

Factors influencing health behaviors of younger women after menopause-inducing  
cancer treatment

**Abstract**

**Objective:** To investigate the health promotion and risk reduction behaviors of younger women previously treated for cancer.

**Design and sample:** Guided by the 'Precede-Proceed' framework, a mixed-method descriptive investigation of the health behaviors of younger women with cancer treatment-induced menopause in one health jurisdiction in Australia was undertaken.

**Measures:** This paper reports the results of the qualitative interview component of the study.

**Results:** Of the 85 women who responded to surveys that quantified their health behaviors, 22 consented to interviews that explored how and why these behaviors might occur.

**Conclusions:** Several predisposing, enabling and reinforcing factors that influenced participants' will or ability to engage with health-promoting behaviors after cancer treatment were identified in the interviews. These include entrenched pre-cancer diagnosis health behaviors, the disabilities resulting from cancer treatments, perceptions of risk, focused intervention by health professionals and the nature of participants' social support. The results indicate a need for flexibility when planning public health initiatives to prepare this cohort for a healthy life after cancer, which accounts for their developmental, knowledge and post-treatment needs.

**Keywords:** Health behavior, cancer survivor, treatment-induced menopause

## Background

Recent advances in detection and treatment mean that cancer is now often conceptualised as a chronic and sometimes curable disease, rather than an invariably fatal one (Demark-Wahnefried, Aziz, Rowland, & Pinto, 2005; Naus, Ishler, Parrott, & Kovacs, 2009; Parkin & Fernandez, 2006). The notion of 'chronicity' is extremely important in this context, because even when the cancer is eradicated, cancer treatments can leave people with a range of long-term health disturbances that will, in this increasingly numerous cohort, need to be accommodated by public health planners. For example, younger women treated for cancer are particularly at risk of ovarian failure and its related problems of earlier, more severe vasomotor symptoms and infertility (Girgis & Butow, 2009); osteoporosis and osteoporitic fractures (Courneya, 2009); and memory problems (Evens & Eschiti, 2009). Prior treatment for cancer can also increase their risk of developing second primary cancers (Pollard, Eakin, Vardy, & Hawkes, 2009) and a range of comorbidities such as heart failure (Cheng & Force, 2010), peripheral neuropathy (Baker et al., 2008) and ongoing fatigue (Eakin et al., 2006).

While many of these problems are believed to be amenable to dietary, exercise, screening and other public health initiatives, recent population data indicate that cancer survivors do not necessarily adopt these behaviors (Blanchard, Courneya, & Stein, 2008; Nathan et al., 2009; Pollard, et al., 2009). For example, one US study of the lifestyle behaviors of 9,105 people previously treated for cancer reported that few met the recommendations regarding smoking, physical activity or fruit and vegetable consumption (Blanchard, et al., 2008). Other US data indicate that long-term survivors of hematological cancers are more likely to use tobacco,

ingest alcohol and practice sedentary lifestyles at higher rates than is ideal, given their medical history (Nathan, et al., 2009). Furthermore, as few as 18% of these individuals discuss their cancer history with their regular doctor, which would ideally include the ordering of screening tests to detect recurrence and advice regarding health promotion and risk reduction after cancer treatment (Nathan, et al., 2009). Hence there is genuine reason to believe that cancer survivors' longer term health might be at risk.

The reasons for this have not been subjected to systematic research. It is increasingly recognized, however, that while significant public health resources are now concentrated on strategies that aim to reduce health risks in the general population, much less consideration is given to promoting healthy lifestyles in people previously treated for cancer (Gritz et al., 2005; Pollard, et al., 2009). In particular, little is known about these issues as they relate to younger women who experience menopause as a result of their cancer treatment in Australia; and the resources they require to help them prepare for early menopause and other longer-term treatment toxicities. This study sought to investigate these issues in our health service catchment

### **Research Question**

What are the health promotion and risk reduction practices of younger women with cancer treatment-induced menopause from six separate sites in our large health jurisdiction in Australia?

