

Developing policies for e-health: use of online health information by Australian health professionals and their patients

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Abstract

An online survey (www.limesurvey.org) was used to identify patterns of usage of health information available on the Internet by five major Australian health professions (AHPs): general practice, social work, dietetics, physiotherapy and optometry. Survey questions were developed to explore participants' responses associated with their level of Internet usage. From the five AHPs ($n=746$), it was found that social workers and dietitians most frequently recommended health websites to their patients (11–20% of the time throughout a 12-month period [2009]). Health information topics most frequently recommended and brought to health professionals' attention by patients were concerned with 'specific health conditions' and the main source professionals used to access health information was identified through the use of 'search engines'. This study further reports that Internet recommendations from health professionals¹ (1–10%), Internet requests from patients² (<1%) and Internet consultation processes³ (1%), do not mirror similar international research. It is recommended that development of policies that might influence e-health should not be based on a presumption that the use of the Internet for accessing health information is universal or that the Internet strongly influences Australian healthcare delivery.

Key words (MeSH): *Internet; Telemedicine; Health Care; Health Policy; Health Information; Decision Making*

Introduction

Disease and healthcare delivery in the early 21st century

Chronic diseases currently contribute to around 70% of the total burden of illness and injury experienced by the Australian population, with the expected proportion to increase to 80% by 2020 (Department of Health and Ageing 2008). Seven identified health areas contribute significantly to the burden of illness and injury in Australia, identified as National Health Priority Areas: 1) arthritis, 2) musculoskeletal conditions, 3) asthma, 4) cardiovascular health, 5) diabetes mellitus, 6) injury and 7) mental health. With a chronic disease epidemic emerging throughout the Australian population, Yee, Miils and Airey (2008) argued that current healthcare delivery, management and education models pertaining to chronic disease and addressing health inequalities will not meet future demands, and that productivity and efficiency of future healthcare and education will be sustainable only if organisations leverage advances in technology (i.e. the Internet). To address such concerns, future initiatives all rely on the successful integration of multiple perspectives, capacity to transcend traditional boundaries surrounding past management and education styles and ability to think in innovative ways (Yee, Miils & Airey 2008).

Australian health professionals and Internet usage

The Internet and World Wide Web have become major information sources for health professionals (Fox, Rainie & Horrigan, 2000; Pandey, John & Tiwary 2003; Uden-Kraan 2009). A review of the literature identified that dietitians are using the Internet routinely in their work (Kirk, Cade & Greenhalgh 2002; Case 2005), general practitioners (GPs) are highly connected to the Internet (Masters 2008), social workers use the Internet to provide support when regular services are not available (Banach, Frances & Berna 2005), physiotherapists predominately use the Internet for educational purposes (Drennan & McColl-Kennedy 2003; Perreault 2008) and practising optometrists interact with colleagues using Internet discussion groups or bulletin boards (Herse & Sayer 2009). Such developments indicate that health professionals are becoming less resistant to using the Internet for healthcare delivery (Forkner-Dunn 2005; Shephard et al. 2008). However, there is limited rigorous cross-sectional research investigating and comparing AHPs and their members' Internet usage for delivering healthcare in the early 21st century. Moreover, research indicating reasons behind contrasting patterns of Internet recommendations from health professionals, Internet requests from patients, consultations and the use of the Internet as a source for professional development by individual AHPs is narrow.

1 Internet recommendation from health professionals – a health professional will recommend a health website to a patient.

2 Internet request from patients – a patient will request that the health professional recommends a health website to them.

3 Internet consultation – a patient brings health information found from the Internet for consultation with health professional.

The aim of this paper was to identify patterns of Internet use by five of the major Australian health professions (AHPs) to deliver healthcare in the early 21st century.

Method

Participants

Recruitment of participants was via an unbiased email alert that was sent by an official representative from each professional health society. Other avenues to promote the survey were via the health societies' official websites, twitter alerts, newsletters and e-newsletters. Initially, 887 responses were collected. However, only 746 responses were included for analysis and 141 responses were excluded due to limited detail associated with demographics or because participants did not complete the main parts of the survey.

