ORIGINAL RESEARCH

Where do older Australians receive their health information? Health information sources and their perceived reliability

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Abstract

Background: Chronic disease prevalence is increasing, in part due to the ageing population, adding further pressure to Australia's over-stretched primary health care services. While patients are encouraged to self-manage their chronic disease(s) in order to minimise the impact on their day-to-day functioning, little is known about where older adults receive health information and their perceptions of the reliability of these sources. Such knowledge would facilitate the development of self-management support strategies using health information sources that are acceptable to older adults.

Methods: A cross-sectional design was utilised to investigate where older adults receive their health information and their perceptions of the perceived reliability of these sources. A paper-based survey was completed by 4,066 randomly selected adults (response rate = 46.8%) aged 55 years and older, who were resident in New South Wales, Australia.

Results: Doctors (96%), pharmacists (60%) and the Internet (24%) were the most frequent providers of health information. Less than one-fifth of respondents reported having received health information from a nurse (18%). However, the health information sources perceived to be the most reliable were doctors (98%), pharmacists (74%) and nurses (34%).

Discussion: Our results suggest that in Australia older adults primarily use doctors as a source of reliable health information and that nurses are under utilized in the provision of health information. The reasons for this need to be further investigated to ensure that nurses play an optimal role in the primary health care team. Although the Internet proved to be a popular source of health information, levels of perceived reliability were comparatively low. Future research should investigate whether the promotion of credible websites by health care professionals can overcome this barrier.

Key words

1 Introduction

In Australia it is projected that by 2051 more than one in four people will be aged over 65 years [1]; a potential doubling of the current older adult population. As chronic diseases prevalence increases as people age [2, 3], this will result in a rise in the burden of chronic disease, which in turn will lead to an increasing number of General Practitioner (GP/Family

Physician) encounters and a greater number of health problems being presented at each encounter. GPs are already reporting working under mounting pressure caused, in part, by the rising number of older patients with chronic disease(s) [4]. Some of the factors identified which contribute to this pressure include lack of funding, lack of time and lack of space in which to provide chronic disease self-management support [5].

Chronic disease self-management encourages patients to be actively involved in the management of their disease(s). This encompasses managing their symptoms and treatment as well as reducing the impact of their illness on their lifestyle [6, 7]. Effective self-management requires patients to work in partnership with their family, carers and healthcare provider(s) to manage their disease. The Australian National Chronic Disease Strategy describes self-management as supporting the patient to:

(1) understand the nature of their illness including risk factors and co-morbidities,

(2) have knowledge of their treatment options and be able to make informed choices regarding treatment,

(3) actively participate in decision making in partnership with health professionals, family and carers and other supports in terms of continuing care,

(4) follow a treatment or care plan that has been negotiated and agreed with their health care providers, family and carers and other supports,

(5) monitor signs and symptoms of change in their health condition and have an action plan to respond to identified changes,

(6) manage the impact of the disease on their physical, emotional and social life and have better mental health and wellbeing as a result,

(7) adopt a lifestyle that reduces risk and promotes health through prevention and early intervention, and

(8) have confidence in their ability to use support services and make decisions regarding their health and quality of life [3].

It is clear that individuals need to have a broad skill base in order to maximize their quality of life through self-management. These skills include: communication, information seeking, analysis and decision making – which, in turn, necessitates access to reliable health information. However, little is known about where older Australians receive their health information or what sources they perceive as reliable.

Despite access to health information being central to chronic disease self-management, little reference to health information sources could be identified in the literature, with only one research paper from 1989 that looked at age [8]. This is surprising as it can be assumed that older adults would have a greater need for health information than other age groups, as people tend to develop more health issues as they age. The other papers identified were specific to cancer patients [9, 10], focused solely on the Internet as a source of health information [11-14], or examined provision of information about prescription drugs [15]. Improved knowledge regarding the health information sources used by older adults has health promotion implications, as it can be used to increase access to health information.

This paper explores the effects of demographic variables - age, sex, level of education attained and household income - on health information sources used by older adults, and their perception of the reliability of these sources. Such knowledge can be used in the future provision of self-management support through health information sources that are both used and trusted by the target population. This information will become even more pertinent as the population continues to age and the burden of chronic disease increases.