## Method

### Design and Sample

This mixed-method descriptive study was guided by the first three phases of the eight-phase Precede-Proceed model of health promotion developed by Green and Kreuter (Green & Kreuter, 2005). The first three phases comprise the 'diagnostic' or 'Precede' component of the model, in which the health needs, desires, strengths, problems, resources and environment of participants are mapped. From this assessment, the issues amenable to health intervention in that particular group are identified. Phases 4 to 8 of the model (the Proceed component) develop, implement and evaluate health promotion interventions based on the Precede assessment and diagnosis.

The survey results (paper under review) indicated the prevalence and type of health behaviors respondents practiced. Interviews with individuals from this cohort helped to further our understanding of how and why the behaviors documented in the surveys were evident. This paper presents the findings and interpretation of the in-depth interviews, which focused upon the factors that predisposed, enabled and reinforced the ability of participants to practice the recommended post-cancer treatment health behaviors. Unconditional ethical approval was obtained from the university and all facilities from which participants were recruited. All women in the study met the following inclusion criteria. They:

1. Were 18 years or over and legally able to consent at the time of the study.
2. Had completed any form of initial menopause-inducing cancer treatment (radiotherapy, chemotherapy, surgery) at least 3 months previously OR had completed initial cancer treatment at least 3 months previously and were

currently prescribed maintenance therapy in the extended phase that induced ovarian hormone blockade. This ensured that the participant had experience of the longer-term aspects of survivorship and was able to discuss it from that perspective .

3. Were able to speak and read English.

### **Measures**

Individual audio-taped interviews were undertaken at a time and place convenient to participants. Interviews ranged from 90 minutes to three hours. The interview guide contained open-ended questions derived from Precede that explored all of the indicators within the framework related to participants' exercise and dietary habits, their health, morbidity and quality of life, as well as their perceptions of the determinants of these factors. The interview data were transcribed and analyzed as soon as possible after each interview.

### **Analytic strategy**

Data analysis was undertaken individually by AM for the entire interview dataset and RT for the breast interview subset, using the following strategy:

1. Simultaneously listening and re-listening to the interview tapes, and reading and rereading the transcripts.
2. Ordering each transcript into a manageable form by sorting each interview into individual indicators then collapsing these into broad categories of predisposing, enabling and reinforcing factors. Hence *predisposing factors*, which represent the person's motivation for health behavior, were developed around each

participant's health knowledge, attributes, beliefs, values and perceptions, as well as their socio-demographic circumstances. *Enabling factors* established the community-level resources and barriers that helped or hindered participants' health behaviors. Examples of enabling indicators established in this category were the availability and accessibility of cancer support groups, medical practitioners and sporting facilities. A third category of *reinforcing factors* was also developed. Consistent with the Precede framework, this category comprised the interpersonal processes that provided participants with rewards and feedback for health behavior. For this category, the data were mined for participants' descriptions of how the attitudes and actions of peers, family, health professionals, employers and social support groups encouraged or discouraged their adoption of, or adherence to, health behaviors.

3. The categories and associated indicators from each transcript were then collapsed into a summary template that was parsimonious but captured the breadth of participants' experiences.
4. All of the investigators reviewed the raw data and the initial findings. They were then discussed intensively within the group until consensus on the findings and interpretation by way of the Precede model was reached. This iterative analysis and interpretation process articulated the predisposing, enabling and reinforcing factors that might be possible targets for health educational interventions in this cohort in this specific practice context.

## Results

The survey data indicated the prevalence and type of health behaviors respondents practiced. While the survey data are reported in detail elsewhere, in

summary we found that the health knowledge and practices of respondents, while often more conducive to good health than those of the average Australian woman, were nonetheless risky in many respects. The survey data indicated, for example, that the women had little awareness of the need for regular medical check-ups to help detect treatment-related comorbidities and second primary cancers. They drank more alcohol than is considered safe; and, given the potential of exercise to improve bone density in the context of post-menopausal osteoporosis, they did not describe adequate exercise habits (World Cancer Research Fund and American Institute for Cancer Research (WCRF/AICR), 2010). Moreover, some aspects of participants' dietary practices were not conducive to health maintenance and cancer risk reduction. The survey data indicated that this group might particularly benefit from education about the association of alcohol, fat and simple carbohydrates with increased endogenous estrogen levels, which predispose women to the development or recurrence of breast tumors and other comorbidities (World Cancer Research Fund and American Institute for Cancer Research (WCRF/AICR), 2010).

