



Internet usage and openness to internet-delivered health information among Australian adults aged over 50 years

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RESEARCH

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Background

The cost of healthcare in Australia's ageing population is ever increasing. In an attempt to reduce these rising costs, the internet has been suggested as a possible means of disseminating health-related information and promoting preventive health behaviours.

Objective

Our objective was to determine the proportion of Australians aged 50-74 years who have internet access, and the characteristics of internet usage, current online health information seeking behaviour, and the willingness to receive unsolicited health information via the Internet.

Method

A random sample of $N=25,511$ urban older Australians aged 50 to 74 years received a questionnaire via mail and were asked to complete questions concerning variables related to internet usage. $N=8,762$ returned a completed

questionnaire.

Results

Eighty-two per cent of respondents reported having internet access, mainly at home (94%), and the majority actively use this technology (93%). Younger people and those of higher socio-economic status and higher education were more likely to have access ($p<.001$). Approximately 61% reported actively seeking health-related information online but only 32% expressed a willingness to receive unsolicited health information via the internet. Females were more likely to currently search for health-related information than males but were less likely to be open to receiving unsolicited health information (both $p<.001$).

Conclusion

According to the data it appears the majority of urban Australians aged over 50 have access to the internet at some location and 60% of them use the internet for health-related purposes. The data also suggests, however, that delivering health information via the internet alone would disadvantage those who are older, less educated, and less financially well-off.

Key Words

Internet Usage, Personalised Decision Support, Cancer Screening

What this study adds:

1. This study shows a marked increase in internet usage in older Australians compared to previous literature
2. These analyses indicate that over 60% of older Australians use the internet for health-related purposes
3. Despite the moderate usage of the internet for health related purposes, most participants indicated they would



not accept unsolicited health information delivered via this medium.

Background

Globally, the population of older people aged 60 years and over is growing rapidly, at a rate of approximately 2.6% per annum. This is more than 117% higher than the growth rate for the population as a whole, which is only 1.2%. Interestingly, the growth rate of this older population is substantially increased in developed regions including Asia and Europe who will have less time to adjust to the consequences of population ageing.¹ In Australia, the proportion of the population aged over 65 will increase from 9% to 13% over the next four decades and the number of people of working age for every person aged over 80 will decrease from 16.3 to 5.5.²

The burgeoning ageing population has led to concern in both Government and Private sectors regarding the associated rising cost of providing adequate healthcare.³ By 2050 government expenditure on health care in Australia will increase threefold from around 3% of total revenue to 9%.² The number of informal carers available to assist older people will drop by over 60% and this will increase the costs associated with aged care facilities.² In an attempt to help curb these rising costs health care providers have become increasingly drawn to the internet as an efficient yet cost effective means of delivering health services and information.⁴ There currently exists an extensive amount of information and interactive services on the internet and in light of global objectives to promote independent living and a focus on preventative health,² 'healthy lifestyle' websites have also become more apparent.⁵

According to the research literature, older adults – generally defined as being 50 years or older – use and enjoy computers and the internet, and their enthusiasm for Information Technology (IT) is growing rapidly.⁶ Key reasons for this include that use of IT enhances quality of life through improving communication with family and friends – thus expanding social support networks – and by assisting in the maintenance and promotion of friendships.⁷ Internet use also enhances independence by connecting users to online services such as banking, shopping, library borrowing, and social chat groups³ and computers are used successfully in a variety of living settings from fully independent through to institutional care settings.⁷

Ultimately, the potential success of internet delivered health information and services as a means of reducing rising health care costs will be governed by the number of

people in the targeted population that utilise this technology, and whom are willing to receive/access health related information via this medium. Consider Colorectal Cancer Screening (CRC) as a case study. The target population for CRC screening is asymptomatic persons aged 50 years and over. Due to the significant health burden of this disease the Australian Government is gradually rolling-out free CRC screening through the National Bowel Cancer Screening Program (NBCSP). In 2008 alone the NBCSP – in its very restricted format – mailed over 685,000 Australians a Faecal Occult Blood Test and associated screening related information.⁸ During the course of this public health initiative the NBCSP has identified the need to develop cost-effective methods of communicating the benefits of CRC screening given the potential magnitude of the programme if screening was offered biannually to all Australians aged >50 years.⁹ Internet-based cancer screening decision aids have been a suggested cost-effective means of communicating the benefits of CRC screening as well as other preventative health activities.¹⁰

