	RN3+	19.3
Type of contract	Full-time	42.8
	Part-time	45.3
	Casual	7.5
	Temporary	2.9
Type of Shift	All shifts	36.4
	Day	33.9
	Morning/evening	17.2
	Other	12.5
Principal Role	Carer	32.8
	Clinician	47.7
	Manager	11.3
	Other	8.2
Workplace	Hospital - public	54.0
	Hospital – private	7.4
	Community health	10.5
	Residential care	13.9
	Other	14.2
Type of Care	In patient	36.5
	Out patient	3.8
	In and out patient	21.9
	Residential	12.6
	Community health	13.2
	Other	13.5
Years as a nurse	Less than 5	8.8
	5-9	11.0
	10-15	11.3
	15-24	33.3
	25 or more	35.4

In the RVR areas there were proportionately more senior nurses, more clinicians, fewer carers and more full time nurses working in more public workplaces and in Aboriginal health services than other geographical areas. In the MCC there were more nurses employed in in-patient and in private facilities and fewer in community health than in the other areas.

Value of IT

The driving force for the adoption of IT was considered by the nurses to be office administration closely followed by patient/client administration. Only 14% of the respondents stated that they did not use a computer at all for work-related purposes. Of the 86% that did use computers for work over 90% considered that computer knowledge is essential for nurses working in today's health system and 80% acknowledged that use of IT had improved access to information. Fewer than 35% of respondents agreed that use of computers reduced errors and duplication and less than half considered that by using IT their work had been made easier.

Confidence in using IT

Respondents rated their confidence in using computers/mouse/keyboards as 30% *very confident*, 43% *confident*, 20% *a little confident* and 9% *not confident*. Nurses working in RVR areas were most confident and those in OR areas least confident in use of computers. Confidence levels with word processing or email were similar. However more than 25% of nurses stated that they have no experience with accessing resources for evidence based practice and of those who did 60% reported little or confidence.

Access to computers and IT

Nurses were asked where and how often they accessed a computer for work-related purposes. Nurses in RVR areas were more likely to use a computer for work related purposes (94%) than those in other areas (87%). Other findings are presented in Table 2. Over 60% of nurse who use computers for work do so at least once a week from home using email and internet access for the purposes of administration, communication, research and professional development. Only 28.5% of nurses had their own personal email address at work.

Table 2 - Frequency (%) of access to computers

	Never	Once a week	Once or more a day
At home	24.1	12.6	15.1
Own work based computer	49.2	2.7	32.0
Shared work computer	11.3	9.3	34.8
Work Library	68.8	1.0	.5

Asked why home computers are used for work related activities responses were workload, lack of sufficient access at work and no authorisation for the programmes needed.

Less than 5% of nurses reported that employer policy denied them access to a computer and a similar percentage indicated that their access was restricted. However authorization was required in 35% of the cases.

About 6% of nurses stated that there was no internet or intranet access and their place of work and a further 10% did not know whether their organisation had access or not. In work places where there was known access nurses reported their own personal access – 10% were not permitted access to the intranet and 18.3% to the internet.

Uses of Information Technology

Nurses were asked how often they used a computer for activities within the categories of patient/client management, clinical use, administration and other activities. Some key findings are presented in Table 3.

Nurses used IT most frequently for accessing patient records (RVR>OR), results (pathology, laboratory, radiology; MCC and IR>OR and RVR)) and professional development (RVR>MCC and IR). For no purpose did more than 50% of the respondents indicate they used a computer frequently or always. Clinical documentation and medication management were never used by two thirds of the nurses and a further 14% of nurses stated that these functions were not available to them.