Survey design

An online survey was used to collect data. The survey was developed using the LimeSurvey online tool (www.limesurvey.org) supported by the Griffith University Survey Research Centre (Gold Coast campus, Australia). The survey was designed and used to collect empirical data and was hosted on the Griffith University website. Ethics approval for the research was obtained through the Griffith University Office of Ethics. Surveys were developed from a common set of questions with specific variations between professions negotiated with all professional health societies identified. Survey questions were developed to explore participants' responses associated with their level of Internet usage for: 1) recommending a health website to their patients, 2) providing a health website from patients' requests, 3) addressing health website information brought from patients for consultation, 4) as a source of professional development and 5) the top three health websites recommended to patients. Surveys also allowed participants the ability to identify any other reason/s (qualitatively) for their website recommendation trends and user patterns which were not identified in the survey. However, there were no new forthcoming data additional to the surveys' initial question sets.

Data analysis

Initial data preparation involved the development of one integrated file using the Statistical Package for the Social Science (SPSS) to incorporate all responses from the five surveys undertaken – this meant that in some cases there were no responses to specific items from some surveyed groups due to the variable design of the questionnaire. Initial data analysis applied Frequencies and Crosstabs to the identified groups and provided a profile of respondents by key business and demographic characteristics. To determine demographic characteristics, the initial analysis used a Varimax rotation, Principals components extraction method. The mean (*M*) was calculated using SPSS

to allow comparison across items and groups. An ANOVA and Tukey HSD tests were conducted to explore significance between health professional societies. Further data collection and analysis methods employed a 7-point scale (1=0%, 2=<1%, 3=1-10%, 4=11-20%, 5=21-30%, 6=31-40%, 7=>40%) with the percentage indicating the frequency of health information topics used/viewed for professional development during the last 12 months (2009).

The survey elicited responses regarding the top three health websites recommended by participants. To determine the most commonly recommended sites, a weighting procedure was used to account for frequency (identified as the top three websites recommended). The first site was weighted 3, second most common 2 and third a weighting of 1; thus up to 6 points could be allocated by each respondent. Reporting of most popular sites are indicated by health website, number sampled and score within each health group (e.g. beyondblue, first 6 x 3=18, second 8 x 2=16, third 10 x 1=10, Total=44). In addition to providing a 'within group' identification of most common site, it also allowed some across group comparisons. By standardising the score for each site we were able to see if there were top websites represented; that is, a few strongly recommended sites or the top recommendations.

Results

Demographics of participants

Table 1 summarises the demographics of the participants from the five different AHPs and indicates the number of surveys collected from each occupation. The overall gender distribution of the sample showed a greater representation of females. This varied markedly by occupation, with 62% of responding GPs being male, while responses from social workers ($n=97$, 89%) and dietitians ($n=115$, 85.8%) were mainly female. Age distribution also showed a reasonable range, with most GPs, physiotherapists, and optometrists being between 30 and 50 years of age. In most cases, participants had significant professional experience (65.3% over 10 years), except dietitians, the majority of whom (66.4%) had fewer than 10 years' experience.

With regard to type of practice, GPs, physiotherapists and optometrists were mainly based in private practice while social workers and dietitians mainly worked for government departments. Marked differences were noted in size of practices, with, for example, only 26.6% of optometrists having a practice of ≤ 1000 clients, while 98.2% of social workers had a practice in this size range. Approximately half of the participants identified their location as a major city (59.8%) with over 10% of GPs identifying their location as remote. The sample was spread across Australia, with more than 70% of the participants from Queensland (26.81%), New South Wales (24.3%), and Victoria (22.5%).

Table 1: The sample population showing key demographic features

AUSTRALIAN HEALTH PROFESSIONALS	NO. OF AHP	GENDER		AGE (YEARS)			YEARS OF EXPERIENCE		PRACTICE TYPE			NO. OF PATIENTS IN LAST 12 MTHS		
		FEMALE	MALE	<30	30-50	>50	<10	>10	PRIVATE	GOVT	OTHER	≤1000	>1000	
GPs	104	40	64	15	55	34	29	75	86	16	2	35	69	
Social Workers	109	97	12	10	43	56	37	72	18	68	23	107	2	
Dietitians	134	115	19	70	49	15	89	45	47	77	10	114	20	
Physiotherapists	271	188	83	52	147	72	70	201	158	72	41	129	142	
Optometrists	128	64	64	26	67	35	34	94	124	0	4	34	94	
Total	N 746	504	242	173	361	212	259	487	433	233	80	419	327	
	%	100	67.6	32.4	23.2	48.4	28.4	34.7	65.3	58.0	31.2	10.7	56.2	43.8

