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Cancer prevention – the feasibility and acceptability of promoting breast cancer risk reduction in the screening setting through a lifestyle magazine

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3 **Cancer Prevention – the feasibility and acceptability of promoting breast cancer risk**
4 **reduction in the screening setting through a lifestyle magazin**
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Abstract

Cancer prevention and early detection strategies are fundamental to reducing breast cancer burden. Offering prevention guidance on modifiable risk factors within early detection settings is rare. We aimed to evaluate the acceptability of a magazine focused on lifestyle and cancer prevention for use in breast screening clinics. A lifestyle magazine was developed and distributed within two breast screening settings in the West of Scotland over a 2 month period. Women were either offered the magazine on arrival or in a self-service format. Uptake was recorded by NHS staff. Women's views were sought via an evaluation questionnaire. Staff were interviewed on their experiences of intervention delivery. Uptake was greatest when offered to attendees (95% vs 20% self-service). The evaluation questionnaire response rate was 17.3%. Almost 60% of respondents reported an increased knowledge about breast cancer and lifestyle and felt motivated to find out more about cancer prevention and 40% expressed intentions to make lifestyle changes. Over 90% of respondents thought lifestyle factors were important in breast cancer prevention. Staff feedback was positive, indicating no detrimental effects on workloads. In conclusion, a cancer prevention lifestyle magazine can be successfully delivered in the breast screening setting and deserves further exploration for roll out.

Introduction

Cancer prevention and early detection strategies are seen as the cornerstone to reducing both the incidence of and morbidity from breast cancer. However, to date, few attempts have been made to offer prevention guidance within early detection settings (Anderson, Mackison, Boath & Steele 2013)

Whilst many factors are implicated in aetiology (Howell et al, 2014) current estimates suggest that around one third of breast cancers in post-menopausal women in the UK are related to body fatness, physical inactivity and alcohol consumption (Cancer Research UK 2014; World Cancer Research Fund 2015). Ahn et al. (2007) reported that at any BMI, weight gain in adult life is associated with greater risk of breast cancer and a gain of 2–10 kg after the age of 50 is associated with a 30% increase in breast cancer risk. More recently, Neuhouser et al. (2015) reported that post-menopausal women with a BMI < 25 kg/m² at baseline, who gained > 5 kg of body weight during a 13 year follow up period, had a 36% increased risk of developing breast cancer.

Recent qualitative formative research for the a face to face lifestyle intervention to reduce breast cancer risk factors highlighted issues regarding the communication of lifestyle messages to women in the breast screening setting (Conway et al. 2016). Health promotion challenges included beliefs about fate, family history and luck as causes of breast cancer. Considerable suspicion and confusion were expressed about the role of lifestyle and the way messages were communicated (“preachy”).

The aim of the current work was to develop a lifestyle magazine for use in breast screening clinics in order to:

- a) provide key lifestyle breast cancer risk reduction information to a lay audience in an informative, interesting and useful manner
- b) increase the credibility of current scientific knowledge around modifiable lifestyle behaviours, screening and early detection
- c) support behavioural intentions to improve diet, physical activity and body weight

The magazine was not meant to replace NHS materials but to complement existing lifestyle communications. An evaluation was undertaken as part of service delivery.

Methods

Development

A review of popular women's magazines, whose target audience included women aged 50 + years, was undertaken which showed that four positive themes were common: a 'chatty' (rather than scientific) tone, celebrity/royalty features, use of brightly coloured images and the addition of a free gift. The final format of the magazine was similar to the Scottish Cancer Prevention Network (SCPN) newsletter (SCPN 2015) comprising an editorial, scientific evidence, activities by cancer charities, the provision of expert advice, recipe, interview and quiz. The Thingymaboob¹ (produced by the Canadian Cancer Society) was identified as a suitable 'free gift'.

Breast cancer charities were invited to contribute to the magazine and endorse it by the addition of their logo to demonstrate solidarity in messaging from credible sources.

