

Adopting and adapting an Internet intervention to support breastfeeding duration and breastfeeding research throughout regional Western Australia

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Roslyn Giglia graduated as a dietitian from Curtin University in 1991 and took up a clinical position at Hornsby Ku-ring-gai Hospital in Sydney's north to commence her career. She then worked at the Central Coast Area Health Service as a community dietitian and returned to Perth in 1996 where she completed her Masters in Public Health by research. On her return to WA she worked in a variety of public health settings, including at a national policy level as a co-author for the NHMRC National Dietary Guidelines for Older Australians; in regional positions at Kalgoorlie and the Eastern Metropolitan area; and as the Manager of Education and Research for the then Cancer Foundation of Western Australia.

In 2004 Roslyn was successful in being awarded a NHMRC Public Health Postgraduate Scholarship to commence work on her PhD at Curtin University. Her PhD thesis is titled 'Alcohol consumption and cigarette smoking of Australian women; changes with pregnancy and lactation' and is a compilation of seven published articles. In March 2009 the recommendations from her PhD thesis were included in the revised NHMRC; 'Australian Alcohol Guidelines to Reduce Health Risks from Drinking Alcohol'.

Roslyn is currently working part time as a Healthway Health Promotion Research Fellow at Curtin University of Technology. In this research she aims to support breastfeeding women in rural Western Australia through an Internet intervention.

Roslyn is a national director for the Dietitians Association of Australia. She is passionate about breastfeeding and believes there is no other single greater public health measure in Australia that can help infants develop into healthy children and adults.

When Roslyn isn't being a researcher and director she is a wife, mother to Ruby and Remy, surfer, swimmer and water polo player.

Introduction

Access to the internet is becoming reasonably widespread in Australia with approximately 72% of Australian households having access to the internet in 2008–2009, representing a fourfold increase since the previous decade. (Australian Bureau of Statistics 2009) With the Australian government commitment to regional broadband access of \$1.1 billion dollars in 2005 (Australian Government Department of Broadband and Communication and the Digital Economy 2005) and the continued development of the National Broadband Network throughout Australia (Australian Government Department of Broadband and Communication and the Digital Economy 2010) internet access in ex-metropolitan areas (69%) of Australia is approaching that of metropolitan centres (77%). (Australian Bureau of Statistics 2009)

In rural Australia access to health services and health professionals is often limited with the majority of health support being available in the metropolitan centres. (Australian Bureau of Statistics 2005) With more people going online in search of health information, particularly women, (Fox 2005) the internet is potentially filling an information gap in health services in rural areas. As home internet access in inner regional, outer regional and remote areas of Australia approaches 65%, the internet can also help fill the gap of isolation experienced by women living in regional Australia. (Australian Bureau of Statistics 2009)

Breastfeeding is one such women's health issue requiring both medical and social support. The promotion, support and encouragement of breastfeeding is a primary goal of nutrition and public health programs around Australia and internationally (Binns and Davidson 2003; WHO and UNICEF 2003; Australian Government 2008). Breastfeeding has been well documented to benefit both the mother and her infant, in promoting positive nutritional, social, economic and health outcomes (Horta BL, Bahl R et al. 2007). Although breastfeeding initiation rates in Australia are high with over 90% of women breastfeeding at hospital discharge, a large number of these women stop breastfeeding within the first few weeks, with approximately 10% and 20% of women ceasing breastfeeding in the first week and first month post partum, respectively (Scott, Binns et al. 2006).

Difficulty with breastfeeding in the early postpartum period is a significant risk factor for the early cessation of breastfeeding, particularly in the first four weeks. (Scott, Binns et al. 2006) Therefore early support for

breastfeeding mothers is a leading factor in breastfeeding maintenance. Information, reassurance and encouragement can be communicated to regional women experiencing breastfeeding issues via the internet. The aim of this research is to evaluate the usefulness of an internet intervention to support breastfeeding women living in regional Western Australia (WA). This paper will document the development of the website intervention and expansion of the research project into regional WA centres.