	CITY	LOCATION			STATE/TERRITORY								
		REGIONAL	REGIONAL	REMOTE	QLD	NSW	SA	WA	NT	VIC	TAS	ACT	
GPs	69	11	12	12	47	22	9	6	1	17	1	1	
Social Workers	63	24	21	1	29	28	12	11	0	19	6	4	
Dietitians	84	26	16	8	37	27	15	11	4	35	2	3	
Physiotherapists	154	42	61	14	51	67	27	35	3	68	10	10	
Optometrists	76	24	24	4	30	37	9	17	1	29	4	1	
Total	N 446	127	134	39	194	181	72	80	9	168	23	19	
	%	59.8	17.0	18.0	5.2	26.0	24.3	9.7	10.7	1.2	22.5	3.1	2.5

Table 2: Most frequently* recommended health websites by Australian Health Professionals

AUSTRALIAN HEALTH PROFESSIONALS	TOP 1	TOP 2	TOP 3
GPs	HealthInsite www.healthinsite.gov.au	Beyond Blue www.beyondblue.org.au	Diabetes Australia www.diabetesaustralia.com.au
Social workers	Beyond Blue www.beyondblue.org.au	Better Health Channel www.betterhealth.vic.gov.au	Cancer Council NSW www.cancercouncil.com.au/
Physiotherapists	Arthritis Australia www.arthritisaustralia.com.au	Australian Physio Assoc. www.physiotherapy.asn.au	Better Health Channel www.betterhealth.vic.gov.au/
Dietitians	Diabetes Australia www.diabetesaustralia.com.au	Better Health Channel www.betterhealth.vic.gov.au/	Heart Foundation www.heartfoundation.gov.au
Optometrists	Macular Degeneration Foundation www.mdfoundation.com.au	Keratoconus Australia www.keratoconus.asn.au	Laser Sight Centre www.lasik.com.au

*When interpreting the frequency of top three health websites, consideration should be given to the type of health profession.

Table 3: Recommendation and gender prevalence

AUSTRALIAN HEALTH PROFESSIONALS	% of patients that recommended a health website	Age group which was most often recommended a health website by participants	% of female patients who were recommended a health website	% of male patients who were recommended a health website	% of patients who requested a health website	Age group which most often requested a health website
GPs	1-10%	26-30	1-10%	1-10%	<1%	31-35
Social Workers	11-20%	26-30	11-20%	1-10%	<1%	31-35
Dietitians	11-20%	41-45	1-10%	1-10%	<1%	31-35
Physiotherapists	1-10%	31-35	1-10%	1-10%	<1%	31-35
Optometrists	<1%	21-25	<1%	<1%	0%	0%

Note: Reference should be given to each AHP's number of patients in a 12-month period.

Table 4a: The top three information topics viewed/used by AHPs for their own professional development (from the internet)

AUSTRALIAN HEALTH PROFESSIONALS	TOP 1	TOP 2	TOP 3
GPs	Specific health conditions (M = 6.00)	Drug therapy for specific health conditions (M = 4.68)	Pharmaceutical products and services (M = 3.63)
Social workers	Specific health conditions (M = 5.37)	Other services beneficial to clients (M = 4.16)	Human behaviour (M = 3.81)
Dietitians	Specific health conditions (M = 6.18)	Promoting healthy lifestyle changes (M = 3.79)	Pharmaceutical products and services (M = 3.51)
Physiotherapists	Specific health conditions (M = 5.54)	Medical therapies for specific health conditions (M = 4.33)	Surgical procedures (M = 4.10)
Optometrists	Education about specific ocular diseases and conditions (M = 5.07)	Drug therapy for specific ocular diseases and conditions (M = 3.57)	Pharmaceutical products, services and equipment (M = 3.09)

Notes: M = mean; higher mean indicates higher percentage of the information topics viewed/used by participants during the last 12 months.

Type of most frequently recommended health websites

This study gave specific attention to uncovering and presenting some of the more frequently used and recommended health websites by AHPs. Table 2 displays the most frequently recommended health websites by way of type and associated AHP.