2 Subjects and methods

This study utilised a descriptive, cross-sectional design to investigate where older adults receive their health information and their perceptions of the perceived reliability of these sources. A paper-based survey was developed to examine the beliefs and attitudes of older adults towards asthma. The survey was reviewed by experts in the field of asthma to ensure face validity. Cognitive interviews, using the think-aloud technique, were conducted with a convenience sample of 13 older adults, to ensure that the questions were interpreted correctly [16, 17]. The researchers visited participants in their homes and recorded all interviews. The participants were asked to read the survey questions and response options out-loud and to explain their thought process. As a result of this process survey questions were re-ordered and the survey format was altered. The survey was subsequently piloted with a second convenience sample (n=115) accessed through community groups or whilst they were travelling on public transport. This pilot study led to further survey refinements such as changes to response scales in order to minimise question skipping and missing data.

The final survey contained three items related to health information sources. The first item asked respondents "Which of the following sources have you used to obtain health information?" - GP/doctor; nurse; pharmacist; relative/friend; brochures/pamphlets; Internet websites; magazines; television; newspapers; and radio. A second item asked respondents to identify "Which of the following sources of health information would you rate as reliable (providing accurate information)?" An open-ended question was used to explore why participants felt sources were or were not reliable.

2.1 Recruitment and sampling

In October 2010, the survey was mailed to 9,000 people aged 55 years and over, living in three discreet regions of New South Wales, Australia, whose details had been randomly selected by the Australian Electoral Commission. The areas included metropolitan, regional and remote locations. Participants were sent a package containing: a letter explaining the research, a survey form, and a reply paid envelope. Reminder postcards were mailed out after three weeks and a second copy of the package was sent out four weeks subsequently. This amended version of Dillman's tailored design method was used to optimise the response rate [17]. Surveys were coded to avoid unnecessary contact with those participants who had already responded. Ethics approval was obtained from the University's Ethics Committee; consent to participate was implied by the return of the survey.

2.2 Data analysis

The survey data were entered and analysed in SPSS v. 17. To check the data entry accuracy, five percent of responses were re-entered, yielding an error rate of 0.175%. Pearson's chi-square tests were initially run to assess differences in the use of the various health information sources. Hierarchical log-linear analyses were subsequently used to investigate the impact of demographic variables (age, sex, level of education achieved and household income) on use of each health information source (doctors, nurses, pharmacists, relatives, brochures, websites, magazines, television, newspapers and radio).

Pearson's chi-square tests were also conducted to investigate differences between the perceived reliability of each health information sources. Chi-square tests for goodness of fit allowed the examination of the perceived reliability of the health information provided by health care providers. Hierarchical log-linear analyses were then used to investigate the impact of demographic variables (age, sex, level of education achieved and household income) on the perceived reliability of each health information source (doctors, nurses, pharmacists, relatives, brochures, websites, magazines, television, newspapers and radio). Cohen's w was calculated as a measure of effect size, providing a measure of the strength of the relationship between the variables [18].

Responses to the open ended question were explored using Leximancer v3.5, a text analytics tool which produces theme and concept maps from text based documents [19]. The data were exported into Microsoft Word. A spell check was run and abbreviated words were replaced (e.g. Dr was replaced with doctor). The file was then opened in Leximancer and a thematic map produced. Because the responses being analysed were from a short-answer survey both 'sentences per block'

and 'concept learning settings, phrase separation' were reduced to one. The following concepts were merged: 'info' and 'information'; 'doctor' and 'GP'; and 'nurse' and 'nurses'. The terms 'usually' and 'etc' were removed. The thematic map was developed several times to ensure concept stability [20].

3 Results

A total of 4,066 eligible surveys were returned (response rate of 46.8%). The mean age of respondents was 67.9 years (SD=9.01; range =55-96 years), with slightly more females (54.8%) than males. Six percent of respondents spoke a language other than English at home.

3.1 Health information sources

Table 1 summarises the percentage of respondents receiving health information from each source and their perceived reliability of each sources. Doctors (96%) and pharmacists (60%) were most frequently used to obtain health information and were also perceived to be most likely to provide accurate health information (98% and 74% respectively). The radio was the least frequently reported source of health information (11.6%). Few people reported perceiving health information gained from media sources as reliable: television 6.3%, radio 4.8%, magazines 4.3% and newspapers 4.3%.