Current estimates regarding the actual proportion of those aged >50 years who use the internet vary widely, although it is accepted that the figure is growing rapidly.⁵ Previous research by our team has shown that in South Australia, 59% of people aged 50 and over use the internet, mostly from their homes (89%), and around 66% of internet users are willing to receive health information online.¹¹ Australian Bureau of Statistics data shows that usage rates in those aged 50 to 64 is more than twice as high (63%) than in those aged 65 or older (31%).¹² Moreover, although internet usage decreases sharply with age, it has increased by over 400% in those aged >65 years in the last decade; rising from 6% in 1999,¹³ to 31% in 2009.¹²

Given the ever changing nature of internet usage in ageing Australians and the desire to increase the use of this technology in health management in older adults, the aim of the present study was to continue to track internet accessibility and usage in those aged >50 years. Collecting data regarding internet usage rates will help to ascertain the potential utility of online health tools such as a CRC screening decision aid, for example. In addition to this the study also aimed to collect information regarding the location of internet access, the proportion that currently actively search for health related information using the internet, and the proportion of internet users who might accept unsolicited health related information via the internet.

Method

This study was approved by the Commonwealth Scientific



Table 1: Characteristics of participants according to internet access status (N=8,762)

		Internet Accessibility			
		Yes		No	
		N	%	N	%
SEX	Male	3509	83.7%	685	16.3%
	Female	3716	81.3%	852	18.7%
	50-54	1898	92.1%	163	7.9%
AGEGROUP	55-59	1876	90.1%	207	9.9%
	60-64	1649	82.8%	342	17.2%
	65-69	1149	74.3%	398	25.7%
SEIFA ¹	70-74	653	60.5%	427	39.5%
	Lower	1718	71.7%	677	28.3%
	SEIFA Higher	5507	86.5%	860	13.5%
EDUCATION ²	SEIFA School	2581	69.3%	1144	30.7%
	Only Higher Education	4623	92.5%	377	7.5%
	Other	2865	71.0%	1169	29.0%
EMPLOY- MENT ³	Employed	4325	92.4%	354	7.6%

¹SEIFA=IndexofRelativeSocio-economicAdvantageandDisadvantage. Groupssplit ataverageAustralianSEIFAscoreof1000points.

² School includes primary and secondary education; Higher Education includes certificates, diplomas, bachelor degrees and all other post-school qualifications (N=8,725duetomissingvalues)

³ 'Employed'includesFull-TimeandPart-Time;'Other'includesretired,homeduties andunemployed(N=8,713duetomissingvalues)

and Industrial Research Organisation's (CSIRO) Human Research Ethics Committee.

Design

This study utilised a descriptive research design in order to describe the behaviour of older Australians with regard to their access to and usage of the Internet.

Sample Size

In order to calculate minimum sample size requirements for descriptive research designs, we used the method for estimation based on observed proportions described elsewhere.¹⁴ Assuming an internet usage rate of 59% as reported previously (11) with $\pm 2.5\%$ deviation either side of this, and a critical *p* value of 0.01, the minimum number of participants required for reliability is *N*=2,586.

Sampling

N=25,511 Australians aged between 50 and 74 years were identified from the Australian Electoral Roll. Study invitees

resided only in urban electoral divisions in New South Wales (6,213), Queensland (4,595), South Australia (4,654), Victoria (5,287) and Western Australia (*N*=4,762). The total invited participant pool was reduced to *N*=25,057 after excluding those who were medically unwell (*N*=17), did not reside at the recorded address (*N*=343), would be absent due to travel (*N*=8), were deceased (*N*=20), or who cited other (*N*=14) or no reason (*N*=52) for not being able to participate in the survey.

Data Collection

All study invitees received a short questionnaire and a letter requesting their participation in a larger randomised controlled trial¹⁰ concerned with cancer screening. The questionnaire collected demographic information as well as data concerning: 1) access to the internet, including location of this access; 2) whether the internet was actively used; 3) whether the internet is currently used to search for health related information; and 4) willingness to receive unsolicited health related information via the internet in the future. The letter indicated that the trial related to screening behaviour in general and no further information was given regarding the actual cancer of interest or what the eligibility criteria were for inclusion. Participants implied consent to participate by completing and returning the short questionnaire. As an incentive, all participants who returned the questionnaire were entered into a draw to win one-of-three \$200.00 grocery-shopping vouchers.