Health website recommendation trends and gender prevalence

Table 3 indicates that social workers ($M=3.57, SD=1.58$) and dietitians ($M=3.52, SD=1.46$) were the groups who most frequently recommended a health website to patients during the last 12 months (2009). A 7-point scale (1=0%, 2=< 1%, 3=1-10%, 4=11-20%, 5=21-30%, 6=31-40%, 7= over 40%) was used, with the percentage indicating frequency of health website recommendation. A between-groups ANOVA was conducted to explore the impact of participants' health group membership on the percentage of patients who were recommended to a health website (during the last 12 months [2009]). There were significant differences in percentages for the 5 groups, $F(4, 364)=15.58, p<.01$. Post hoc comparisons using Tukey HSD test indicated that the mean score for optometrists ($M=2.29, SD=.73$) was significantly different from the score for GPs ($M=3.47, SD=1.49$), social workers ($M=3.57, SD=1.58$) and dietitians ($M=3.52, SD=1.46$), but was not significantly different from the mean score for physiotherapists ($M=2.91, SD=1.26$). Physiotherapists differed significantly from social workers and dietitians.

Table 3 further indicates that age group of patients most frequently recommended to a health website by participants varied across the five health professions. While dietitians most frequently recommended websites to older adults (41–45 years), other professions recom-

mended to younger adults (21–35 years). Overall, the percentages of recommendations to both female and male clients were similar across different health professions, mostly in the frequency of 1–10% during the last 12 months (2009). Table 3 also shows that the percentage of patients who requested a health website recommendation from AHPs was small (<1%), and particularly low for optometrists (0%). A between-groups ANOVA was conducted to explore the effect of participants' health group membership on the percentage of patients who requested a website recommendation during the last 12 months (2009). There were significant differences in percentages for the 5 groups, $F(4, 741)=12.30, p<.01$. Post hoc comparisons using Tukey HSD test indicated that the mean score for optometrists ($M=1.47, SD=.69$) and physiotherapists ($M=1.77, SD=.98$) was significantly different from the mean score for GPs ($M=2.29, SD=1.42$) and dietitians ($M=2.34, SD=1.59$), while the mean score for social workers ($M=1.8, SD=1.33$) was significantly different only from the score for dietitians ($M=2.34, SD=1.59$). In addition, the age group that most often requested a health website (middle-aged adults; 31–35 years) was the same across the four professions whose patients requested a health website recommendation.

Professional and patient information outcomes

Table 4a summarises the top three health information topics that participants viewed from health websites for their own professional development. The outcome varied markedly by occupation. This was measured using a 7-point scale (1=0%, 2=<1%, 3=1-10%, 4=11-20%, 5=21-30%, 6=31-40%, 7=>40%) with the percentage indicating frequency of health information topics used/ viewed for professional development during the last 12 months. Table 4b indicates the sources participants used

Table 4b: The top three sources used to access health information for own professional development or recommendation practices (from the internet)

AUSTRALIAN HEALTH PROFESSIONALS	OWN PROFESSIONAL DEVELOPMENT			RECOMMENDATION PRACTICES		
	TOP 1	TOP 2	TOP 3	TOP 1	TOP 2	TOP 3
GPs	Search engines ^ (M = 5.39)	Medical literature and journals (M = 4.07)	RACGP website (M = 3.34)	Search engines (M = 4.76)	Medical/healthcare literature & journals (M = 3.18)	Medical newsletters/ faxes (M = 2.92)
Social workers	Search engines (M = 5.75)	Medical literature and journals (M = 3.75)	Professional peers (M = 3.46)	Search engines (M = 4.44)	Professional peers (M = 3.68)	Medical literature and journals (M = 2.24)
Dietitians	Search engines (M = 5.44)	Nutrition and health literature & journals (M = 4.45)	DAA website (M = 4.27)	Professional peers (M = 3.82)	Search engines (M = 3.56)	DAA website (M = 3.40)
Physiotherapists	Search engines (M = 5.57)	Medical/healthcare literature & journals (M = 4.75)	APA website (M = 3.20)	Search engines (M = 4.13)	Medical/healthcare literature & journals (M = 3.16)	Professional peers (M = 2.45)
Optometrists	Search engines (M = 5.58)	Medical literature and journals (M = 3.40)	OAA newsletters/ faxes (M = 3.07)	Search engines (M = 3.17)	Professional peers (M = 2.57)	OAA website (M = 2.48)

Notes: M = mean; higher mean indicates higher percentage of the sources used by participants for own professional development or recommendation practice during the last 12 months.
^ Search engines – Google, Altavista, Yahoo etc.

to access health information for their own professional development as well as their health website recommendation practices. Participants were asked to indicate the percentage of frequency health information sources that they viewed/used for their own professional development and used to recommend to patients during the last 12 months (2009). Table 4b shows the top three sources used for these two purposes.