Table 3 – Use of IT

	% of respondents		
	Never	Rarely/on occasion	Frequent /always
Accessing patient records	28.3	20.2	43.9
Appointments	58.2	14.2	16.3
Patient assessment	48.5	12.2	27.6
Clinical documentation	66.6	6.5	13.3
Medication management	67.1	8.4	10.3
Results	32.9	18.3	41.1
Accessing policy	22.7	38.4	34.2
Evidence based practice	27.7	37.5	27.3
Administrative reporting	46.0	13.6	27.9
Staff management	53.3	11.3	22.1
Professional development	17.7	41.8	36.7

Less than 5% of nurses use a PDA or tablet computer (MCC>IR, OR). Telehealth/telemedicine had been used by 29% of nurses although only 5% on a frequent/always basis (RVR>OR>IR>MDD). MIMS online was used by 69% of nurses but only 17% used it on a frequent basis and 6% always (MCC and IR>RVR). Less than half of the nurses had ever accessed resources from Joanna Briggs Institute for Evidence Based Practice or the Cochrane Library (RVR>MCC) and 40% had never accessed an on line journal. State health department information access or knowledge based systems such as the Clinical Information Access Program (CIAP) in New South Wales had been accessed by less than 40% of the nurses (RVR>IR, OR).

Knowledge of Current Health IT initiatives

Over two thirds of those surveyed believed that adoption of a national electronic health record scheme would be beneficial to health care and yet 51% of respondents indicated that they had never heard of Health*Connect*, the Australian Government electronic health record scheme currently being trialled. Of the 47% who had heard of it only 4% indicated that their knowledge was better than average.

Job Requirements for IT

Thirty-five percent of nurses who have to use IT in their job stated that there was a requirement for IT skills in the job description. Less than 1% reported receiving any financial reward for their use of IT. The importance (*very* or *somewhat*

important) of IT in choice of current employer was stated by 14% of respondents, however 35% noted that access and use of IT would influence their decision to remain in the current job. Moreover half of the respondents said that access and use would influence choice of future employer.

Training and Education in IT

The survey contained a number of questions exploring training and education in IT from pre-registration through to future requirements. Some of the findings are presented in Table 4.

Table 4 – Training and Education

	Time of training relative to nursing registration	
	Pre	Post
Computer skills	14.4	24.9
Word processing	13.5	29.8
Email	11.7	29.3
Internet	12.2	23.8
Patient management	7.5	25.7
Information management	3.8	13.0

Very few nurses had received pre-registration training in IT skills. This was related to year of graduation. Post-registration training had been received by up to 30% of nurses. Nurses working in RVR areas were more likely to have undertaken post registration training than nurses working in MCC.

For those who had received post registration training over half had been undertaken in a group format with a commercial trainer either at the work place in work time or away from the work place in their own time. Although 38% stated that IT training was encouraged in the workplace 53.8% stated that it was never referred to. Three quarters of the respondents would train towards a national computer competency standard if it was offered but only 27.4% would be interested in a university health informatics course.

More than 75% of the training was considered to meet the needs of the current job and given at an appropriate time to its use in the workplace. Between 30 and 50% of nurses indicated the need to undertake training in specific skills ranging from basic computers skill to use of patient management systems to better meet the requirements of their jobs.

There was a diversity of views as to the question that the level of computer literacy was restricting career development (26.3% *Yes*, 41.8% *No*, 31.9% *Neither agree nor disagree*).

Barriers to Training in IT

A number of barriers that prevented access to training in IT were offered. Time (55.4%) and lack of relief staff (61.6%) were the major ones. Lack of interest was only indicated by 12% of participants.

Barriers to Use of IT

The survey included a list that was generated from interviews and focus groups as factors that may restrict computer used in the work place. Table 5 gives the key results from 21 factors.

Computer access affected about 20% of the respondents and a similar percentage identified their knowledge of IT and confidence in use. Age, interest and concerns about health and safety were clearly stated by the nurses as not being barriers to use. The greatest barriers were related to work demands; either too many other demands or conflicting demands.

Table 5 - Barrier to use of IT

Barrier	Never	Rarely/ sometimes	Often/ always
Not enough computers	31.8	43.5	24.8
Location of computer	43.1	37.6	19.2
Too much other work	11.4	33.1	55.5
Age of nurse	78.2	17.4	4.4
IT knowledge	31.2	48.7	20.2
Confidence	33.4	48.8	17.9
No interest	70.7	25.1	4.2
Health & safety concerns	86.4	12.5	1.2

Nurses from OR areas identified knowledge and confidence to be a greater barrier than did nurses working in MCC.