A draft of the magazine was circulated to the Scottish Government Detect Cancer Early team, relevant NHS staff working in health promotion and cancer screening and the members of the Scottish Cancer Prevention Network for discussion and amendment of content and format.

The final version of the magazine called "Better Living, Better Health" comprised 24 pages in full colour print (Scottish Cancer Prevention Network 2015) and was cellophane wrapped to include the feedback questionnaire, freepost envelope and free gift.

Implementation

The magazine delivery was evaluated in the West of Scotland Breast Screening Service, Glasgow, over a two month period. Both the static screening clinic in central Glasgow (a more affluent area) and a mobile unit based in Govan (a less affluent area) participated in the delivery in order to reach attendees from a variety of sociodemographic backgrounds.

In the first month, all women were offered the magazine on arrival at the screening centre or mobile van by the receptionist and informed that this was a free magazine to keep. An insert evaluation questionnaire was also highlighted. In the second month the magazine was left on display in the waiting room areas with a poster inviting women to take a copy of the free magazine home (self service).

The number of magazines given out or picked up and the number remaining in the clinic (i.e. not taken home) were recorded daily by clinic staff. University staff visited the screening centre on two

¹ This key ring comprises graduated pink beads, the largest of which represents the size of a lump found by women doing regular breast self-examination to the smallest representing the average size of a lump identified by regular mammograms. Its aim is to show how important mammograms are in detecting breast cancer at its earliest stage. <https://www.facebook.com/NHSHighland/videos/vb.166752783339246/1183186855029162/?type=2&theater>

1 occasions and had regular email contact in order to see the work being carried out and to attain
2 feedback.
3
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6 **Evaluation**

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8 To test acceptability, a two sided (13 questions) anonymous evaluation questionnaire was
9 developed after internal pilot testing using face validity assessments with a convenience sample of
10 adults aged over 50 years (Appendix 1). All questions were in closed format with an opportunity for
11 free text comment at the end. The questionnaire was accompanied by a freepost envelope.
12
13

14
15 The questionnaire collected information on socio-demographic data (postcode to identify residential
16 area for Scottish Index of Multiple Deprivation (SIMD) classification (Scottish Government 2012),
17 age band, marital status and employment category), screening history and how the magazine was
18 delivered. Women were invited to select as many of the eight available descriptors as they felt
19 appropriate to describe the magazine (useful, informative, interesting, appropriate, unappealing,
20 boring, irrelevant and alarming). Three items queried whether they (after reading the magazine) felt
21 their knowledge, motivation to find out more or willingness to make lifestyle alterations had
22 changed (“After reading the magazine my **knowledge** about breast cancer and lifestyle has
23 increased”, “**I feel motivated** to find out more about how to prevent breast cancer”, and “I would
24 like to **make some changes** to my lifestyle”). For each of these items four possible options were
25 offered ranging from “a great deal” to “not at all”. In addition the questionnaire asked how
26 important respondents thought it was for women to watch their weight, alcohol intake and physical
27 activity in relation to breast cancer prevention. Four responses were offered from “very important”
28 to “not at all important” and a “don’t know” option was also added.
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39 At the end of the implementation period, breast screening staff, were interviewed about the work
40 burden, response from attendees and their general observations about the project.
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43 **Data analysis**

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45 Quantitative data analysis was undertaken using IBM SPSS Statistics for Windows (IBM Corp:
46 Version 21.0. Released 2012. Armonk, NY). Descriptive statistics were used to characterise
47 questionnaire respondents. Results are presented as percentages.
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51 Staff interview data were audio-recorded with participant consent and transcribed verbatim.

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53 Transcripts were analysed thematically.
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Ethical approval

Following submission of the project to the HRA decision tool (<http://www.hra-decisiontools.org.uk>) we were advised by the East of Scotland Research Ethics Service that this service evaluation would not require an NHS Rec review (13/3/15)

Results

Uptake

Magazines were distributed in August and September 2015.