Types of health information recommended to and brought by clients

Participants indicated the percentage of health websites that they recommended to patients that related to certain health issues, and what percentage of information that patients brought from the Internet related to certain health issues. Descriptive analysis showed the three most frequently recommended health topics and the three health topics that were most often brought for consultation by patients. Health topics were found to be different across the five health professions (Table 5).

Participants were asked: ‘During the last 12 months (2009) what percentage of your patients brought you health information (for consultation) that they have found from the Internet about their health condition or

disease?’ On average, all health professions indicated that less than 1% of their patients brought health information for consultation (Table 6). An ANOVA was conducted to explore the impact of health group membership on the percentage of patients who brought health information for consultation. A significant difference was found in the percentage for the five groups, $F(4, 741) = 9.11, p < .01$. Post hoc comparisons using Tukey HSD test indicated that the mean score for optometrists ($M=1.66, SD = .80$) and social workers ($M=1.73, SD=1.18$) was significantly different from GPs ($M=2.24, SD=1.33$), dietitians ($M=2.27, SD=1.45$), and physiotherapists ($M=2.29, SD=1.27$).

Table 6 identifies that the patients who most often brought participants health information (they found from the Internet) for consultation were from the age group 31–35 years; except GPs (36–40) and dietitians (46–50 years), who indicated that older age groups most frequently brought health information from the Internet. On average, the percentage of female and male patients who brought health information for consultation was similar across the five groups of health professions (< 1%).

Table 5: The top three health topics recommended to patients or brought from patients for consultation (from the internet)

AUSTRALIAN HEALTH PROFESSIONALS	HEALTH TOPICS MOST FREQUENTLY RECOMMENDED TO PATIENTS			HEALTH TOPICS BROUGHT FROM PATIENTS FOR CONSULTATION		
	TOP 1	TOP 2	TOP 3	TOP 1	TOP 2	TOP 3
GPs	Specific diseases (M = 5.78)	Prevention of disease with lifestyle changes (M = 4.20)	Pharmaceutical drug treatments (M = 2.98)	Specific diseases (M = 5.10)	Medicine and treatments (M = 3.77)	Pharmaceutical drug treatments (M = 3.69)
Social workers	Specific diseases (M = 3.89)	Prevention of disease with lifestyle changes (M = 3.50)	Addressing issues associated with ‘social determinants’ of health (M = 2.53)	Specific diseases (M = 2.68)	Prevention of disease with lifestyle changes (M = 2.37)	Pharmaceutical drug treatments (M = 2.21)
Dietitians	Education about specific diseases (M = 4.74)	Weight loss with dietary modification (M = 3.76)	Prevention of disease with dietary modification (M = 3.68)	Education about specific diseases (M = 3.68)	Weight loss with dietary modification (M = 3.37)	Alternative medicine and treatments (M = 3.23)
Physiotherapists	Specific diseases (M = 4.83)	Prevention of disease with lifestyle changes (M = 3.76)	Exercise prescription (M = 2.88)	Specific diseases (M = 3.62)	Surgical treatments (M = 2.26)	Exercise prescription (M = 2.08)
Optometrists	Specific ocular diseases and conditions (M = 4.78)	Specific to either elderly, children of partially sighted (M = 3.94)	Surgical treatments for ocular diseases and conditions (M = 3.56)	Specific ocular diseases and conditions (M = 2.57)	Surgical treatments for ocular diseases and conditions (M = 2.32)	Ocular applications – contact lens, spectacles (M = 1.82)

Notes: M = mean; higher mean indicates higher percentage of the sources used by participants for own professional development or recommendation practice during the last 12 months.

^ Search engines – Google, Altavista, Yahoo etc.

Table 6. Percentage of patients’ health information, age and gender who brought information to participants for consultation (from the internet)

AUSTRALIAN HEALTH PROFESSIONALS	Percentage of patients who brought health information for consultation	Age group which most often brought health information	Percentage of female patients who brought health information	Percentage of male patients who brought health information
GPs	<1%	36-40	<1%	<1%
Social workers	<1%	31-35	<1%	0%
Dietitians	<1%	46-50	<1%	<1%
Physiotherapists	<1%	31-35	<1%	<1%
Optometrists	<1%	31-35	<1%	<1%

Note: Reference should be given to each AHP’s number of patients in a 12 month period - 2009.