Twenty two of the 85 surveyed women consented to the 'request for interview' attached to the survey form. These 22 interviews afforded much insight into why the behaviors documented in the surveys were evident. Within the Precede framework, it is these factors that should be targeted when planning public health programs for specific groups.

The 22 interview participants comprised one ovarian, nine breast and 12 hematological cancer survivors, proportions consistent with the survey component of the study. Their average age at the time of diagnosis was 39 years, ranging from 16 to 47 years. Their average age at the time of interview was 44 years, ranging from

19 to 67 years. The average time since diagnosis was five years, ranging from 6 months to 15 years. Participants had all received Grade 12 education or beyond. Their occupations ranged from university study; nursing; pharmacy; secondary and university teaching; creative art; and several owned and managed small- to medium-sized businesses. All but 6 of the women were working or studying full time. Of those who were not working, one was a full-time mother, one had retired at 65 years of age and the other 4 could not work due to the after effects of their cancer treatments. These demographics are also reasonably consistent with the survey component.

### **Predisposing Factors**

Within the Precede framework, predisposing factors are seen as motivators to action. Physiological, demographic and psychosocial considerations are equally important within this category. Hence a first task was to establish genetic, disease- or treatment-related issues within the cohort and to determine whether they predisposed the participants to develop health problems that precluded them from engaging with health behaviors. These factors then need to be understood in the context of the individual and collective variables that could also predispose the uptake of health behaviors. These ideas are considered in this section.

The interviews did not indicate that dissonant health values or beliefs contributed to any of the risky dietary or exercise behaviors participants described. All of the participants tried to practice a healthy lifestyle after cancer treatment, with varying levels of success. Dietary and exercise habits in this context were significantly influenced by the disabilities that resulted from treatment, and which

undermined their good intentions. For example, in the longer-term aftermath of treatment, all of the participants rated their health status as much lower than it was before diagnosis. All participants reported mild to severe problems with memory, loss of muscle and joint strength, and ongoing mild to moderate fatigue. There were, however, marked differences between cancer types as to the most disabling symptoms. For example, a major source of exercise-inhibiting pain for the breast cancer cohort was lymphedema (reported by 5 of the 9 participants). Another distressing exercise-inhibiting problem for all of the women with breast and ovarian cancer was the vasomotor consequences of menopause. Associated with ongoing discomfort, embarrassment, fatigue and insomnia, vasomotor symptoms severely affected their global ability to function, as well as their motivation and ability to practice recommended dietary and exercise behaviors:

UR: It is awful ... at night time I'd be waking up. I lost count the number of times at night. Because I was always really cold in bed, snuggled up with bed socks and extra blankets, and suddenly the tables would be turned and I'm flinging back the bed clothes and then, as you sweat it cools and you get cold. I must have gone through I don't know how many months of hardly any sleep really because of constantly getting woken. And it's distressing during the day too because you're trying to concentrate.

Distress from the vasomotor symptoms of menopause did not emerge as a strong theme in the women treated for blood cancers. Whereas hormone therapy to offset menopausal symptoms is contraindicated in breast and ovarian cancers, the