More than half (57%) of all screening centres attendees took the magazines home (Table 1). Uptake was greatest when it was personally given to attendees (95%) compared to the self-service delivery route (20%) in both settings. Display magazines were more likely to be taken by attendees in the mobile van compared to static centres (26.4% vs 18.4%). Overall, uptake was higher in the static clinic (57.9%) compared to the mobile van (53.5%).

Response to evaluation questionnaires

The response rate to the evaluation questionnaire was 17.3% (n=375). Three quarters (74.7%) of respondents had received their magazine from the receptionist. Respondents spanned the routine screening age range and came from a wide range of sociodemographic backgrounds. More than half were from the two least deprived quintiles of the SIMD. Most respondents were married (68.6%), 42% were in fulltime employment and 53% were retired. The majority (74.9%) of respondents had been screened several times before (Table 2).

Knowledge and perceptions of lifestyle factors and breast cancer prevention

Most respondents (95%) reported that reading the magazine had increased their knowledge about breast cancer and lifestyle to some extent (Table 4); that they felt motivated to find out more about and expressed intentions to make lifestyle changes after reading the magazine. These results were similar by social background

Free text responses

Of the 375 questionnaire responses, 119 free text comments (32% of respondents) were received when asked the question ‘Would you like to tell us anything else about the magazine?’ Six main themes were identified:

- a) **Format and content:** Overall the magazine format, layout and content of the magazine were universally supported. Readability, interest and information were also commented on positively.

“What a great idea it is to convey the information in magazine form.”

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4 b) **Personal reflections on information:** Many respondents reflected on their own lifestyle habits.
5 Some said they knew much of the information contained in the magazine but that it was a useful
6 reminder and motivated renewed attention to lifestyle choices. For others, information on the
7 link between lifestyle and *cancer risk* was new. Some respondents were sceptical about the link
8 between health behaviours and cancer risk. Many reported they intended to make lifestyle
9 changes as a result of reading the magazine.
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15 “I had no idea of the statistics until I read the magazine.”
16

17 “I live a fairly healthy lifestyle and I know where I could improve so in that respect the
18 magazine wasn't really 'useful'. However, it is always good to remind and reinforce.”
19
20

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23 c) **Sharing and cascading:** Many respondents indicated they had passed the magazine on to family
24 members or work colleagues.
25

26
27 “I found it so informative I passed it on to my daughter-in-law.”
28

29 “I'll take it in to my work place for colleagues to read.”
30
31

32 d) **Suggested improvements:** Some practical suggestions were given for improvements to the
33 magazine many relating to practical hints and advice such as “*cooking for one*” and “*sugar free*
34 *recipes*”.
35

36
37 e) **Negative responses:** In total, 15 people made negative comments ranging from cost, to use of
38 NHS resources and a spelling error.
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40

41 **Interview data**

42 Face to face semi-structured interviews were conducted with members of breast screening staff (a
43 senior clinician, two radiographers, and support staff).
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47 Preparatory work was highlighted as key to the success of the project.
48

49
50 “I do think it’s important to set the scene and not just have people say “where did that come from?
51 And that was very easy to do and we have a good system of doing that and it didn’t really impact
52 too much on our workload. ”
53

54
55 Positive opinions were reported about the magazine content and format.