Methods

Phase One—formative research

In order to develop an effective and useful website, a formative research survey was undertaken during March to June 2009 to determine the most appropriate content for the internet intervention. A convenience sample of new mothers living in the Midwest region of WA were asked to complete a paper based survey at six weeks postpartum while attending a mother's group meeting facilitated by the local Child Health Nurse (CHN).

Phase Two—website development

Based on the feedback from the formative research a website was developed onsite at Curtin University and securely hosted on the university web server. The website content was developed by the Chief Investigator taking into consideration the formative research results and a comprehensive evidence based search of the literature.

Before going 'live' the website was trialled with the project's Consumer Reference Group. This group was a separate group of mothers with infants aged between newborn to six months of age, who were currently living in regional WA. The Consumer Reference Group was asked to view the website online and provide input on the design and aesthetics of the site, ability to navigate with ease around the site, and the usefulness of the information provided by the website. Group members were provided with a secure login username and password to the development site and provided feedback on the website via email or telephone discussion.

A small starter grant was obtained from Healthway, the Western Australian Health Foundation, which enabled a three month pilot of the website to be conducted from March 2010 onwards in the Midwest region of WA.

Phase Three—study implementation

The Regional Infant Feeding Study (RIFs) is currently being conducted in seven public hospitals and one private hospital in regional WA. Regions of WA involved include the Midwest (one public and one private hospital), the Goldfields (one public hospital) and the Southwest (six public hospitals). Data collection commenced in the Midwest in March 2010 and has subsequently been introduced at various stages in the other seven hospitals. Initially only intended to be conducted in two regional hospitals, an advertisement was hosted on the Dietitians Association of Australia (DAA) website and sent through WACHS distribution lists requesting regional dietitians become involved.

There are three methods of recruitment of women to this research study. The main method of recruitment is by the hospital midwives at the maternity ward level. The second method of recruitment is dependent upon the regional dietitian for the recruitment of the mothers during their postpartum hospital stay. Women are recruited from maternity wards within the first three days following the birth of their infant and those agreeing to participate in the study complete a self-administered baseline questionnaire while in hospital or shortly after discharge. The survey can be returned to the ward staff and/or dietitian for return to the research team, or women can post this independently to the research team in the reply paid envelope provided.

Alternatively women are able to complete the baseline survey online when they return home from hospital. The women complete the consent form while in hospital and are provided with a username and password, and the website URL for when they return home. Upon login at home the women are randomised to either the control or intervention. Women declining to participate are asked to provide some basic socio-demographic data in order to determine the representativeness of the sample.

The third method of recruitment is through the regional Child Health Nurses. All Child Health Nurses conduct a universal home visit to new mothers within the first week post discharge from the hospital. At this point the

Child Health Nurse distributes the baseline survey and mothers complete and return these to the research team in the reply paid envelope provided.

Post completion of the hardcopy of the baseline questionnaire mothers are logged onto the website by the research team and are computer randomised (blinded) to the website intervention group or control group.

Upon being logged onto the website all mothers receive a welcome email alerting them to the control or website URL, depending on which group the mother has been randomised to, and their respective username and password login, which they are then free to reset once they enter the site. The intervention group has access to the study website and control mothers access a website which redirects women to helpful parenting and infant feeding websites which have been assessed for the accuracy of their information. The allocation to control or intervention group is “without prejudice” and all mothers receive normal postpartum maternity services available in the community (e.g. scheduled Child Health Nurse visits). All mothers in the study are followed up by online surveys at four, 10, 16, 26, 32, 40 and 52 weeks postpartum in order to examine their infant feeding choices and parenting experiences during the first twelve months of their infant’s life. Women without online access are followed at home up by telephone.

A Curtin Alumni magazine article on the project was picked up by a previous Curtin university nursing graduate who is also a lactation consultant living and working in regional WA. This has resulted in the lactation consultant volunteering her time to provide one-to-one online feedback to women experiencing breastfeeding difficulties and/or answers to breastfeeding questions not provided on the intervention website.