Management and Technical Support

Participants were asked about the level of technical support available to them should problems arise with computer hardware or software

Around 55% of nurses knew their organisation had policies to deal with technical issues. Only 6% stated that there were no policies in place, however 39% did not know if there were policies or not. In-house technical support during working hours Monday through Friday predominated over contracted or organisational (e.g. health service) support. Very little support (<10%) was offered out of day-time hours or weekends although this out of hours support was more likely in MCC than in other areas. Technical support was considered to be a barrier to computer use with 32.8% stating it was a barrier *sometimes*, 15.1% *very often* and 7.2% *always*.

About a third of the respondents (36%) considered that management were poor or awful in consultation to ensure that computers and applications were best suited to practise.

Security and confidentiality

The vast majority of nurses (90%) believed that the level of security of confidential patient information in the work place was *good* or *excellent* and that work place policies on security and confidentiality were also *good* or *excellent*.

Discussion

The presence of computers in the nursing work place is evident by the 90% of nurses who use them in the every day working activities. Familiarity, confidence and use of computers by the majority of nurses were evident. Confidence dropped with generic software and applications such as email.

The value of IT in health was recognised by the nurses although they were frustrated by lack of integration of systems into their working life. One of the results of this deficiency was duplication of effort which was a common theme in interviews and focus groups.

The importance of skills and knowledge in IT was demonstrated in direct responses to questions and through response to influence of access in their employment tenure and choice of future jobs.

Work demands required nurses to do work at home. This concurs with a previous study where nurses indicated that they were unable to complete their work in time allocated [2].

It would appear that the use of IT by nurses for provision of health services has still got a long way to go. Although programmes supporting patient management, clinical use and administration are evident the number of nurses reporting that they never or rarely use them is high. A third of nurses do not use computer based patient records or use a computer to access results. Moreover over half do not use computers as part of patient assessment and documentation.

Royal College of Nursing Australia noted that the "quality of nursing [is] improved with evidence based practice" [3]. However evidence based practice is only used by a quarter of the nurses with any frequency. The majority of nurses had never accessed resources from JBI, Cochrane or their State/Territory information or knowledge based systems. This lack of knowledge, use and confidence in the use of evidence based practice resources is of concern as this is touted as the nursing principle of the future. If that is to be the case it would appear that considerable training is required.

A damming indictment of government information transfer was demonstrated in the response to questions about knowledge of health initiatives. Despite already being trialled in a number of locations [4] nurses, who undoubtedly will be major users of Health*Connect* had little or no knowledge of its existence.

Training opportunities were offered by employers and the training was considered to be appropriate and timely. However only a quarter of nurses had undertaken training and barriers were, more often than not, workload and time. These factors must be addressed if today's nurse is going to meet the expectations outlined in policy.

Restrictions to use of computers in the work place provided confirmation of some of the previous responses by the nurses. Age which has been suggested as a barrier clearly is not considered to be so. Nor are interest and concerns of health and safely. Access to a computer affects some nurses. However the biggest barrier, once again, is related to workload and prioritisation of time [2].

Technical support was raised as an issue by many nurses and the overwhelming conclusion was that improvements are necessary particularly in the availability out of day-time hours. Technical support that is restricted to 9-5 on weekdays and not offered for 75% of the time is clearly not a satisfactory arrangement.

Nurses are also not satisfied with the degree of consultation with management prior to implementing new applications. Until nurses are engaged in the process prior to implementation this situation with not improve.

Security of patient information was expressed by some of those people interviewed to be a concern with the advent of more IT. Computer hacking being one frequently used term. The surveyed nurses, however, did not appear to share this view with the vast majority confident that policy and practice were *good* or *excellent*.

Conclusion

Nurses see the benefits of IT, however, they do not believe that the potential benefits have been realised. They have no fear of computers and are confident in using them. Lack of training is evident and the move to evidence based practice will not result until more attention is placed on IT training and support. Although employers offer training, until workload and time allocation issues are addressed, nurses will not be able to take advantage of this training.

In addition to addressing this issue it is suggested that management engage nurses more in decision making processes with respect to IT adoption.

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