Data Management

All returned surveys were entered into a custom database using SIR2002 data entry software.¹⁵ Surveys were then double-entered by a second researcher for verification purposes. After all surveys were double-entered, the data were cleaned and de-identified for analysis using SPSS version 18.¹⁶

Results

Of the *N*=25,057 participants invited to participate in the study, *N*=8,762 returned a completed questionnaire resulting in a participation rate of 35%. Frequencies analysis showed that 82% (*N*=7,225) of survey participants reported having access to the internet at some location and 93% (*N*=6,709) of these individuals reported actively using the internet. Table 1 provides a breakdown of internet access according to demographic characteristics and, generally speaking, it appears that internet accessibility is highest in younger people, and those of higher education and higher socio-economic status.

Regarding those with internet access, 94% (*N*=6,801) reported having access at home, 38% (*N*=2,728) at work and



Table 2: Logistic regression analysis of predictors of internet access and openness to receiving online health related information (N=8,684 for both models)

Variable	Groups	HaveInternetAccess			OpentoOnlineHealthInformation		
		OR	95% CI	Sig	OR	95% CI	Sig
SEX	Male	1	-	-	1	-	-
	Female	0.97	0.85-1.10	0.60	0.8	0.73-0.88	0.00
AGE GROUP	50-54	1	-	-	1	-	-
	55-59	0.88	0.70-1.10	0.26	1.15	1.01-1.30	0.03
	60-64	0.63	0.50-0.78	0.00	1.11	0.98-1.27	0.11
	65-69	0.47	0.38-0.59	0.00	0.97	0.84-1.14	0.75
EMPLOYMENT	Other	1	-	-	1	-	-
	Employed ¹	2.57	2.20-3.00	0.00	1.34	1.20-1.49	0.00
SEIFA	Lower SEIFA	1	-	-	1	-	-
	Higher SEIFA School	2.13	1.88-2.43	0.00	1.1	0.99-1.21	0.08
EDUCATION	Only	1	-	-	1	-	-
	Higher Education ²	3.98	3.48-4.55	0.00	1.44	1.32-1.58	0.00

OR=OddsRatio

6% (N=430) at 'other' locations. About one-third of the participants (36%, N=2,572) reported having access at more than one location. For those who reported having access at one location only, 91% (N=4,229) reported this access to be at home, 5% (N=241) reported access at work and 3% (N=156) reported only having access at 'other' locations. The most commonly reported places of 'other' internet access locations included public internet sites (33%) such as libraries and internet cafes, on a mobile phone (25%), and at a relative's house (17%).

For those who reported having access to the internet, 61% (N=4,377) indicated that they currently use the internet to search for health related information. Irrespective of internet accessibility, 38% (N=3,355) of the sample indicated that they were interested in receiving unsolicited health related information via this technology. Only N=5 of these respondents did not currently have access to the internet.

Following the descriptive analyses, logistic regression was performed in order to identify predictors of internet access and willingness to receive unsolicited health related information via the internet. Results of this analysis are reported in Table 2. As can be seen, the odds of having access to the internet generally decreases as age increases. Furthermore, although sex was not predictive of internet access, higher employment, higher SES status and higher education all increase the odds of having access. The overall fit of this model was statistically significant [$\chi^2(8) = 1546.34, p<.001$] and the predictor variables explained around 20% of the variance in internet access [Cox and Snell $R^2=.16$, Nagelkerke $R^2=.27$].

In regards to the second model examining openness to online health information: Compared to participants aged 50-54 years, those aged 55-59 were more likely and those aged 70-74 less likely to be open to receiving online health information. Sex, education level and employment status were also related. Females, were less likely than males to want to receive this information whilst those who were employed and of higher education were more likely to be open to receiving this information. The overall fit of this model was statistically significant [$\chi^2(8) = 239.50, p<.001$] and the predictor variables explained around 4% of the variance in internet access [Cox and Snell $R^2=.03$, Nagelkerke $R^2=.04$].

Table 3 presents the results of a logistic regression with current online health searching behaviour as the dependent variable. Results of this analysis show that up to age 64, there are no significant differences in regard to this behaviour, although odds of searching for online health information are significantly lower from age 65 onwards. Higher education does increase the odds of searching for health related information and females are also more likely than males to participate in this behaviour. The overall fit of this model was statistically significant [$\chi^2(8) = 265.84, p<.001$] and the predictor variables explained around 5% of the variance in this self-reported behaviour [Cox and Snell $R^2=.04$, Nagelkerke $R^2=.05$].