Approach

In addressing the health issue of promoting breastfeeding and identifying factors which impact the breastfeeding outcomes of regional women the contextual framework of community organisation is applied. Community organisation emphasises community-driven approaches to assessing and solving health and social problems. In this community, regional health practitioners are taking up the research study in an effort to identify the barriers to successful breastfeeding in their region. Community organising is not a single mode of practice and often involves different approaches to bring about change. The concepts of community organisation in this research study are outlined in Table 1.

Table 1 Community organisation

Term	Definition	Potential change strategies
Empowerment	A social action process through which people gain mastery over their lives and their communities	Community members assume greater power by obtaining greater knowledge about breastfeeding practices in their region
Community capacity	Characteristics of a community that affect its ability to identify, mobilise around, and address problems	Community members participate actively in recruiting study participants and collecting data
Participation	Engagement of community members as equal partners; reflects the principle, “Never do for others what they can do for themselves”	Community members develop leadership skills, knowledge, and resources through their involvement
Relevance	Community organising that ‘starts where the people are’	Community members create their own agenda based on the needs of regional breastfeeding women identified from the data collection
Issue selection	Identifying immediate, specific, and realisable targets for change that unify and build community strength	Community members participate in identifying issues; targets are chosen as part of a larger strategy
Critical consciousness	Awareness of social, political, and economic forces that contribute to social problems	Community members discuss the root causes of problems and plan actions to address them

Adapted from (National Cancer Institute 2005)

Ethical considerations

The research protocol was approved by the Human Research Ethic committee of Curtin University of Technology. Ethics approval for the participation of the regional hospitals was provided by the Western Australian Country Health Services (WACHS) ethics committee. Signed informed consent was obtained from participants.

Data analysis

Statistical analyses were performed using the Statistical Package for Social Sciences, version 18.0 (SPSS for Windows; SPSS Inc., Chicago, IL, USA)(SPSS 2010). Data were analysed and described using frequency distributions to provide a descriptive report of the establishment of the study.

Results

Formative research

A total of 31 mothers were surveyed at the Geraldton Community Health Centre in the Midwest region of WA. Approximately 97% of the women responded that an interactive breastfeeding Website (featuring chat rooms, discussion boards, education seminars, face-to-face contact using webcam, information about breastfeeding and breastfeeding benefits) would be 'useful/extremely useful' to new mothers.

When asked about the various functions of the website 74% responded that a chat room for new mothers would be 'useful/extremely useful'; 81% responded that they would find discussion forums 'useful/extremely useful'; and 84% responded that they would find online education seminars 'useful/extremely useful'. The usefulness of a web camera to support breastfeeding was less supported with only 39% of women responding that they would find this 'useful/extremely useful', 48% undecided, and the remaining women either not responding or reporting that they would find this function 'not very useful'.

Website pilot

Throughout the three month pilot project the website was modified iteratively based on feedback from participants and project staff. Aspects of the website that were problematic and required modification included; the participant login, survey automation, control and intervention website content, automated generic response emails, randomisation of participants, recording of website statistics, correct grouping of emails to control and/or intervention group, survey reminders and redirection to online surveys via control and intervention websites, avoidance of junk mail boxes of participants, the use of SMS to email (SMS2email) technology and the maintenance of participants.

Study implementation

Participants

To date (November 2010) there are 122 women enrolled in the intervention study; 58 in the control group and 64 in the intervention group. Given the low numbers at this early stage, results are presented on the sample as a whole, and includes those women in both the cohort and the intervention study (n=122) as well as those who do not have computer access and therefore are not involved in the intervention but still make up part of this regional sample of mothers (n=4). Three women had declined and 11 women had withdrawn from the study at November 2010.

At discharge 85.3% of women were exclusively breastfeeding, that is, receiving breastmilk only with no other liquids or solids with the exception of drops or syrups consisting of vitamins, mineral supplements or medicines.(Webb, Marks et al. 2001) Approximately thirteen per cent of women had introduced artificial baby milk at the time of discharge.