56
57 “Women’s Health [leaflets] they are just so condescending and you think we’re not stupid, but it
58 was short enough, that it wasn’t preaching, it was just this is what we found this is what we think
59 and it was very much this is what the evidence is saying.”
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4 Acceptability to women – was this the right environment to distribute the magazine?
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8 “I think so, it is a screening service, so...the reasons why you’re going there, you would want to
9 read about healthy things”
10

11 “I would like to think it would maybe encourage them [to attend future screening]”
12

13 It was felt that the magazine displayed care for the women beyond the breast screening process.
14

15
16 “They [women] went away feeling like they’d got something from it, it wasn’t just right your x-ray
17 is done and out, there was a bit of a conversation and they definitely learned something from it.”
18

19 The handing out of the magazines did not seem to have a detrimental effect on workload. On the
20 mobile unit there was more of an impact and less time to engage with women but it was
21 manageable.
22
23

24
25 Conversations were struck up about the magazine/Thingymaboob, most commonly in the static unit
26 with the attendants in the waiting rooms and cubicles. Staff regarded this as a positive opportunity
27 to engage with women and help them to relax in what can be an anxious few minutes.
28
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31 “It was nice to engage with the ladies because sometimes they sit in the cubicles and it’s total
32 silence...it’s a way of broaching conversation, because you know they would say what’s that
33 about, or we would say to them have you seen this, this is what they’re trying to do.”
34
35

36 “There was a load of the ladies that you wouldn’t expect to ask the questions that did.”
37

38 Discussion

39
40 The NHS Scottish breast screening programme (NHSSBSP) provides a unique opportunity for
41 delivering an intervention aimed at breast cancer risk reduction which is consistent with the concept
42 of the NHS as a health promoting service (National Health Service Health Scotland 2016). Fisher et
43 al (2007) reported that most women attending screening clinics are interested in receiving lifestyle
44 advice and an updated paper (Fisher, Wilkinson & Valencia 2016) reporting the view of 1803
45 women shows overwhelming support for receiving interventions through this setting. No routine
46 lifestyle guidance is provided at Scottish breast screening clinics and failure to advocate lifestyle
47 change in a cancer screening setting could endorse poor health behaviours by providing a “health
48 certificate” effect (Anderson et al 2013; Berstad et al 2014).
49

50 In Scotland, there are few initiatives directed at motivating change in diet and physical activity in
51 women aged over 50 years despite recent 3 year cumulative data from the Scottish Health Survey
52 reporting that 72% of women aged 55 to 74 years have a BMI >25kg/m². Furthermore, 42% of
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1 women do not achieve the recommendation of 150 minutes of physical activity per week. In 2012,
2 35% of Scottish women exceeded the recommended maximum weekly alcohol drinking levels
3 (Bromley et al 2013).
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7 Whilst the NHSSBSP setting looks promising for initiating interventions, creative routes are needed
8 to engage women to undertake sustained lifestyle changes that are cost effective and have no
9 deleterious impact on the screening service. Such routes may include programs promoting healthy
10 lifestyles, communication, marketing and partnering, mobilization of social networks, peer
11 persuasion as well as more traditional written communications. Ongoing work in this area includes
12 offering lifestyle coaching through the NHS breast screening service highlighted in Scotland's
13 cancer strategy (ActWELL study) (Scottish Government, 2017)
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19
20 Whilst the current work was modest in delivery, the results demonstrate that NHSSBSP staff are
21 able to facilitate the provision and uptake of breast cancer prevention materials with little disruption
22 to normal services. The personalised delivery by reception staff was notably successful and a very
23 clear endorsement by the NHS. The magazines were distributed to women from a wide range of
24 backgrounds although the questionnaire returns were largely from women living in more affluent
25 areas and cannot be considered representative of the screening population overall. The response rate
26 was similar to that of a survey on symptom awareness (15 to 23%) carried out by Breakthrough
27 Breast Cancer (Scotland) (Personal Communication) in 2014 indicating an interest in the topic even
28 although lifestyle is not the core business of screening clinics.
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35 Despite the plethora of information on lifestyle from multiple media sources it is interesting that
36 most respondents reported that reading the magazine had increased their knowledge about breast
37 cancer and lifestyle. It is unlikely that increasing knowledge and awareness *per se* will promote
38 behaviour change (Wardle, Parmeneter & Waller 2000), but both are important prerequisites and
39 platforms to develop evidence based behavioural change techniques for planning health
40 improvements.
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46 It is not possible to assess whether knowledge about lifestyle risk has improved after reading the
47 magazine as no baseline results are available and the work was not undertaken as a controlled study.
48 Our results rely on self-reported assessments which are commonly used in social psychology (e.g.
49 behavioural intentions). However the results show that the majority of women who have read the
50 magazine and responded to these messages are now aware of these factors in relation to breast
51 cancer prevention.
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56 The open comments provided many reassuring comments about format and content and indications
57 that this style of communication was acceptable. The content was deliberately aimed at widening
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1 health perspectives beyond breast cancer risk (e.g. sun protection, recipes) to try and engage a wide
2 audience and there were no comments to suggest that this was inappropriate. The personal
3 reflection and comments indicate that the magazine had prompted people to examine aspects of
4 their own lifestyle not simply enhance knowledge. Spontaneous comments about respondents
5 wishing to share the resource were particularly pleasing and suggest a gap in the public health arena
6 of such communications. Few negative comments were received and several of these could be
7 addressed with further editing.
8
9