Table 1. Summary of health information sources and perceived reliability (n= 4066)

Health Information Source	Source used (%)	Perceived as reliable (%)	Source used & perceived as reliable (%)	Source used & not perceived as reliable (%)	Source not used but perceived as reliable (%)	Source neither used nor perceived as reliable (%)	Chi-square test p value
Doctors	95.8	97.9	95.1	0.7	2.8	1.3	.000
Pharmacists	59.6	73.9	56.4	3.2	17.5	22.9	.000
Internet websites	24.5	13.7	11.5	13.0	2.2	73.4	.000
Brochures /pamphlets	23.4	15.6	11.4	12.0	4.2	72.4	.000
Television	19.7	6.3	5.3	14.4	1.0	79.3	.000
Nurses	17.8	34.1	15.4	2.4	18.7	63.6	.000
Magazines	15.8	4.3	3.6	12.2	0.7	83.5	.000
Relatives /friends	15.1	6.3	5.2	9.9	1.1	83.8	.000
Newspapers	14.7	4.3	3.5	11.2	0.8	84.5	.000
Radio	11.5	4.8	3.8	7.7	1.0	87.4	.000

Pearson's chi-square test results indicated a significant difference ($p < .001$) in use of each health information source. Hierarchical log-linear analysis showed that demographic variables were found to have a statistically significant impact on choice of health information source (see Table 2). The use of doctors as a health information source was only associated with age, with those aged over 75 years significantly less likely to have received health information from doctors than respondents in other age groups ($p = .007$). While respondents who had completed tertiary education were significantly more likely to have used nurses as a health information source ($p = .000$). The use of both friends/relatives and newspapers were significantly influenced by all variables except age (sex, $p = .019$; education $p = .037$; and household income $p = .037$); whereas the use of brochures and the television for health information was impacted by all variables except income. The results indicate that the use of some health information sources was impacted by the combined effect of two or more demographic variables. Some of these results were highly significant ($p < .01$): both age and education impacted the use of

doctors as a health education source ($p = .005$); and age, income and education affected the use of pharmacists ($p = .004$) (see Table 2).

Table 2. Relationships between demographic variables and health information source

Sources	Age (*p*-value)	Sex (*p*-value)	Education Level Attained (*p*-value)	Household Income (*p*-value)	Higher-Order Effects (*p*-value)
Doctors	.007	.520	.423	.645	.005 - age x education
Pharmacists	.002	.000	.037	.011	.004 - age x income x education
Internet websites	.000	.000	.000	.000	.026 - age x sex
Brochures /pamphlets	.000	.000	.000	.063	
Television	.000	.000	.005	.104	
Nurses	.113	.051	.000	.077	.031 - age x sex
Magazines	.000	.000	.015	.008	
Relatives /friends	.077	.019	.037	.037	
Newspapers	.344	.017	.000	.000	.031 - income x education .049 - sex x education .044 - sex x income
Radio	.005	.013	.003	.000	.035 - sex x education

3.2 Perceived reliability of health information sources

Pearson's chi-square tests showed significant differences in the level of perceived reliability across sources ($p < .001$). Significantly more respondents felt that health information obtained from doctors was reliable, compared to pharmacists [$\chi^2(1, N = 3950) = 134.12, p = .000$] or nurses [$\chi^2(1, N = 3950) = 1223.76, p = .000$]; and pharmacists were perceived as providing more reliable health information than nurses [$\chi^2(1, N = 3950) = 580.09, p = .000$]. When looking at the difference in trust between doctors and pharmacists Cohen's w was 0.140, indicating a small effect size. Conversely, the value calculated for doctors and nurses (0.484), and pharmacists and nurses (0.369) indicated a medium effect size.

Hierarchical log-linear analysis showed that some demographic variables had a statistically significant impact on perceived reliability of health information source (see Table 3). The age of respondents was seen to affect the perceived reliability of health information obtained from pharmacists ($p = .021$), websites ($p = .000$), television ($p = .032$) and magazines ($p = .025$). While respondents' sex affected perceived reliability of pharmacists ($p = .000$) and level of education attained by the respondents affected the perceived reliability of nurses ($p = .006$), pharmacists ($p = .000$), websites ($p = .000$) and newspapers ($p = .000$). Finally, household income was associated with perceived reliability of websites ($p = .000$), newspapers ($p = .001$) and radio ($p = .000$).

The results indicated that the perceived reliability of some health information sources was impacted by the combined effect of two or more demographic variables. Again, a number of these findings were highly significant ($p < .01$); the

perception of pharmacists as a reliable source of information was determined by sex, age and education ($p = .001$) and the reliability of health information in magazines was impacted by both age and education ($p = .009$).