Table 2 Characteristics of the regional infant feeding participants

Characteristic	RIFS participants (n=126)	
	n	%
Age (years)		
<20	1	0.8
20-24	13	10.3
25-29	42	33.3
30-34	42	33.3
≥35	28	22.2
Parity		
Primiparous	37	29.4
Multiparous	89	70.6
Education		
Did not complete high school	3	2.4
Completed high school/Trade/TAFE certificate	81	64.3
Bachelor degree or higher	42	33.3
Place of Birth		
Australia/NZ	113	89.7
UK/Eire	6	4.8
Other	7	5.6

Perceptions of the website

From ten weeks onwards all women are asked about their use of the internet and the intervention group was specifically asked about the intervention website. As not all of the cohort have completed all of the surveys, results are only presented for weeks 10, 16, and 26 for the intervention group only.

Table 3 Utilisation of websites by intervention group (%)

	Wk 10 (n=41)		Wk 16 (n=28)		Wk 26 (n=13)	
	Yes	No	Yes	No	Yes	No
Accessed any websites in last 10, 16 and 26 weeks?	13 (31.7)	28 (68.3)	10 (35.7)	18 (64.3)	7 (53.8)	6 (46.2)
Visited intervention website?	12 (29.3)	29 (70.7)	10 (35.7)	18 (64.3)	7 (53.8)	6 (46.2)

In a qualitative component of the website, women are asked to indicate the usefulness of the various intervention website pages. The majority of women reported either not visiting the various website pages or not recalling visiting the website pages. Those who did visit the website found the various pages 'useful' (see Table 4).

Table 4 Usefulness of intervention website by pages (%)

	Most useful	Very useful	Somewhat useful	Not very useful	Not useful at all	Unsure or Have not used this section	Total
Resources							
About breastfeeding	1 (8.3)	4 (33.3)	3 (25)	0	0	4 (33.3)	12
How are you feeling?	0	4 (33.3)	2 (16.7)	0	0	6 (50)	12
Involving dads	0	3 (30)	0	0	0	7 (70)	10
Mums and alcohol	0	4 (33.3)	1 (8.3)	0	0	7 (58.3)	12
Other useful websites	0	3 (25)	2 (16.7)	0	0	7 (58.3)	12
Support							
From the researcher	0	4 (33.3)	1 (8.3)	0	0	7 (58.3)	12
From the Australian Breastfeeding Association	0	3 (25)	2 (16.7)	0	0	7 (58.3)	12
The Forum	1 (7.7)	3 (23.1)	4 (30.8)	0	0	5 (38.5)	13

In an open ended question women are asked to report what they like most about the website. The most popular responses include 'the forum', easy to navigate/understand and the ability to share experiences with other mums. In the alternate question the responses are more varied and ranged from 'not liking the colours' on the website to 'not many people using the website'.

In an attempt to understand why some mothers are not using the website, mothers are asked to indicate their reasons for not visiting the website from a predetermined list. Table 5. outlines the answers to this multi response question. No women have used the webcam function to help with position and attachment.

Table 5 Reasons for mothers not accessing intervention website (%)

Response	Total
Too busy with my new baby	4 (66.7)
Too busy managing the household	3 (50)
Have been away from home	2 (33.3)
Haven't been interested in looking at it	1 (16.7)
Busy with baby and doing my 'uni'	1 (16.7)

Discussion

This paper presents the preliminary results from the research study which aims to investigate the usefulness of an internet intervention in supporting breastfeeding mothers in regional WA. The primary hypothesis of this research is that women exposed to the intervention website will demonstrate better breastfeeding outcomes than women not exposed. Despite being unable to conclude an effect on the breastfeeding outcomes of the intervention group at this early stage the development process for this cohort study with a nested intervention, has provided many successes.