women treated for hematological cancers were routinely prescribed hormone replacement therapy, which probably accounts for their comparative lack of menopausal symptom distress. Despite this, the hematological cancer cohort described less uptake of exercise than women treated for breast and ovarian cancer, and all of them rated their health as much poorer. The majority of the hematological cohort had received allogeneic stem cell or bone marrow transplant as part of their cancer treatment, and it was this procedure that triggered immunological changes that were often permanent and induced a range of moderate to severe long-term alterations in health status. Hence four of the hematological cancer participants acquired donor-related conditions such as asthma. Six of them described ongoing problems with graft-versus-host disease (GvHD), principally of the lungs, eyes and skin. One participant had GvHD in “every system” of her body, describing her skin changes as so severe that she could not lift her arms to hang out the washing, let alone exercise. Four participants were taking immunosuppressive therapy during the study and all reported recurrent and disabling infections as a result. One of these also described steroid-related avascular necrosis, which required bilateral hip and shoulder joint replacements. Other systemic effects of treatment were equally significant. Four blood cancer participants reported osteopenia or osteoporosis, which in one case resulted in a spinal crush fracture. Another had developed liver dysfunction secondary to the hemochromatosis that she attributed to multiple transfusions of blood products during treatment.

There were particular factors that predisposed the women to engage with cancer screening practices. Their perceptions of their genetic risk were significant amongst these. Ten of the 22 participants described a strong family history of

cancer; with four of the nine breast cancer participants offering a family history of breast cancer. Knowledge was another important predisposing factor in this cohort. All breast cancer participants were aware they could have a hereditary risk and this knowledge had invariably spurred their mammography screening practices both pre- and post-diagnosis. However they were not so well informed about the breast cancer treatment-related risk factors that also necessitate regular screening; and neither were those who had been treated for blood cancers. For example, half of the participants were not aware of the potential of their cancer treatment itself to subsequently induce different tumors such as skin and breast cancers; although prior chemotherapy was cited by one leukemia participant as the cause of her subsequent lung cancer and by two other blood cancer survivors as triggering their numerous squamous and basal cell carcinomas since treatment. Despite not usually knowing that chemotherapy can be implicated in the later development of skin cancers, all but one of the women reported that they were sun aware both pre- and post-diagnosis. The following comment from LD is typical of their exemplary sun protection practices:

It's the full Aussie burka I wear. You know, the long-sleeved shirt, the hat, the sunglasses, the scarf, the long pants, the sunscreen cream."

None of the blood cancer participants reported awareness of their risk of developing breast cancer after combined chemotherapy and chest irradiation, and none underwent regular screening for this. Other screening practices for the hematological cancer cohort elicited from the interviews – bone densitometry,

cervical smears and tumor markers – were always adhered to because the cancer treatment centre or cancer specialist followed this up annually after bone marrow transplant. This was not the case for any of the breast cancer cohort. Notably, all breast and ovarian interview participants indicated they had self-initiated the recommended breast checks or mammograms prior to diagnosis, and continued to do so once treatment was completed. Unlike the blood cancer cohort, they did not describe being routinely followed up in this respect by their oncologists or the treatment centre; and apart from self-initiating formal breast examinations, screening by general practitioners occurred on an *ad hoc* basis.

All participants were aware of the importance of diet and exercise in promoting their general health and bone density. The health behaviors they tried to practice reflected this knowledge despite ongoing problems with fatigue. Only one interview participant had smoked tobacco before diagnosis, and continued to smoke five per day. Participants were usually moderate with respect to alcohol consumption, with six not drinking it at all; however eight of the 22 participants regularly drank alcohol beyond the recommended two units per day. No interview participant was aware of the association of alcohol with post-menopausal breast cancer.

Green and Kreuter note that in the general scheme of things, people are not predisposed to engage in health behaviors because they wish to prolong their life (Green & Kreuter, 2005). They argue that health behavior tends to serve more immediate practical and sociocultural ends, as it obviously did for these women. Many interview threads made it apparent that participants' health behaviors were not only intended to make them live longer. Their dietary and exercise habits were

more aligned with their cultural beliefs, which stressed the importance of feeling, functioning or looking better for social and work purposes. So it is important to understand that where desirable health behaviors were evident or strived for by our participants, their post-treatment health practices were always consistent with their pre-diagnosis attitudes, beliefs or behaviors. In the following typical excerpt, Participant CW describes a pre-diagnosis exercise regimen she developed to help her cope with the demands of her small business. She discussed how she continued this regimen during chemotherapy treatment and continued to practice it post-treatment and up to the time of interview:

CW: I mean that weekend [after chemo] it was like just having a really bad hangover actually, you know for that 2 or 3 days and on Monday morning I was fine. I was ready to go again. [You need to] try and keep your life as normal as you possibly can, so I did. I didn't really change my routine at all. Physically I've always exercised my whole life. I've always played sport or done exercise, so going to the gym 5 days a week, or 6 days a week. That's my routine, and I get up every morning and I go to the gym. Before I went to the gym, because I've been going to the gym for about 5 years, I would get up and go for a walk. That's just part of me, I've always done it my whole life.