Table 3. Relationships between demographic variables and perceived reliability of health information source

Reliability	Age (*p*-value)	Sex (*p*-value)	Education Level Attained (*p*-value)	Household Income (*p*-value)	Higher-Order Effects (*p*-value)
Doctors	.498	.287	.664	.708	
Pharmacists	.021	.000	.000	.608	.001 - sex x age x education
Internet websites	.000	.096	.000	.000	.043 - age x income
Brochures /pamphlets	.000	.000	.000	.038	.025 - sex x education
Television	.032	.601	.933	.293	.046 - age x education
Nurses	.075	.980	.006	.188	.038 - sex x age x education
Magazines	.025	.750	.438	.155	.009 - age x education .018 - age x education x income
Relatives /friends	.697	.548	.546	.199	
Newspapers	.379	.781	.000	.001	.011 - age x education
Radio	.392	.868	.120	.000	.051 - age x sex .024 - age x education x income .023 - age x sex x income

Leximancer was used to produce a thematic map exploring the responses given to the open-ended question. The theme size was set at 20% and the visible concepts was set at 0%. The concepts are clustered into theme circles, which are named after the most prominent concept. Concepts that co-occur map closely indicating that they are related in some way. Larger shapes represent the concepts that occurred most frequently in the responses. The most common connection between concepts is shown by the grey pathway. The Leximancer insight dashboard was used to explore the reasons behind these concepts. Figure 1 shows that 'training' and 'qualified' grouped closely with 'GP' and 'trust'. Many of the responses referred positively to the training or education received by health care professionals.

> *"They are reliable because of the amount of study they do."*

> *"They are reliable due to their level of education and ongoing updates in their care of patients/customers."*

> *"This is what they were trained for."*

3.3 Healthcare professionals

Exploration of the concepts related to health care professionals (doctors, nurses and pharmacists) again reflect the importance of the health care practitioner's training and education.

> *"GP/doctors and pharmacists are well qualified and offer unbiased information."*

> *"I expect the doctors, pharmacist would be updating their knowledge, often, so as to be able to help patients with new and modern (current) information on cures or medications to assist their patients wellbeing."*

> *"If you can't trust your doctor who can you trust?"*

While there was some acknowledgement of nurses' training and experience in health care, many comments referred to respondents' social exposure to nurses, often through family relationships.

> *"Doctors, pharmacist and nurses have experience and health is their vocation. Therefore usually very reliable advice is given."*

> *"My daughter is a nurse of 30 years experience (at) XXXX Hospital."*

> *"My wife is a nurse and explains things simply to me."*
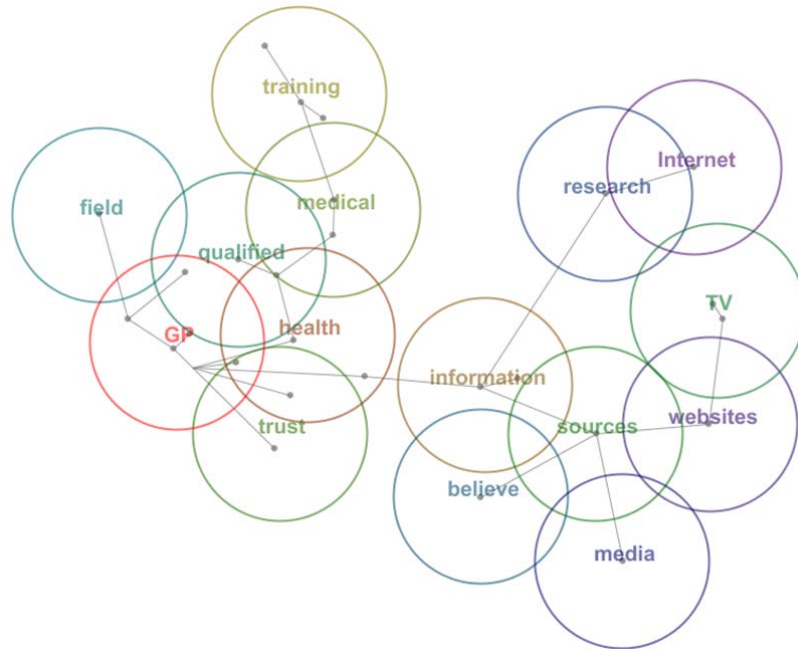
Figure 1. Leximancer map showing themes and concepts associated with perceived reliability of health information sources

4 Discussion

4.1 Health information sources

Doctors (96%) and pharmacists (60%) were the two most frequently cited sources of health information, suggesting that older adults in Australia prefer to receive their health information face-to-face from their health care practitioners. However, just 18% of respondents reported using nurses to obtain health information, making nurses the sixth most likely source of health information. It is not clear why older Australians do not more readily use nurses as a source of health information. It is notable that many older adults perceive nurses as providing reliable health information, but had not received health information from a nurse (18.7% - Table 1). This figure was higher than the number of respondents who perceived nurses as a reliable source of health information and reported having received health information from a nurse (15.4% - Table 1). This suggests that Australian nurses have potential to provide greater amounts of health information to older adults in the future. This discrepancy between use of nurses for health information and the perceived reliability of health information gained from nurses may be unique to Australia as traditionally nurses in Australia have been hospital based. This differs from their role in both the UK and US where nurses have played an integral role in primary health care for many years [21, 22]. In the past, only people admitted to hospital in Australia would have had much contact with nurses.