Discussion

Results showed that key differences between the surveyed groups were apparent, with such differences appearing consistent with observed patterns within the broader community. Trends identified in this study, in terms of patterns of Internet health information recommendations, requests, consultations and as a source of professional development, may be seen to be directly influenced by Government designed, advertised and supported health websites. These websites are becoming a more frequent and acceptable form of information exchange and health care delivery across all sectors of the health care landscape (Nielsen's Internet & Technology Report 2010). This is particularly evident, with the majority of the top three recommended health websites for each profession being a Government website. Of particular interest are the health websites 'Better Health Channel' (<http://www.betterhealthvic.gov.au/>), 'beyondblue' (www.beyondblue.org.au) and Diabetes Australia (www.diabetesaustralia.com.au), which have been identified as leading Internet recommendation sites across a number of different health professions. Interestingly, this study has identified that the main recommended health websites correspond with a number of the seven National Health Priority Areas.

Closer inspection of the top three most frequently viewed health websites revealed that they maintain and display many of the components that increase a health website's reliability levels (authority, accuracy, objectivity, currency, intended audience, coverage, confidentiality and justifiability). Increased levels of reliability may be a major factor in, and motivation for, current and future AHPs' Internet recommendation trends and patterns of online health information usage (Usher 2009). Conversely, research indicates that the fact that some health professionals do not interact with the Internet is largely due to the unreliable nature of medical information on the Internet (Illingworth 2002), the lost human touch (Sheppard & Mackintosh 2008) and also the perception of the informed patient as the problem patient (Ahern, Kreslake & Phalen 2006; Castaldo 2008).

Of particular interest are patterns of online health information recommendations, requests, consultations processes and professional development sources that have been identified from this study. With much of the current international literature suggesting an exponential amount of health information exchange between health professionals and consumers (McMullan 2006; Castaldo 2008; Seeman 2008; Yee, Miils & Airey 2008; Uden-Kraan 2009), this research found little to suggest or support such trends from the AHPs in this study. Although many people use the Internet to access health information (Usher 2007; Weinert, Cudney & Hill 2009; Usher 2009), this study found that recommendations (1–10%), requests (<1%) and consultation processes (1%) associated with Internet health information between AHPs and their patients did not mirror results of international research. Consideration as to the development of policies that might influence e-health should not presume that use of

the Internet for health information is universal or that the Internet strongly influences healthcare delivery.

Other data from this study have identified that health information topics most frequently viewed and recommended by health professionals, and most frequently brought to health professionals by their patients, were concerned with 'specific health conditions' and that the main source professionals used to access health information for their professional development and recommendations came from 'search engines' (Google, Altavista, Yahoo). Such usage patterns surrounding 'search engines' brings into question the reliability of the health websites that health professionals are using and recommending to their patients. Usher (2009) concluded that Gold Coast (Australia) GPs demonstrate a range of understanding and critical appraisal skills used to determine a health website's level of reliability (authority, accuracy, objectivity, currency, intended audience, coverage, confidentiality and justifiability), with many reporting a moderate understanding of these components. Increasing AHPs' understanding pertaining to a health website's reliability components may be a major factor in encouraging future Internet usage by AHPs. Uden-Kraan (2009) maintained that the Internet will be widely adopted as a part of usual care only if this venue improves reliable patient self-management, better patient satisfaction, and enhances health outcomes.

Other important considerations necessary for interpreting Internet usage trends is the identified participant ratio as to who works either through a private (58%) or government (31.2%) practice, whereby it would be assumed that AHPs may engage in using the Internet for private practice promotion, advertising and marketing. It was also indicated that participants who were more inclined to use the Internet were from major cities (59.8%) and had patient numbers, in a 12-month period, of <1,000 (56.2%). Given these findings, it is a recommendation that further research be undertaken that would investigate ways in which AHPs use the Internet and other communication technologies (i.e. social media and mobile devices) that would heighten practice promotion and healthcare delivery throughout government practices and remote areas of Australia. Supporting such a recommendation is the notion that online knowledge and information empowers patients, providing greater control in coping and managing their illness (Barak, Boniel-Nissim & Suler 2008; Lindsay et al. 2009; Weinert, Cudney & Hill 2008) and has advantages associated with eliminating barriers associated with geographical distance (Barak, Boniel-Nissim & Suler 2008; Shepherd et al. 2008; Weinert, Cudney & Hill 2008), a major issue for Australia's regional, rural and remote communities. Communication technologies provide a promising alternative method of healthcare for patients and follow-ups where access to services and face-to-face consultation support is unavailable (Saqui et al. 2007; Shepherd et al. 2008).