It could be that the pre- and post-treatment exercise, diet and sun-screening regimens to which they tried to adhere reflected not only a desire to prevent cancer recurrence—they could also reflect the normative imperatives that prevail in Anglocentric cultures like Australia. These norms valorize a slim and athletic female

form and a youthful complexion; emphasize exercise and other practices that result in individual actualization; and value an individual who is fit, healthy and economically-productive (Turner, 2008). When developing education programs for women treated for cancer, it might therefore be worthwhile identifying women who value these ideas. Programs could subsequently be tailored for them that align with their sociocultural motivations to practice healthy lifestyles. Targeted health strategies that are congruent with normative imperatives are more likely to succeed than strategies that are dissonant with societal or personal expectations.

### **Enabling Factors**

Enabling factors are the vehicles that make changes in health behavior possible. They are the skills, resources and barriers that can enhance or inhibit the implementation of desired health practices. Examples of enablers and inhibitors include the availability, accessibility and affordability of health and community resources, such as the supportive organizational structures that encourage timely follow-up. An example of individual skills is an understanding of how to use these resources.

One enabling factor that particularly stood out in this respect was the content, context, type and timing of education the participants received to prepare them for survivorship. In terms of content, while most participants stated that they had probably received education from their treating health professionals, very few of them had any memory of it. The education they could recall seemed to focus on more acute effects like hair loss and mucositis than preparation for longer-term outcomes. An educational omission reported by most of the women treated for

breast cancer (but not those treated for ovarian or blood cancers) was the likelihood of menopause, its symptoms and how they might be managed in the longer term. Other notable educational omissions recounted by many participants include health professionals' failure to explain their risks of developing heart failure, osteoporosis and memory deficits as a result of treatment; the importance of yearly mammograms, skin checks, pap smears and regular medical assessments once treatment ceased; and the need and rationale for good diet and exercise. Many of the participants reported practicing all of these things at the time of interview, but made it clear their behaviors in this respect had either been established prior to diagnosis or that their knowledge was picked up later at support groups or from their wider reading and internet searches. As one participant noted:

UR: I have nothing in writing to say to me "this is what you had. This is the cancer that we've treated. This is how we've treated it, with these drugs. This will be the outcome. This is how you should manage it". It's all in everybody else's office and I don't have that information.

It seems counter-intuitive that cancer health professionals, who care a great deal about their patients, should neglect such things. Perhaps they don't neglect them. It might have been the context that the education was delivered in: all of the participants commented how noisy and crowded chemotherapy units are, and such conditions are not conducive to the retention of future facts in women whose minds are focusing at the time on their immediate needs. The type of education also bears consideration. The participants all had different learning styles and nominated a

variety of ways they preferred their education delivered, ranging from individual face-to-face teaching by a nurse, to reading education pamphlets, to discussing survivor plans in support groups. They stated that the most effective education was tailored to their specific needs and to their unique learning styles. Finally, the timing of education is important. Overwhelmingly, participants did not report that education regarding survivorship should be given in the early- to mid-phases of cancer treatment. They described their focus during this period as very much on managing their acute side effects at a time when they were already overwhelmed with information. Rather, they stated a preference for survivorship education packaged into a tailored plan at the very end of treatment when, as Participant GJ noted, “you can actually retain what you are told”. Participant JD provided a typical response to this line of questioning:

JD: Not during treatment, you are too sick and tired and for the first couple of weeks and even after discharge I had issues with other things ... I guess I wasn't interested much at that time that this could happen or that could happen, because it may not. Even if they had of told me [then] I don't think it would have sunk in.