However, the gradual introduction of Practice Nurses into primary health is likely to increase the numbers of people having contact with nurses, increasing their use as providers of health information. Further research is needed to explain why nurses are not currently used as a source of health information by older adults in Australia and whether this perceived lack of utility is related to the perceived knowledge and training of nurses or to older adults exposure to nurses, in both medical and social settings.

The Internet was the third most commonly used source of health information amongst our sample (24%). The use of the Internet as a health information source was inversely related to age with 40.4% of 55-60 year olds using this channel compared to just 0.3% of respondents aged over 75 years; this is consistent with other work [23-25]. These rates suggest that there is scope for the provision of health information via the Internet for the young olds. Further, it has been postulated that the Baby Boomers, those born between 1943 and 1960 (currently aged 53 – 70 years) [26], will be the first generation to reach older age that have acquired computer skills in the workplace, and that these information technology skills will be retained as they age [27, 28]. Over time, this skill retainment will shift the demographic profile of Internet users, creating an older e-generation that have the computer skills, equipment and desire to search, find and utilise online health information. Therefore, it is likely that in future online health information will have a much wider reach amongst older adults, than it currently does. Pamphlets/brochures were the print media most frequently used to find health information (23%) while television was the broadcast media source most frequently used (20%); ranking fourth and fifth overall.

4.2 Perceived reliability

Doctors and pharmacists were perceived as providing the most reliable health information, which is consistent with previous studies [15, 29]. This perceived reliability was attributed to their 'knowledge' and 'training'. An Australian study conducted in 1989 also found doctors (93%) and pharmacists (72%) to be perceived as the most reliable health information sources with traditional media sources (newspapers 13%, and magazines 14%) rated amongst the least reliable [8]. These rates are comparable to our findings, despite the prior study being over 20 years old – before the advent of the Internet - and having a sample frame of adults aged over 17 years.

Nurses were perceived as the third most reliable source of health information (34%), which is considerably less than the 54% reported in the 1989 study [8]. Further research is needed to understand why these rates are so low. In order for nurses to be effective in the collaborative management of chronic disease in Australia it is necessary that they are seen as providing reliable health information. A recent study found that older adults' reluctance to have GP registrars manage their chronic conditions could be countered by maintaining a relational link with their regular GP [30]. Models such as this should be investigated to see whether they can be extended to Practice Nurses, allowing nurses to contribute optimally to the primary health care team whilst also helping to alleviate pressure on GPs.

The perceived reliability of health information found on the Internet also decreased with age. Again, this is consistent with findings from other research [23, 31]. It is known that Internet health information that is usable and reliable empowers patients to participate in their health care [14]. Therefore, the promotion of credible websites, to both health care practitioners and patients, would be a worthwhile endeavour. While there has been a steady growth in the number of Australian healthcare practitioners recommending websites to patients [32] it is not known whether this addresses the concerns of older adults with respect to the reliability of health information from the Internet. Further research into the factors that affect older adults' trust of information on the Internet is recommended.

The results from this large, paper-based survey have provided information on the sources of health information used by older Australians and the perceived reliability of this information. However, the results are limited by the use of dichotomous variables, which provided no information on source ranking. We did not collect information on the frequency of use of each source of health information, nor did we investigate whether the health information obtained impacted behaviour. While our questions asked about nurses, we did not specify nurse role (e.g. hospital nurse versus primary health care nurse). Future studies should investigate whether nursing role impacts the use of nurses as a source of health

information and whether respondents' exposure to nurses, both through healthcare settings and socially, influences the perceived reliability of the information provided. Finally, our survey had a low number of respondents who spoke a language other than English at home (6%) as compared to rates for New South Wales (26%) [33], which may be attributed to the use of a survey tool written in English.

5 Conclusions

While doctors and pharmacists were reported as the most frequently used and most reliable sources of health information, the impact of the current ageing population means that there is a need to utilise other sources. Nurses are ideally placed to provide collaborative management of chronic diseases. While the results suggest that there is significant scope to increase their role as providers of health information, practice models need to be investigated to effectively utilise this potential.

The importance of the Internet as a source of health information for older adults will continue to increase as the population ages and older adults have greater information technology skills. It is likely that the use of the Internet for health information can be aided by the promotion of credible websites by healthcare professionals. The combined use of nurses and the Internet to provide health information, particularly self-management education, would help alleviate the current pressures on GPs.

Acknowledgements

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