10 Comments from staff show that they personally liked the content and magazine style (notably the
11 wider health content beyond breast cancer) and that they were also comfortable with its use in the
12 screening clinic. In addition, their observations on patients reading the magazine in clinic, and
13 patient feedback to them, suggests an overall positive experience. Importantly the effort involved
14 was minimal and there were no reports of detrimental effects on workloads although experience of
15 engaging in further conversation on prevention and screening varied.
16
17

18 In conclusion, a cancer prevention magazine designed and written by the SCPN using a women's
19 magazine style was successfully delivered in the breast cancer screening setting. Feedback from
20 staff and screening attendees was overwhelmingly positive and deserves further exploration for roll
21 out across Scotland.
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23

24 **List of abbreviations**

25 SCPN – Scottish Cancer Prevention Network

26 SIMD - Scottish Index of Multiple Deprivation

27 NHSSBSP - NHS Scottish breast screening programme
28
29

30 **Transparency Declaration**

31 The lead author affirms that this manuscript is an honest, accurate, and transparent account of the
32 study being reported, that no important aspects of the study have been omitted and that any
33 discrepancies from the study as planned (and registered with) have been explained. The reporting of
34 this work is compliant with CONSORT/STROBE/PRISMA guidelines.
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36

37 **Competing Interests**

38 All authors declare that they have no competing interests.
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1
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3

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7 this initiative.
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9

10
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12

13
14 **Authors' contributions**
15

16 MM contributed to study design, developed magazine content, conducted the study, performed data
17 analysis, and prepared the first draft of the manuscript which was revised by all authors.
18

19
20 ASA had the original idea, obtained funding, led on study design and revised the final manuscript.
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25 **Keywords:** Prevention, Breast cancer, Nutrition, Patient information.
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Tables List

Table 1 Uptake of magazines by screening centre and implementation method

Table 2 Demographic characteristics of questionnaire responders

Table 3 Descriptors selected

Table 4 Impact of the magazine on women's knowledge and perceptions of cancer risk

For Peer Review

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	At static centre		In mobile van		Total	
	Screened n=	Uptake n(%)	Screened n=	Uptake n(%)	Screened n=	Handed out/taken n(%)
August (Handed out by receptionist)	1408	1392(98.9)	464	380(81.9)	1872	1772(94.7)
September (On display to take)	1460	269(18.4)	488	129(26.4)	1948	398(20.4)
Total	2868	1661(57.9)	952	509(53.5)	3820	2170(56.8)