### **Reinforcing Factors**

Reinforcing factors within Precede are seen as the contextual supports and the positive or negative feedback individuals receive if they adopt a health practice. They influence the adoption of both beneficial and harmful behaviors. Examples of reinforcing factors include physical incentives, social and health professional

support, and peer influences. Physical incentives might include greater feelings of well-being and improved function; social incentives might arise from positive feedback from colleagues, family and health professionals with respect to productivity, appearance and achievement.

In terms of health service and social reinforcers in this study, participants reported easy access to services such as gyms and general practitioners; and with the exception of one participant, they described themselves as well-supported emotionally and socially. Given these findings, and the fact that post-discharge the participants had limited formal contact with the potential reinforcement provided by cancer-specific health professionals, one prime target for intervention in this group appears to be harnessing the formal and informal social support networks available to them. The emotional support offered by partners, close friends and particularly peers in dedicated support groups, who understand the impact that altered role expectations can have on cancer survivors and know how to accommodate it, was extremely important to this cohort. Peer support groups are important in another respect. All participants described undertaking constant self-surveillance with respect to their cancer, and the time and energy devoted to this seemed to result in tensions that needed outlet. Many meditated, or had taken up yoga or creative pursuits, but mostly it seemed to be the safe space offered by peers that did most to relieve the stress of constant vigilance and provide an emotional outlet for confronting thoughts about mortality or the outcomes of treatment, which were never far from the surface. One participant described why she joined a peer group to provide support for this issue whilst not avoiding the realities of her cancer:

LW: It brings a bit of stillness to my life and ... you can drop your defences around other people with cancer. One of the girls recently lost her sister. She has breast cancer and her sister has breast cancer ... and we were at the first brunch after this lady passed away ... she was crying. And we were comfortable with that, because we understand what it's like and ... if someone's dealing with something sad or somebody's crying or somebody's upset, we can deal with it. You don't have to feel uncomfortable about it. You know, you do get the support you need, because everyone's been upset at times, everyone's been down.

It should be noted that four of the 22 participants reported an aversion to a collective culture that LW called the "Cancer Club - the 'my cancer's bigger than your cancer' kind of thing". As KC noted "I would rather be with well people . . . I don't like the word 'survivor'. Because that's the point, I don't have it any more". Despite these drawbacks, the formal support groups offered by cancer organizations clearly played a significant role, and not just in offering emotional support. As noted in the section on enabling factors, they play an equally important part in the educational preparation of participants for survivorship.

## Discussion

In this study, where little was known about the phenomenon of interest in our health service area, we particularly appreciated the comprehensive approach afforded by the Precede element of this study framework and its participant-centered orientation, which allowed us to map and understand the complicated physical and psychosocial nature of the issues that contribute to the participants' health behaviors after cancer treatment. In light of the extensive amount of data that must be collected according to the Precede framework, however, studies like this are necessarily complex and in a single paper we can only report the qualitative component of our larger findings. In addition, this paper reports a subset of survey participants who also consented to interview – we do not know anything about the experiences of the women who did not wish to participate in the qualitative component of the study. As a result of these limitations we do not make any claims that these results are generalisable beyond the women interviewed; although these findings could resonate in similar groups of women.

As a result of the qualitative data collected in this project, we can better answer the 'why' questions in relation to this particular group of women; that is, the predisposing, enabling and reinforcing factors that so influence the health behaviors elicited in the survey data. The 'predisposing' demographic profile of this cohort encompasses a range of developmental, knowledge and post-treatment needs that warrant flexibility in interventional approach. There were, however, some commonalities that we will bear in mind when planning public health programs for this particular group. For example, the generally good diet and physical activity levels

embedded well before diagnosis, and the continuation of these behaviors after treatment in this sample, could be a result of their comparatively higher educational standard and socioeconomic status (Ashing-Giwa & Lim, 2009; Avis, Crawford, & Manuel, 2005; Boyes, 2009). It appears that younger survivors with a lower standard of education are particularly at increased risk of physical inactivity (Hong et al., 2007). The higher educational attainments of our sample means however that the level at which our interventions are targeted must be carefully considered, and their mostly full time occupations indicate that despite their appreciation of any form of health education or emotional scaffolding provided by peer support groups, the women might not be able to participate in them for prolonged periods.