Discussion

The rising cost of public health care in an ageing population is a major concern for Government and Private industry in many developed countries. Consequently, there is increasing demand for the development of ill-health prevention programs and methods of communicating health related information in a cost effective manner. The internet has been considered as a possible tool to aid in meeting these challenges.^{10,11} As already noted, the utility of internet-based health delivery is likely dependent upon the



number of people who use this medium and who do so with regard to their health.

Results of the current study suggest that, at least for survey respondents in our study, internet access in those over 50 years of age is remarkably high (82%) and larger than estimates based on Australian population data collected in 2008.¹² Importantly, nearly all those with access (93%) report that they actively use this technology. This supports the widely held view that internet usage in older people is growing^{5,11} and probably more so than among younger age-based cohorts.

In the present study, of those who reported actively using the internet, over 60% employ this technology to seek out health related information. However, a much smaller proportion (38%) indicated a willingness to receive unsolicited health information via the internet. One example of unsolicited information might be the cancer
 Table 3: Logistic regression analysis of predictors of current online health information-searching behaviour (N=7,174)

Variable	Group	Currently searches for online health information		
		OR	95% CI	Sig
SEX	Male	1	-	-
	Female	1.58	1.44 - 1.75	0.00
AGE	50-54	1	-	-
	55-59	0.95	0.83 - 1.09	0.46
	60-64	0.92	0.80 - 1.07	0.29
	65-69	0.68	0.58 - 0.81	0.00
	70-74	0.52	0.42 - 0.64	0.00
EMPLOYMENT	Other	1	-	-
	Employed	0.92	0.82 - 1.04	0.18
SEIFA	Lower	1	-	-
	Higher	1.11	0.99 - 1.24	0.07
EDUCATION	School	1	-	-
	Only	1	-	-
	Higher Education	1.69	1.52 - 1.87	0.00

OR = Odds Ratio

screening information that is distributed together with a CRC screening kit as part of the NBCSP. The absence of a desire in our participants to receive such correspondence highlights the potential problem of distributing health information in this manner. The proportions reported herein indicate that people would much rather actively seek out health information themselves than have it forwarded to them.

In regards to those who are willing to receive unsolicited information, it is beneficial to consider their motivations. It could be the case that these individuals suffer from illness or disease and might therefore be more accepting of this type of information, especially if relevant to them. Further studies should address this issue as well as explore in more depth the types of unsolicited information available such as government versus private industry. Indeed, the origin of unsolicited health information may act as a moderating variable with respect to whether individuals would be willing to receive it.

The present results continue to support the notion of a 'Digital Divide' reflecting inequalities in access to the internet.^{3,7} Despite the apparent increase in internet accessibility in general, it continues to decline significantly as age increases, and education level and socio-economic status decrease. However, the relation of these demographic data to current health related internet-searching behaviour and also openness to internet-delivered health information does not mirror this pattern. Age, for example, is not largely predictive of either of these and neither is SES. Furthermore, although females are significantly more likely to search for health information online than males, they are significantly less likely to want to have unsolicited information forwarded to them.

Limitations of the present study include that only those residing in urban residential areas in the main Australian states were surveyed. This might have consequently resulted in the higher than expected internet access rates reported herein, and it is certainly plausible that older Australians residing in more regional and/or rural areas might not have the same level of access to this technology. Future studies should therefore explore the differences between such areas and whether or not the usefulness of, and desire to receive online health information, is impacted by locality, for example. Given also that a large proportion of invited participants did not return a completed survey, we cannot be sure that internet accessibility in individuals who did not complete the survey is comparable to the proportions reported herein.



Conclusion

Access and usage of the internet will probably not be the sole determinant of the effectiveness of internet delivered health information and services. Instead, the success of these methods might depend on their general acceptance by the relevant target populations. Around 40% of the internet users in the present study do not use the internet in relation to their health and an even smaller proportion of users have a desire to do so; at least in terms of receiving unsolicited health related information in this manner. Using the internet as the only, or primary means of disseminating health information would thus likely increase disparities in health outcomes, given the inequality in access to this technology and an apparent lack of desire to use it in this regard. At best, the ability to deliver health information and programmes online should be considered a useful adjunct to current paper-based approaches, although it is probable that a generational shift might result in these methods becoming more effective as younger generations who are more familiar with this technology enter the later years of their lives.

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CONFLICTS OF INTEREST

The author(s) declare that they have no competing interests

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ETHICS COMMITTEE APPROVAL

CSIRO Human Research Ethics Committee