A further recommendation from this study should be to provide avenues (Continuing Professional Development) for AHPs that will develop critical appraisal skills associated with the evaluation, use, retrieval and recommendation of online health information. This is, perhaps, an initial step in improving the acceptance and adoption of e-health technologies in a broader context. Furthermore, this study recommends that health societies (as those identified in this study) provide professional educational modules that would inform AHPs about current Internet recommendation trends and reliable health websites in their chosen profession. Furthermore, courses added to health schools' curriculums on how best to assess, use and recommend health websites for patient education have frequently been indicated as a necessity for future AHP training. To date, there is little research indicating any substantial coordinated approach to addressing these recommendations (Australian Institute for Primary Care 2008).

Limitations to study

The study had some limitations associated with the survey instrument, the major limitation being the initial online data collection method (LimeSurvey). Although this program allowed for collection of full completions it did not recognise the extent of partial completions; that is, whether participants who partially completed the survey finalised the survey at a later time or if they disbanded the survey. As this could not be established, no partial completions were recognised in participation rates. Notification of patterns enabling subsequent follow up would have increased participation rates.

The length of questions in the research instruments created a second limitation for the study and may have been a reason for the number of partial completions. As such, the questionnaire would need considerable shortening for future surveys. A third limitation was the inability to differentiate between genders, which resulted in a higher participation rate from Australian female AHPs. However, given the nature of some of the health professionals in this study (i.e. dietitians and social workers), a higher female participation rate was expected. This limitation was also associated with identifying and capturing relatively equal sample sizes associated with all variables (age, years of experience, location, practice type and client numbers). Future participant recruitment avenues need to be established that have a reach to non Internet users.

Identified participation rates were only achieved via the societies' email service. Due to regulations and privacy restrictions, only one email was sent by individual societies to their members. This limited level of survey notification would have significantly affected participation rates. A recommendation would be to include a more effective avenue for the advertising of the survey, thus increasing participation rates. Future instrument designs may benefit from identifying and developing a data collection strategy that addresses the above limitations.

Concluding thoughts

This research revealed that the AHPs involved in this study demonstrated limited online health information recommendations and referrals, and experienced few requests for a website recommendation. Current literature surrounding the Internet indicates that using the Internet as a source of health information retrieval and recommendations will continue to saturate the healthcare landscape. As AHPs and consumers become more networked, Internet access will become more available, and as online information becomes more reliable, the management and education of disease will change (Ruotsalainen, Iivari & Doupi 2008). Further, the heightened reliability of current health websites is giving health professionals added confidence that what they are recommending is a reliable and safe source of health information for their patients (Lindsay et al. 2007; Lindsay et al. 2008).

It is expected that online health information retrieval will reflect a steady growth throughout all Australian demographics (Yee, Miils & Airey 2008). Statistics indicate that between the years 2005–2006, 60% of Australian households had home internet access and 70% had access to a home computer (ABS 2006). However, there is limited evidential baseline data associated with online health information retrieval and user trends of Australians (ABS 2005). Further research is warranted that will investigate Australian health consumers' Internet usage trends and the impact these trends have on the health professional–consumer nexus. Looking to the future, further research focus on new initiatives underpinned by communication technologies is necessary to provide opportunities for increased healthcare delivery in the early 21st Century. Findings from this study may help guide future research and policy and assist AHPs to develop skills necessary for the delivery of effective modern e-health, practice promotion, health education and public health promotion.

As this is the first Australian study to examine AHPs' patterns of use of online health information, further research and cross-cultural studies should be undertaken to determine avenues for designing and implementing professional educational modules concerning e-health. Similarly, research should be undertaken to identify what mechanisms may encourage both contemporary and future AHPs to adopt modern e-health delivery methods.

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