In terms of 'enabling' factors in this study, it was evident that most of the women probably received some education about health risks and health behaviors during their active treatment period. Unfortunately, they did not appear to have retained it and, therefore, they often denied that they had received any education at all. Alternatively, they described it as fragmentary. However, they all expressed the belief that education is essential to their enabling process and described it as a significant unmet need—a need consistently echoed in the literature (Cappiello, Cunningham, Knobf, & Erdos, 2007; Schmid-Buchi, Halfens, Dassen, & van den Borne, 2008). To overcome this problem, the group supported the idea of individually-tailored education delivered by the nurses caring for them in the chemotherapy clinic.

The dynamic, highly individual and variable educational demands of cancer survivors elucidated by this group are also reported by others (Rees & Bath, 2001;

Rutten, Arora, Bakos, Aziz, & Rowland, 2005). A meaningful variable in this context is the age of participants (Beckjord et al., 2008; Vivar & McQueen, 2005). Research indicates that younger survivors have different educational needs compared to their older peers (Thewes, Butow, Girgis, & Pendlebury, 2004; Vivar & McQueen, 2005). For, example, younger women tend to seek more information and also base their search on a broader range of sources (Rutten, et al., 2005). Given that most education packages are standardized, it seems that individually-tailored information based on a thorough assessment of the education needs of these younger survivors is warranted.

Pedagogical factors were also considered relevant components of education by the group. Participants clearly favored a peer-delivered face-to-face educational approach. These suggestions are supported by research findings that favor oral presentation of timely and individually-gauged information delivered by peers (Campbell, Phaneuf, & Deane, 2004; Hoey, Ieropoli, White, & Jefford, 2008; Rees & Bath, 2000). Other studies indicate that such oral presentations should be followed by written summaries and must pay attention to differences in individual cognitive performance (McPherson, Higginson, & Hearn, 2001). Cognitive performance is an important issue in younger survivors who routinely deal with the short- and long-term cognitive alterations attendant on treatment-induced menopause.

In addition, when developing health promotion programs for our group, particular attention should be paid to the timing, context and content of the education as identified by each woman, preferably towards the end of treatment and beyond. That education will provide as standard, however, the rationale for

good diet, alcohol limitation, exercise and comprehensive medical screening in the longer-term, and ways to achieve these.

It also seems important to 'reinforce' education in the longer-term through peer and other social supports such as public health programs. The women stressed the importance of social support, which mostly referred to their partners and their families. The importance of this support from close relatives is identified within the literature as a considerable resource for reinforcement once a health behavior change is initiated (Mols, Vingerhoets, Coebergh, & van de Poll-Franse, 2005; Sammarco, 2009; Schmid-Buchi, et al., 2008; Thewes, Meiser, Rickard, & Friedlander, 2003). Another source of social reinforcement originated from the support groups run by community organizations. It is argued that such support groups are important because survivors increasingly feel abandoned after primary treatment (Vivar & McQueen, 2005). It should be borne in mind however that in this study, community cancer support groups were a source of reinforcement for some of the women whereas others did not perceive benefits from prolonged participation in them. However, given that support groups were identified as a reasonable source of some support by all who participated in this study, they might provide opportunities to systematically deliver aftercare information to a broader range of survivors at least at the beginning of their survivorship. Empowerment, social support and meeting the informational needs of survivors are other reinforcing properties support groups can provide (Adamsen & Rasmussen, 2001; Thewes, et al., 2004; Weis, 2003). In a health-system context in Australia that offers no structured pathway for survivorship, support that can be accessed on an 'as needed' basis in these types of

groups is probably important (Brennan, Butow, Spillane, & Boyle, 2008; Ganz & Hahn, 2008; Miller, 2008).

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