In addition to the development of a personalised and secure intervention website tailored to the needs of regional women, the website has managed to create a virtual community for new mothers in regional WA as evidenced by this comment on the Forum from one mother to another;

'20km's out of Gero south or north? I live south side do you live in Gero as well? I know what you mean by taking years to get friends here, Doesn't help that Gero is such a clicky place either, well that's how I found it so far I been here for just over 2 years now and still feel like a stranger in my parents' group.'

At this early stage of the intervention there is limited use of the website by participants which can be explained by the busy post hospital circumstances which new mothers often experience and have reiterated here. Despite this there appears to be a growing trend in the use of other social media (*facebook, FarmVille*) which may be competing the limited computer time that new mothers have and preference maybe given to more advanced social media interactions. Additionally, it has been suggested that although e-Health websites are popular and may have a large membership, it is often 10% or less of the member population that post on the website forums. Website members often have their queries answered by reading through the forum posts and therefore have no need to post a comment.(Uridge 2010)

Video support post discharge may have the potential to overcome early breastfeeding difficulties of positioning and attachment, which are crucial to the establishment and maintenance of breastfeeding. Despite this, women in this study were not as amenable to this support as the other services provided on the intervention website and it is possible there are concerns with the privacy and security of the video link.(Roberts, Hoddinott et al. 2009)

The first published article on Web-based breastfeeding support was by Cheng et al in 2003. This research investigated the preferred Web-based program of new parents.(Cheng, Thompson et al. 2003) Since this time there has been a proliferation in breastfeeding support websites (Australian Breastfeeding Association, La Leche) however there is still little known regarding 'best practice' in this area.

Roberts and colleagues have demonstrated the use of multiple communication methods to be best when trying to reach breastfeeding women, however they found the use of face-to-face contact with health professionals to be the preferred method of communication.(Roberts, Hoddinott et al. 2009) In our study women are still able to contact their local health care provider, and face-to-face contact on the website is available only through webcam support. To date no participants have utilised this service and given the anxieties regarding video contact, women in our study may still be seeking personal contact with their preferred health professional.

In a French study which assessed whether home access to e-technologies (e.g. CD-ROM) was associated with better breastfeeding outcomes, approximately 79% of mothers had access to e-technologies and 65% had access to the internet.(Laborde, Gelbert-Baudino et al. 2007) In this study mothers with access to e-technologies had longer median breastfeeding duration than those without access however access to e-technologies was not independently associated with breastfeeding duration in multivariate analyses.

Research indicates that receiving individualised breastfeeding information in both the antenatal and postnatal period is associated with better breastfeeding outcomes.(Pannu, Giglia et al. 2010 *in press*) It is anticipated that the successful involvement of the volunteer lactation consultant will provide further individualised support and strengthen positive breastfeeding outcomes in these regional women.

The adoption of this project by seven additional hospitals in two health regions of WA has illustrated an impetus for the involvement in this research study by hospital midwives, child health nurses and regional dietitians. The involvement of this community of regional health practitioners can partially be explained by community-level models that explore how social systems function and change to mobilise community action. Embodying an ecological perspective, community-level models address individual, group, institutional, and community issues.(National Cancer Institute 2005) In this instance our communities are both defined geographically and by the unique characteristics of their profession, that is maternity ward staff, child health nurses and regional dietitians.

Conclusion

Support in the early postpartum stage is paramount for sustaining continued breastfeeding. Internet technologies are convenient, less time consuming and inexpensive for mothers, particularly those that may have to drive long distances to access a health professional. It is anticipated that access to this intervention will help add to those breastfeeding support services already available in the community and provide timely follow up care post discharge that will ultimately result in a mother's maintenance of breastfeeding.

Initially planned as a contained intervention study to determine the effect of an internet intervention on breastfeeding outcomes in regional WA, this study has developed into one of the largest prospective regional cohort studies on breastfeeding in Australia. Originally implemented in the Midwest region of WA this study

has captured the interest of dietitians, child health nurses and midwives statewide. It is likely that the prospect of robust local breastfeeding data that can inform and direct breastfeeding policy and practice at the local level is inspiring others to come on board.

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