Table 1 Uptake of magazines by screening centre and implementation method

Table 2 Demographic characteristics of questionnaire responders

	n(%)	
Age	50-55	96(25.6)
	56-60	78(20.8)
	61-65	93(24.8)
	66-70	75(20.0)
	Over 70	33(8.8)
Marital status	Single	19(5.1)
	Married/cohabiting	256(68.6)
	Widowed/separated/divorced	98(26.3)
Employment status	Retired	197(53.4)
	Unemployed	16(4.3)
	Employed full time	155(42.0)
	Employed part time	0(0)
	Student full time	1(0.3)
	Student part time	0(0)
SIMD quintiles	1 (most deprived)	33 (9)
	2	35 (9)
	3	33 (9)
	4	42 (11)
	5 (least deprived)	175 (47)
	Missing	56 (15)
Screening visit	First screening	46(12.3)
	Second screening	48(12.8)
	Has been screened several times	280(74.9)

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Table 3 Descriptors selected

	n(%)
Useful	182(48.5)
Informative	268(71.4)
Interesting	239(63.7)
Appropriate	174(46.4)
Unappealing	1(0.3)
Boring	1(0.3)
Irrelevant	1(0.3)
Alarming	2(0.5)

For Peer Review

Table 4 Impact of the magazine on women's knowledge and perceptions of cancer risk

After reading the magazine....		All n(%)	Most deprived* n(%)	Less deprived* n(%)
My knowledge about breast cancer and lifestyle has increased	A great deal/ Quite a lot/A little bit	356(95.2)	66(98.5)	228(95.4)
	Not at all	18(4.8)	1(1.5)	11(4.6)
I feel motivated to find out more about how to prevent breast cancer	A great deal/ Quite a lot/A little bit	352(94.6)	64(97.0)	226(94.6)
	Not at all	20(5.4)	2(3.0)	13(5.4)
I would like to make some changes to my lifestyle	A great deal/ Quite a lot/A little bit	352(94.4)	64(95.5)	225(94.1)
	Not at all	21(5.6)	3(4.5)	14(5.9)

*Most deprived from SIMD quintiles 1 and 2; less deprived from SIMD quintiles 3-5

Appendix 1

Evaluation questionnaire

1. I am attending breast screening for:

- a. the first time
- b. the second time
- c. I have attended several times

2. I received the magazine:

- a. From the receptionist on arrival
- b. From the waiting area

3. I found the magazine (please circle all that apply)

- a. useful
- b. informative
- c. interesting
- d. appropriate
- e. unappealing
- f. boring
- g. irrelevant
- h. alarming

4. After reading the magazine my knowledge about breast cancer and lifestyle has increased

- a. A great deal
- b. Quite a lot
- c. A little bit
- d. Not at all

5. After reading the magazine I feel motivated to find out more about how to prevent breast cancer

- a. A great deal
- b. Quite a lot
- c. A little bit
- d. Not at all

6. After reading the magazine I would like to make some changes to my lifestyle

- a. A great deal
- b. Quite a lot
- c. A little bit
- d. Not at all

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2
3 7. How important do you think it is for women to watch their weight to help prevent breast
4 cancer?

- 5
6 a. Very important d. Not at all important
7 b. Quite important e. Don't know
8 c. A little bit important
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11 8. How important do you think it is for women to watch their alcohol intake to help
12 prevent breast cancer?

- 13 a. Very important d. Not at all important
14 b. Quite important e. Don't know
15 c. A little bit important
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19 9. How important do you think it is to for women to watch their physical activity level
20 to help prevent breast cancer?

- 21 a. Very important d. Not at all important
22 b. Quite important e. Don't know
23 c. A little bit important
24

25 10. Please indicate your age group:

- 26 a. 50-55 d. 66-70
27 b. 56-60 e. over 70
28 c. 61-65
29
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32 11. What is your postcode? _____
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34 12. How would you describe your marital status?

- 35 a. Single c. Widowed / separated / divorced
36 b. Married / cohabiting
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40 13. How would you describe your employment status?

- 41 a. Retired d. Employed part-time
42 b. Unemployed e. Student full-time
43 c. Employed full-time f. Student part-time
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47 Would you like to tell anything else about the magazine?
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59 Thank you very much for your contribution.
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Once completed please return this questionnaire to us in the reply paid envelope.

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